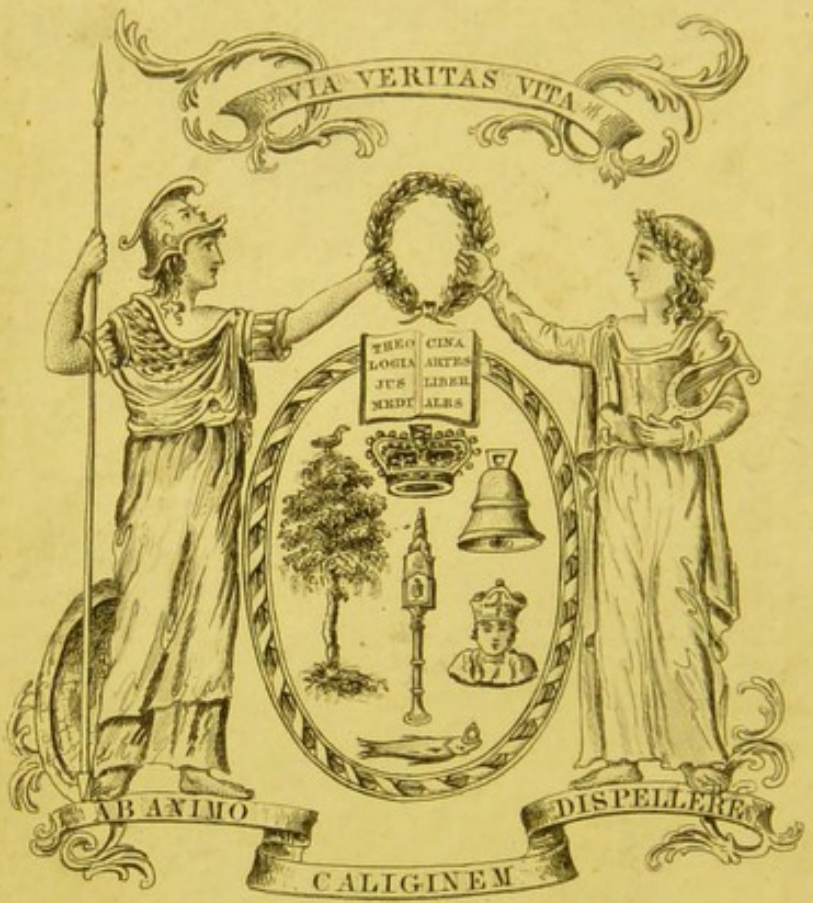
Introductory lectures to a course of military surgery, delivered in the University of Edinburgh / by George Ballingall.



INTRODUCTORY LECTURES

TO

A COURSE

OF

MILITARY SURGERY,

DELIVERED IN

THE UNIVERSITY OF EDINBURGH.

BY

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TO THOSE MEDICAL OFFICERS

OF THE ARMY, OF THE NAVY,

AND OF THE

HONBLE EAST INDIA COMPANY'S SERVICE,

WHO HAVE DONE THE AUTHOR

THE HONOUR OF ATTENDING HIS LECTURES,

THIS INTRODUCTORY DIVISION OF THE COURSE,

IS

RESPECTFULLY INSCRIBED.

PREFACE.

THE following Lectures are now printed, nearly as they have been delivered for a series of years in the University of Edinburgh; the illustrative extracts, however, are here in many instances given at greater length, as the author is desirous that his practical conclusions, on subjects of so much importance, should not rest solely on his personal observation, but should be confirmed by a reference to more experienced men. This consideration, it will be seen, has led him to make a very free use of the various sources of information within his reach, which he is far from being desirous to conceal; on the contrary, one of his chief objects in this publication is to point them

out to his pupils; but so much time has now elapsed since these Lectures were first sketched out, that the Author feels it impossible, however willing he may be, to appropriate accurately the *suum cuique*, or to distinguish with precision what is really his own from the mass for which he is indebted to others.

Much of the historical matter will be found in GROSE's Military Antiquities, AIKIN's Biographical Memoirs of Medicine, HUTCHISON's Biographia Medica, and BECKMANN's History of Inventions. To some of the periodical works of the day, and to the verbal and written communications of some of his professional friends, particularly of the late Dr. HENNEN and of Staff-Surgeon MARSHALL, the Author is deeply indebted. He would also take this opportunity of acknowledging the kindness of Sir JAMES M'GRIGOR, in giving him access to the valuable professional papers in the office of the Army Medical Department, and of Dr. THEODORE GORDON, in pointing out to him

what was most worthy of his attention in these papers; but of this kindness, he has availed himself more fully in some other divisions of the course than in this.

In imitation of the good practice introduced into this department of literature by Dr. Millingen, and subsequently followed by the Author's esteemed friend, Mr. Annesley, he has annexed a list of writers on subjects intimately connected with Military Surgery. For the completion of this list, as regards German Authors, in which department it is perhaps most perfect, he is greatly indebted to Dr. Russell, the son of his learned colleague the Professor of Clinical Surgery.

In conducting his course, the Author has, from the mixed nature of his audience, felt perhaps more than most of his colleagues the difficulty of steering a middle course between the omission of those important principles with which it is essential for every Student of this department to be imbued, and that superfluity of detail which would

prove intolerably irksome to those experienced Military and Naval Surgeons, with the presence of a large proportion of whom his Lectures have always been honoured.

Those who are disposed to look upon this publication with a favourable eye, will do the Author the justice to recollect that he has been the first in this country to attempt a separate and complete course of Lectures on Military Surgery; that he succeeded to the Chair after the termination of a long war, when the demand for this species of instruction was necessarily abridged, and when the spirit of the age was in a great measure adverse to such institutions. Those who are acquainted with the history of the Chair of Military Surgery, in this University, know also that it laboured, for long after its institution, under prejudices both of a political and of a professional nature. Of these, however, there is now no cause to complain. The encouragement which this Chair has recently received from the Senatus Academicus, and from the Royal Col-

lege of Surgeons, as well as the indication of a favourable feeling on the part of the Royal Commissioners for visiting the Scottish Universities, have placed the present Professor in a situation calling upon him for increased exertions.

The Author's principal object in committing these Lectures to the press, is to enable him to refer his Pupils, particularly those who are late in entering, to a concentrated view of the subjects embraced in this introductory division of the course, founded upon acknowledged principles, divested of technicalities which young men, strangers to the service, cannot possibly understand, and unincumbered with details which it is not only impossible to bear in mind, but which are liable to be varied from time to time, according to circumstances, or even to the caprice of individuals. He is also desirous, by the publication of these Lectures, to leave himself more unfettered, and to be enabled to devote an increased share of attention to subjects more strictly professional; particularly

to the consideration of Wounds and of those other accidents and diseases which form the great body of his course. In conclusion, he would avow a like motive to that which so worthily actuated one of his learned colleagues upon a similar occasion: he is desirous of proving to the public, and, above all, to that distinguished Statesman whose disinterested patronage placed him in the Chair he fills, that he has not been inattentive to the duties which it imposed upon him.

Edinburgh College,
December 25, 1829.

SYLLABUS

OF THE

COURSE OF LECTURES

ON

MILITARY SURGERY,

DELIVERED IN THE UNIVERSITY OF EDINBURGH.

Historical Notices of the principal Writers on this subject.—General Observations on the Means of Preserving the Health of Soldiers and Seamen.—Examination of Recruits.—Diet; Clothing; and Exercise of Troops.—Accommodation of Troops; in Camp; in Barracks; in Billets.—Site, Construction, and Ventilation of Hospitals.—Economy and Discipline of Military Hospitals.—Means of transporting Sick and

Wounded, illustrated by Models and Plans of the Principal Contrivances for this purpose.

Surgical Diseases, and accidents incident to Troops.—General Observation on Inflammation, as connected with those Injuries to which Soldiers and Seamen are more peculiarly exposed; Causes, Symptoms, Terminations, and Treatment of Inflammation.

Burns—from Solid Bodies; from Fluids; from Explosions of Gunpowder; Constitutional Treatment; Local applications.

Ulcers—recent; chronic; irritable; indolent; varicose—Specific ulcers; venereal; scorbutic. —Constitutional treatment; Local applications.

Hospital Gangrene.—Occasional ravages of this Disease in Military and Naval Hospitals; in the Artillery Hospital at Woolwich; in the Military Hospitals at Passage and at Bilboa; in the Naval Hospital at Yarmouth.—Treatment.

Wounds, General Observations on.—Hæmorrhage and means of restraining it; Compression, of the Bleeding Vessels, of the Trunks supplying them; Styptics; Cautery; Ligature.—Aneurism; Spontaneous; from Wounds; False, Varicose.—Injuries of Nerves; Anomalous

symptoms arising from; Paralysis; Tetanus, and its various modifications.—Incised, Punctured, Lacerated and Contused Wounds.—Poisoned Wounds.—Gunshot Wounds.

Wounds of the Head.—Fractures of the Cranium, Simple and Compound; Injuries of the Brain and Lodgment of foreign bodies within the Cranium.

Wounds, Fractures, and Injuries of the Spine.

Wounds of the Face and Neck; of the Parotid Duct, of the Trachea, of the Œsophagus.

Wounds of the Thorax; of the Parietes; of the Thoracic viscera.—Emphysema.—Empyema.

Wounds of the Abdomen; of the Parietes; of the fixed or Glandular Viscera of the Abdomen; of the floating or Tubular Viscera of the Abdomen.—Hernia.

Wounds of the Extremities; Injuries of the Joints, particularly those from Sabre and Gunshot wounds.

Fractures of the Limbs, Simple and Compound; Gunshot Fractures.—Diseases of the Bones.—Caries.—Necrosis.

Luxations.

Amputation.—Historical Notices of the successive improvements in this operation.—Circumstances demanding it.—Judgment upon this

point influenced by the peculiar circumstances in which Soldiers and Seamen are occasionally placed.—Comparative Statements of the success of Primary and Secondary Amputations; Different forms of operating in the Removal of Limbs, particularly at the larger Joints.

Ophthalmia; Frequency of this Disease in the British Army since the Egyptian Campaign.—Question of its contagious nature.—Artificial means employed to produce Ophthalmia.—Means of distinguishing the artificial from the natural Disease.—Treatment of Ophthalmia.—Occasional Sequelæ of this Disease; Ulceration and Opacity of the Cornea; Closure of the Pupil; Granular state of the lining membrane of the Palpebræ.

Syphilis; Local, and Constitutional Symptoms.—Primary Sores, and Glandular swellings.—Ulcerations of the Throat.—Eruptions on the Skin.—Nodes.—Treatment.—Important investigation instituted in the Military Hospitals relative to the treatment of this disease.—Results of that investigation.

Gonorrhœa and its consequences.—Hernia Humoralis.—Strictures.

Fictitious Diseases, and means of detecting them.—References to the many valuable obser-

vations lately published upon this subject. By Dr. Hennen; Mr. C. Hutchison; Dr. Cheyne; and Staff-Surgeon Marshall.

Conclusion of this Division of the Course, with some Remarks on Military Punishments.

Diseases incident to Troops on Foreign Stations, particularly in Tropical Climates.—Diseases of the West India Islands.—Yellow Fever, the great source of Mortality amongst the Troops in the West Indies.—Diseases of the East Indies.—Dysentery, the principal source of Mortality amongst the European Troops in that quarter.—Hepatitis.—Cholera.

The Lectures are delivered on Mondays, Wednesdays, *and* Fridays, *at Two o'clock; and the Surgical operations are exhibited on the Dead Body during the Course.*

Medical Officers of the Army, Navy, Ordnance, and Honourable East India Company's Service, are furnished with Tickets of Admission to these Lectures, gratuitously, on application to Dr. Ballingall.

LECTURE I.

GENTLEMEN,

SOON after the commencement of the late war, a Professorship of Military Surgery was instituted in this University, under the immediate patronage of the crown, with a view of adding to those opportunities of instruction of which gentlemen aspiring to medical commissions in the army or navy were called upon to avail themselves. Most of you are aware that this professorship was held for many years by one whose distinguished literary and professional talents are known wherever medical science extends; whose unwearied industry, directing itself to another department of the profession, made way for my succession to this chair, and made way also for

all that anxiety as to the conduct of my course which it was natural and becoming in a successor of Dr. Thomson to feel. This anxiety was naturally increased by the reflection that a long and distant seclusion from academical institutions had deprived me of that access to the records of our profession, which might have enabled me, in some respects, to do more justice to my subject; I am, nevertheless, encouraged by the hope, that many of the best years of my life passed in an intimate acquaintance with sick and wounded soldiers, in the study of their habits, and in the treatment of their diseases, may enable me to lay before you some practical information on those points with which young men destined for the public service are more peculiarly called upon to make themselves acquainted.

I proceed under the impression that the department allotted to me in this great medical school is a department of all others the most purely practical. Military surgery, as it now exists, is so essentially the creation of the late war; its principles have been so fully established, and its future practice must be so much influenced by the experience acquired in the recent campaigns, that no great nor extended research can be necessary to enable me to lay before you such

information as may qualify you to practise military surgery with credit to yourselves, with benefit to your sick and wounded comrades, and with advantage to the state. In addresses of this nature it is not unusual to enlarge upon the importance of the science to which the pupil's attention is to be directed, but, on the present occasion, little of this nature will be required. A few observations, however, on the peculiarities which distinguish military surgery as a separate branch of study may not be misplaced.

You are all, Gentlemen, well aware of the great and leading division of the healing art into medicine and surgery, a division which has existed from a very ancient date, and which it seems to be the prevailing desire of the present day to abolish. Of this abolition, so far as regards professional education, no man can more heartily approve than I do: when the principles of our science are to be taught, I am not disposed to circumscribe the views of the teacher by artificial or arbitrary limits, nor do I know of what principles whether of physic or of surgery the student of either department can well remain ignorant. My views upon this point, however, do not go so far as those of some of my cotemporaries; they do not extend so far as to abolish all distinctions in

the wide field of practice, nor to induce me to concur in a wish for the junction of our colleges of physicians and surgeons. Here I cannot express my sentiments better than in the words of a late Naval surgeon, a distinguished member of that college to which I belong, a man of whom I have often said that, of the numerous professional men with whom I have had occasion to consult, he afforded the best example of that due and well proportioned mixture of practical tact with scientific knowledge which is calculated to enhance the value of a medical man. Dr. Kellie, in a letter to my colleague Professor Russell, observes, "My professional principles, if I may so speak, are, perhaps, somewhat more aristocratic than those of many of my friends; I am convinced that, when the numbers and the wealth of any given population admit of the necessary division of labour, medicine and surgery should be kept as distinct and separate as possible." These were Dr. Kellie's words when writing in favour of an extended and comprehensive professional education, of which no man better knew the value.

A superiority in the province either of physic or of surgery must, in a great measure, result from a knowledge of the same principles. Yet at

the same time each of them will probably be carried farther when separately patronised by different institutions, and practised by different individuals. This, indeed, seems to accord with the decisions of experience; for of those who have arrived at singular eminence in either of these arts, few have chosen to invade the province of the other. "Cheselden did not prescribe in a fever, nor did Radcliffe undertake an amputation."

But if there is any one position in which it is more impossible than in another to follow out this division of labour, it is in the position of an army surgeon; you will readily understand how inexpedient, how impossible it would be to have our armies furnished with a host of followers in the shape of physicians, surgeons, accoucheurs, dentists, oculists, and aurists, calculated, in times of difficulty, to increase all the privations of an army, and leading, in the day of battle, to inextricable confusion. You will immediately hear of the multiplicity of offices which Paré undertook to save a wounded soldier, and you will readily see that of all professional men the military surgeon must be a man fertile in expedients, armed at all points, ready, as it were, with one hand to prescribe for a fever, and with the other to amputate a limb.

It is not, however, in this combination of the two great branches of the profession that the essence of military surgery consists, but in the peculiarity of the circumstances in which they fall to be exercised; and it is not perhaps more in the surgical than in the medical division of the subject that this peculiarity exists; at the same time it is by no means unnatural that the art and its professors should have taken their designation from that branch of it which, upon all great and momentous occasions constitutes its most distinctive feature. It is not a separate science, nor even a particular branch of the art of healing, but a judicious application of all the subdivisions of this art to those varied circumstances in which soldiers are placed both in health and in sickness. "Ce n'est pas toutefois une science distincte, ni même une branche particulière de l'art de guérir, mais une application raisonnée de toutes les parties de cet art aux circonstances variées dans lesquelles se trouvent les hommes de guerre, tant en santé qu'en maladie."

This simple explanation will, I think, go far to obviate some of the objections which are occasionally made to military surgery as a separate branch of study. I have sometimes been tempted to think, from the tenor of their observations,

that surgeons in civil life were fearful of being thought incompetent to the treatment of wounds, the amputation of limbs, and the management of other complaints which fall to be treated, if not more judiciously, at least more frequently, by the military surgeon. It is not enough for those who have passed, it may be, an honourable and a useful life in the practice of domestic surgery to exclaim, "Is the arm of the hero of the age, or are the arms of his heroic followers, of a different anatomical mould from the limbs of him who guides the plough?" No military surgeon will say, in reply, that he ever dreamt of such a distinction; but he will say with truth, that the arm of his country's champion is subject to a thousand accidents of a kind scarcely known to the ploughman or the labourer; he will say that these accidents fall to be treated in circumstances totally unknown to the tranquillity of a rural life; and he will say that these accidents fall occasionally to be treated in climates and on soils where a plough is not yet known.

Objections such as that to which I have just alluded come only from one quarter,—come without exception (so far as I have observed) from those who have not personally enjoyed the opportunity of comparing the practice of

surgery in military and in civil life. "Tous ceux qui ont pratiqué la médecine aux armées, ont observé que son exercice y présente des difficultés et des différences trés-remarquables, soit à cause de la nature et de la gravité des affections qui attaquent les soldats, ou des complications qui surviennent dans les camps et dans les hôpitaux, soit parce que la pratique médicale aux armées est entourée de nombreux obstacles, et soumise à des conditions particulières qui la font différer de la médecine pratiqué dans l'ordre civil. C'est pour cela qu' indépendamment des connaissances théoriques et pratiques nécessaires à tout médecin, celui qui se destine au service des troupes doit avoir des notions particulières et positives sur l'ètat du soldat, sur son genre de vie, ses exercices, ses habitudes, sur les causes nombreuses des maladies qui l'assiègent, et sur les situations extraordinaires auxquelles il est exposé, surtout en temps de guerre." No one, I maintain, can successfully combat the diseases of soldiers and seamen until he has studied their habits, learned their ways of thinking, and acquired a knowledge even of their prejudices. Upon this point I appeal with confidence to the experience of all countries and of all ages; I appeal to the most learned men who have ever entered into the service of their country; I appeal to

every medical officer of the army from the Director-General to the youngest Hospital-Mate. Let any one of them lay his hand upon his heart and say that, with the best education which the schools afford, he has not felt many difficulties when he first entered upon the duties of the garrison, of the camp, and of the field.

I will not at present refer to those distinguished military surgeons whose names and whose works will fall to be mentioned in the sequel; but I refer with confidence to the opinion of one who, after having been educated in the dissecting-room, and practised in a large civil hospital; who, after being fraught with every information which could grace a practitioner and a teacher, introduced himself into a great field of naval surgery, plunged at once *in medias res*; and who seeing, we may presume, that he had yet something to learn, returned home to urge upon the government the formation of a national school of military and naval surgery.

The late Mr. John Bell, after having visited the Naval Hospital at Yarmouth, and witnessed the treatment of the seamen wounded in the battle of Camperdown, addressed a Memoir to Earl Spencer, then First Lord of the Admiralty, in which he has laid down an inimitable code for the conduct of a course of military surgery.

"I. The Professor," says Mr. Bell, "must teach with perfect care the essentials of anatomy; the great principles of surgery he must found upon dissections; and all the great operations, all the accidents which each part of the body is liable to, all kinds of wounds must be fully explained."

"II. These general principles of the science must next be applied to the peculiar duties of the military surgeon; the professor must teach carefully the peculiar nature of gunshot wounds."

"III. He must deliver a short code of military medicine, explaining the fevers, fluxes, spasms, infectious diseases, and all the peculiar duties of the camp and the hospital; he must also explain the scurvy, ulcers, and all the disorders most frequent in ships of war."

"IV. He must teach medical geography; the climates, seasons, coasts of various countries; the manner of conducting soldiers on a foreign expedition; the general care of their health; the choice of encampments; the forming of hospitals on shore; how to convert churches, garrisons, public buildings, into occasional hospitals; how to attend an army in the field; how to lay the wounded in besieged towns; how to carry them off the field in a retreating army."

"V. Along with these must be taught military economics, diet, exercise, clothing, general medicine, and all methods of preventing disease."

"Without this knowledge," says he, "no man is entitled to serve. How few are thus taught? How few are fit for service? How few are there who are not conscious of those blurs and blots in their general education, which no diligence of their own can ever do away?"

Although I had delivered four courses of lectures before I ever saw the memoir from which the foregoing extract is made, I refer to it with great pleasure, because I believe it to have paved the way for the foundation of the chair which I have now the honour to fill. It reminds me of every thing which I have hitherto done, and of much of what I hope hereafter to accomplish. It coincides entirely with my conception of the duties incumbent on a professor of military surgery. It contains an enumeration of those topics which I have ever held it my duty to teach; and, while I deny the plagiarism, be assured, Gentlemen, that I feel proud of the coincidence.

I have been induced upon the present occasion to go into this, perhaps superfluous, detail, from a consideration of the new position in which the class of military surgery in this uni-

versity has been placed, by the recent enactments of the Senatus Academicus, and of the Royal College of Surgeons. While the chair enjoyed no official patronage from either of these bodies, I was more indifferent to the opinions entertained of it; I was sensible that it must work its way to public consideration and respect solely by the proofs which were given of its utility. I have hitherto felt myself, in a great measure, an irresponsible agent in the conduct of my course; but now that the class of military surgery has found a place in the *Statuta Solennia* of the University, and in the code of the College of Surgeons, I feel myself laid under a load of responsibility to my learned colleagues in these two bodies, and feel myself called upon to vindicate, in the public eye, that encouragement which they have been pleased to extend to this chair,—an encouragement with which I am the more gratified, because it has been given after mature deliberation,—not at my solicitation, but upon the showing of others. Let it be my business to correct, if possible, the vague, indefinite, and limited notions upon the nature of military surgery, which I find to prevail, even amongst the best informed of my brethren in the civil department of the profession. By some I am told

that military surgery comprises nothing but what every practical surgeon knows, and every professor of surgery is bound to teach. Others, again, I find limit their ideas of a course of military surgery to the doctrine of gunshot wounds. Now, Gentlemen, I shall consider my time to be very much mispent, if I do not convince you before the termination of the course, that both these opinions are erroneous, or, at least, that both are in extreme.

Of the numerous inducements which are held out to the study of surgery in general, none are perhaps more striking, than those arising from its obvious importance to military men. "We must," says Dionis, "allow the necessity of chirurgery, which daily raises many persons from the brink of the grave. How many men has it cured in the army? How many great commanders would have died of their ghastly wounds without its assistance? Chirurgery triumphs in armies and in sieges. 'Tis there that its empire is owned; 'tis there that its effects, and not words, express its eulogium."

Without at all adverting to its collateral relations, the application of our art to the objects of its attention is so immediate and direct, and the experience acquired in its exercise, is so obviously applicable to the wants of humanity at

large, that no effort of eloquence can be necessary to point out how much is to be gained by a zealous and devoted attention to the study of this department of medicine, and how much may be lost by neglecting those opportunities which its practice affords, for acquiring every information useful to the accomplished physician, or necessary to the practical surgeon.

I scarcely deem it requisite, Gentlemen, to call to your recollection the many occasions which occur in military practice, of displaying to advantage that skill and humanity, that presence of mind and dexterity, which it ought to be the aim and the object of every member of our profession to attain. To see the anxiety with which soldiers often look to their surgeon, when writhing under a painful wound, or struggling with disease under a tropical sun; to see the solicitude with which they are often watched by their comrades, and the anxious inquiries frequently made for them by their officers, must rouse our every effort to justify that confidence which I have ever found them ready to repose in us and in our art. Did I consider more selfish motives necessary to enlist your best efforts in the cause of the wounded and the dying, I might dwell upon the probability of your acquiring the interest and good offices of those high in command, and thus ac-

celerating your own promotion by a zealous devotion to the duties of your department; but I feel that upon this point it would be ungracious and unnecessary to enlarge; every exertion will flow most gracefully from a high sense of duty, and will be most honourably due to extended feelings of benevolence.

In adverting to the branches of information which those destined for the medical service of the state ought especially to cultivate, while I would exclude no one of those deemed essential to the most accomplished medical education, I would particularly inculcate the paramount importance of strict and accurate anatomical knowledge; the endless variety of accidents to which military men are exposed, the manner in which these accidents affect the blood-vessels, nerves and lymphatics; the bones, muscles, ligaments, and joints; the secretary glands and ducts; with the vital organs contained in the great cavities, evince the absolute necessity of our forming an intimate acquaintance with anatomy; and much is it to be regretted that so many obstacles should be opposed to the cultivation of this department of science. But in proportion as the opportunities of prosecuting this subject become more circumscribed, we

ought to embrace with more ardour those which do occur, and in the course of your service as military surgeons, you will find, perhaps, the most abundant of all fields for cultivating and extending your anatomical knowledge, both of healthy and of morbid structure. It is not, however, to be supposed that soldiers are altogether exempted from those feelings of aversion with which the dissection of the dead is generally contemplated; but if you can make it appear, (as I have always had the good fortune to do,) that the task is undertaken with the view of enlightening yourselves for the benefit of others, and that every indelicacy to the remains of an old soldier is scrupulously avoided, you will meet with no opposition to your inquiries. Think how much eclât you may gain, how much real satisfaction you may enjoy, by possessing that knowledge of anatomy which enables you instantly to secure an important wounded artery; think, on the other hand, what disgrace you may incur, what bitter reflections you may insure to yourselves, by finding that an incompetent knowledge of anatomy on your part has led to the loss of a gallant and distinguished soldier, perhaps of a brave and experienced general, and I feel that nothing more can be necessary to induce you to

cultivate those opportunities for anatomical and pathological research, which the public service so abundantly and so readily affords.

The value of these opportunities, and the advantages which they give to a surgeon, at that period of his career, when tired of the toils and perils of a soldier's life, he begins to entertain the wish of establishing himself in private practice, and becomes ambitious of securing a share of the confidence of those fellow-citizens amongst whom he is to end his days, were well appreciated and beautifully illustrated by our townsman, the late Mr. John Bell, a man who entertained the most dignified and exalted ideas of the importance of our profession, and practised its duties with a dexterity and eclât which have never been surpassed. "I have been accustomed," says Mr. Bell, "to regard the public service of the state as a great school of practical science, as offering opportunities which more than compensate the toils, the hardships, and the dangers of that way of life. It is a school where a young man, after a respectable education, is sure, while he improves in his profession, to acquire liberal principles, polite manners, and a knowledge of human nature. The situation of a military surgeon is more important

than that of any other; while yet a young man, he has the safety of thousands committed to him in the most perilous situations, in unhealthy climates, and in the midst of danger. He is to act alone and unassisted, in cases where decision and perfect knowledge are required; in wounds of the most desperate nature, more serious than can be imagined, and to which all parts of the body are equally exposed; his duties, difficult at all times, are often to be performed amidst the hurry, confusion, cries, and horrors of battle. Even in times of the greatest difficulty, cold and heat, hunger and fatigue, vexation of mind, and all the distresses of foreign service aggravate disease; and, while they render his exertions of so much importance, teach him imperiously the necessity of an accurate and ready knowledge of his profession. It is to him that his fellow-soldiers look up at the moments of distress; his charities and his friendships are prized above all price! What part of education is there needful, or even ornamental, for the surgeon living at his ease in some rich luxurious city, which the military surgeon does not require? What qualifications of the head or of the heart? He has no one to consult with in the moment in which the lives of numbers are determined! He has no

support but the remembrance of faithful studies, and his inward consciousness of knowledge; nor any thing to encourage him in the many humble yet becoming duties which he has to fulfil, except his own honest principles and good feelings."

"I know, (Mr. Bell elsewhere observes,) your minds go willingly along with me, when I speak of those duties which agree so well with the ardent and generous temper of youth. While you are young enter into the service of your country! it is a school of practice in your profession, of prudence, good conduct, and knowledge in the ways of the world. A young man ripens amidst those actual services for the important period, (to himself at least most important,) when he is to take his permanent situation in life; it is a school where he who has a good education, and just principles, improves in all that can make him beloved or respected when he returns home to his friends."

In the rapid sketch which I am now about to lay before you, of the progress of military surgery, I shall not follow those ingenious and speculative men, who, in delineating the history of their favourite pursuits, have endeavoured to find traces of almost every profession in the sacred

records of Christianity; neither would it serve you, in the present day, to dwell upon the multifarious accomplishments of the ancient Greeks, some of whom united in one person the qualifications of the soldier and the surgeon, alternately figuring as hero, or performing the functions of the healing art. Without wandering far into the recesses of antiquity, or losing ourselves in the regions of conjecture, we may safely conclude, "That military surgery (rude and imperfect though it may have been,) if not the very first, was at least among the earliest of the arts, which the follies and infirmities of mankind forced them to cultivate." The invention of gunpowder, and its employment in battle, produced many essential changes in the features of war. Of the consternation it occasioned amongst the troops, we may form some idea from the following relation, extracted from Monro's account of his expedition, with the worthy Scots regiment, called M'Kay's regiment, levied in August 1626. Speaking of the invention of artillery, he observes, "it is thought the invention of cannon was first found at Nurenberg, for the ruin of man; being at first, for a long time, used for battering down of walles and cities, and for counter-batteries, till at last they were used in the field to break

the squadrons and battailes of horse and foot; some carrying pieces called spingards, of four foote and a halfe long, that shot many bullets at once no greater than walnuts; and how soon the trumpet did sounde, the enemy were thundered on, first with these as with shoures of hailstone, so that the enemies were cruelly affrighted with them, men of valour being suddenly taken away, who before were wont to fight valiantly and long with the sword and launce, more for the honour of victory than for any desire of shedding of bloud; but now men are martyrised and cut downe at more than half a mile of distance, by those furious and thundering engines of great cannon, that sometimes shoote fiery bullets able to burne whole cities, castles, houses, or bridges, where they chance to fall; and if they happen to light within walles or amongst a brigadd of foote or horse, as they did at Leipsigh on the grave Von Torne his brigadd, they spoil a number at once, as, doubtlesse, the devilish invention did within Walestine."

Of the murderous effects of cannon and grape-shot, so pathetically described by Monro, none were more appalling, or led to more individual distress, than the new species of wounds presented to the view of the army surgeons. The

poisonous nature of the ingredients composing the powder, or of the balls projected by it, immediately became the chief subjects of their theoretical disquisitions, while their practice, in the first instance, was mostly confined to prayers, charms, and incantations; these were superseded by a farrago of incongruous applications which have gradually been exchanged for the simple practice of our own times.

In proceeding with my enumeration of military surgical writers, I shall confine myself chiefly to the notice of some of those meritorious individuals, who, after spending a portion of their lives in an irksome attendance upon the armies, have left behind them, in their writings, proofs of a professional enthusiasm and devotion to the service of their kings, princes, and generals, which carried them through inconceivable toils and privations, in many instances rewarded only by a pittance, which, in the present day, would be spurned at by the lowest menial attached to the profession.

Amongst the earlier writers on military surgery, I mention, with respect, the name of Ambrose Paré, who was successively surgeon to four kings of France, and who followed the French armies in all their campaigns from 1536

down to the battle of Moncontour in 1569. In his writings, which were collected and published by Guillemau, at Paris, in 1582, we have a wretched picture of the state in which Paré found military surgery at the time he entered the service; and to him we are indebted for many substantial improvements in its practice. He it was who first banished from surgery the celebrated oleum catulorum; an oil prepared by the boiling of live whelps, and reckoned a sovereign remedy for gunshot wounds. To Paré, also, we are indebted for the introduction of the needle and ligature, an improvement in the art of surgery, for which the name of its inventor will ever be respected. Paré's humanity would appear, from the following anecdote, to have been equal to his skill; "A party had gone out to attack a church (where the peasants of the country had fortified themselves,) hoping to get some booty of provisions, but they came back very soundly beaten; and one especially, a captain-lieutenant of the company of the Duke de Rohan, returned with seven gashes on his head, the least of which penetrated through both tables of the skull, besides four sabre wounds in the arm, and one across the shoulder, which divided one half of the shoulder blade. When he was brought to quarters, his

master, the Duke, judged him to be so desperately wounded, that he absolutely proposed (as they were to march by day-light) to dig a ditch for him, and throw him into it, saying, that it was as well that the peasants should finish him. But being moved with pity, I told him, says Paré, that the captain might yet be cured; many gentlemen of the company joined with me in begging that he might be allowed to go along with the baggage, since I was willing to dress and cure him. This was, accordingly, granted; I dressed him, put him into a small well covered bed, in a cart drawn by one horse. I was at once physician, surgeon, apothecary, and cook to him, and, thank God, I did cure him in the end to the admiration of all the troops; and out of the first booty, the men at arms gave me a crown a piece, and the archers half-a-crown each." It was actions like this which brough Paré into so much repute amongst the French soldiery, that we find their princes and generals willingly took the field when they could prevail upon Paré to go out along with them; and at the time when all the noblesse of the kingdom were shut up in Mentz, which was besieged by Charles V. in person, at the head of a hundred thousand men, they sent an embassy to the king their master,

beseeching him to send Paré to them. An Italian captain, for a great reward, introduced him into the city; they instantly sent, at midnight, to awaken the prince who commanded the garrison with the good news of his arrival. The governor begged of him that he would go next day and show himself on the breach. He was received by the soldiers with shouts of triumph. We shall not die even although wounded,—Paré is amongst us! Mentz was at this time the bulwark of France, and it has always been ascribed to the presence of this single man that they kept the city till the gallant army which lay around it, perished beneath its walls.

While Paré was thus gaining the unbounded confidence of the French soldiery, Thomas Gale was following the fortunes of the army of England. This distinguished military surgeon was born in 1507, and educated under Richard Ferris, afterwards serjeant-surgeon to Queen Elizabeth. Gale served in the army of King Henry VIII. at Montrieul, in 1544, afterwards in that of King Philip, at St. Quintin, in 1557, and latterly settled as a surgeon in London, where he became eminent in the practice of his profession. His works were published in 1563, and, amongst other surgical writings, contain a "Treatise on

Gunshot Wounds," designed chiefly to confute the error of Jerome of Brunswick, John de Vigo, Alphonsus Ferrius, and others, in supposing these wounds to be of a venomous nature. He also takes pains to prove that the bullet does not acquire such a heat, in its motion, as to render its wound similar to a cautery, which was then the common opinion ; thence he adopts a milder method of dressing these wounds, directing his endeavours to the procuring a laudable digestion, and in all respects considering them as common contusions. A subsequent volume of this surgeon's works is dated in 1566. The two first pieces it contains are " A Brief Declaration of the Worthy Art of Medicine," and " the Office of a Chirurgeon." The chief object of these tracts is to give a general history of the healing art, and to inculcate the necessity of a scientific method of study in attaining it. Numerous complaints of the intrusion of illiterate pretenders and empirics into the practice of medicine and surgery are interspersed through these pieces ; some of which are worth notice, containing curious information of the state of the profession at the time. Of the deplorable condition of military practice in his day we may judge from the following relation, " I remember," says he,

" when I was in the wars at Muttrel, in the time of that most famous prince, King Henry VIII., there was a great rabblement there that took upon them to be surgeons. Some were sow-gelders, and horse-gelders, with tinkers and cobblers. This noble sect did such great cures that they got themselves a perpetual name, for like as Thessalus's sect were called Thessalians, so was this rabblement, for their notorious cures, called dog-leeches; for in two dressings they did commonly make their cures whole and sound for ever, so that they neither felt heat nor cold, nor no manner of pain after. But when the Duke of Norfolk, who was then general, understood how the people did die, and that of small wounds, he sent for me and certain other surgeons, commanding us to make search how these men came to their death, whether it were by the grievousness of their wounds, or by the lack of knowledge of the surgeons; and we, according to our commandment, made search through all the camp, and found many of the same good fellows, which took upon them the names of surgeons, not only the names, but the wages also. We asking of them whether they were surgeons or no; they said they were. We demanded with whom they were brought up: and they, with shameless

faces would answer, either with one cunning man or another who was dead. Then we demanded of them what chirurgery stuff they had to cure men withal: and they would shew us a pot or a box, which they had in a budget, wherein was such trumpery as they did use to grease horses' heels, and laid upon scabbed horses' backs; and others that were cobblers and tinkers, they used shoemakers' wax, with the rust of old pans, and made therewithal a noble salve, as they did term it. But in the end this worthy rabblement was committed to the Marshalsea, and threatened by the Duke's Grace to be hanged for their worthy deeds, except they would declare the truth what they were, and of what occupation, and in the end they did confess as I have declared to you before."

The next writer of note upon military surgery is William Clowes, who appears to have commenced the practice of his profession as a navy surgeon, as he mentions serving on board one of the Queen's ships, called the Aid, in 1570. He afterwards settled in London, was appointed surgeon to St. Bartholomew's and Christ's Hospitals, and was subsequently sent for, by letters, from the Earl of Leicester, general of the English forces in the Low Countries, to come and take

upon him the care of the wounded men, and thither he went in 1586, by command of the queen, together with William Godorus her serjeant-surgeon. His earliest publication entitled "A Brief and Necessary Treatise touching the Cure of the disease now called Lues Venerea," was first printed in 1585; here he laments the great frequency of the disease, and in proof of this states, that in the course of five years he had cured about a thousand venereal patients in St. Bartholomew's Hospital. The next and most important work of Clowes, is "A proved Practice for all young Chirurgeons, concerning burnings with gunpowder, and wounds made with gunshot, sword, halberd, pike, launce, or such other." In the treatment of gunshot wounds he adopts what has sometimes passed for a more recent improvement, the use of mild emollient dressings; and in the relation of several dangerous and complicated cases of this sort, shows himself a skilful practitioner; for the suppression of hæmorrhage after amputation, he employed buttons of an absorbent and mildly astringent powder, applied to the vessels, and sustained by bolsters of lint and tow, with strong compression. This, he says, never failed him, and though he was acquainted with the method of

drawing out and tying the arteries used by some French surgeons, he never practised it. The powder was his own invention, which he had previously communicated to some of his brethren, and now makes public. He speaks everywhere with great respect of his cotemporaries of the profession, both native and foreign, nor is he less severe upon empirical pretenders, many of whom, he laments, were entrusted to practise on board her majesty's ships, to the great detriment of the service.

In " A Discourse on the whole art of Chirurgery," written by Peter Lowe, in the form of a dialogue between himself and his son, and dedicated to James Hamilton, earl of Abercorn, we find that Scotland has the honour of being the author's birthplace. He acquaints his readers that he had practised two and twenty years in France and in Flanders, had been two years surgeon-major to the Spanish regiment at Paris; and had followed his master, Henry IV. of France in his wars, six years. In the title page of his book he calls himself Doctor in the faculty of surgery at Paris, and ordinary surgeon to the king of France and Navarre. His work is dated from his house in Glasgow, Dec. 20th, 1612. How long he had been settled there does not ap-

pear, but he mentions that fourteen years before, on his complaining of the ignorant persons who intruded into the practice of surgery, the king of Scotland granted him a privilege under his privy seal, of examining all practitioners in surgery, in the western parts of the kingdom; and in virtue of this grant, the Faculty of Physicians and Surgeons of Glasgow, claiming to be the lineal offspring of Peter Lowe, is at this moment carrying on a lawsuit against that University, for the purpose of compelling those gentlemen who have obtained the degree of Master of Surgery from the University, to submit to a further examination before the Faculty, previous to their being licensed to practise in that district.

Lowe's work appears to have been sufficiently esteemed in its day, a fourth edition having been printed at London in 1654; and of the author's private character we have an amiable picture from a rude epitaph on his tombstone, in the cathedral church at Glasgow, quoted by the antiquary, Pennant.

About the year 1549, was born John Woodall, a distinguished military surgeon, and who, in that capacity, went over to France, in 1589, with the troops sent by queen Elizabeth to the assist-

ance of Henry IV. under Lord Willoughby. On his return to England, after a lapse of several years spent in travelling on the continent, he settled in London; became a member of the Surgeons Company about the year 1612; was elected Surgeon to St. Bartholomew's Hospital, and also surgeon-general to the East India Company. It is to be inferred from several circumstances, that he was employed some considerable time as a sea surgeon, and in that capacity made one or more voyages to the East Indies, but at what period of his life this happened cannot be ascertained from his writings. In 1626, when the naval forces of the kingdom were augmented, and warlike preparations were carried on with vigour, the charge of fitting out the chirurgical part of his majesty's service was committed to the Corporation of Surgeons, and by them to Woodall. The king, Charles I., on this occasion augmented the pay of the Navy Surgeons, and gave a bounty proportioned to the rates of the ships, towards furnishing the medicine chests. Among several other publications of Woodall, those more immediately connected with military and naval practice are his "Surgeon's Mate," the earliest of his productions, containing an enumeration of all the instruments,

utensils, and medicines of a surgeon's chest, with a brief description of their uses and qualities. His next work entitled "Viaticum, or Pathway to the Surgeon's Chest," was written in 1626, and published two years after. It is written with the same general design of instructing young practitioners, chiefly in reference to the treatment of gun-shot wounds, although under this head there is nothing materially different from what was given in his surgeon's mate. There is added, indeed, a description of the trephine, an instrument said to be the invention of our author, and which has, in this country, entirely superseded the use of the trepan. Woodall claims not only the merit of introducing a variation in the mode of working the instrument, but proposed also a conical shaped saw, calculated to prevent its sudden bearing on the dura mater, when the bone is cut through. The last of his works is a treatise on gangrene and sphacelus. Several useful remarks on amputation occur in this tract, and it seems to contain the first hint of amputating as low as the ancle in diseases of the foot. For having observed, in the East Indies, that persons who had undergone the punishment of having their feet cut off, were able to walk very well after the stumps were healed

by putting them into cases of bamboo, he expresses a wish that the practice might be imitated by surgeons, though he acknowledges that he himself should not venture upon such an innovation.

The next author whom I shall mention, demands your especial regard, whether you look upon him in his civil or his military capacity; I mean Richard Wiseman, serjeant-surgeon to king Charles II., who was bred amidst the horrors of our civil wars, serving a long and weary apprenticeship to that profession, in which at last he attained to an eminence, perhaps unequalled by any man since his time. Of his eight Chirurgical Treatises (my copy of which is dated in 1676,) one is expressly devoted to the consideration of gun-shot wounds; and in this, after adverting to the great contentions amongst the learned, about fire and venom in such wounds, he observes, "in these our later times, although they do not call them venomous, yet is it a difficult thing to dissuade many of our chirurgeons from dressing these wounds with the tincture of myrrh, and honey of roses, and thrusting in of great tents." Amongst many very remarkable cases and excellent precepts which Wiseman's work contains, he observes, "in heat of fight, whether it be at sea or land, the chir-

urgeon ought to consider, at the first dressing, what possibility there is of preserving the wounded member; and, accordingly, if there be no hopes of saving it, to make his amputation at that instant, while the patient is free of fever;" thus giving his testimony in favour of the practice of immediate amputation—a point to which we shall, in a subsequent part of the course, have particular occasion to advert; a point which has been the subject of much discussion during the late campaigns; and which discussion, after the lapse of a hundred and fifty years, has terminated in confirming the maxim so distinctly laid down by Wiseman.

Two years after the appearance of Wiseman's chirurgical treatises, "A complete Discourse on Wounds, both general and particular; as also, a Treatise on Gun-shot Wounds in general," was published at London, by John Brown, sworn chirurgeon in ordinary to King Charles II. This is a work of considerable learning, and is illustrated by a reference to the author's experience in the naval service, during the Dutch war of 1665, in which he was severely wounded.

From this period until 1744, we have no express treatise of any note on the subject of wounds, which I have hitherto been considering

as more particularly the province of military surgery. In this year was published a small treatise on the method of treating gun-shot wounds, by John Ranby, principal serjeant-surgeon to king George II.; another edition of which work appeared in 1760, containing the result of the author's observations while he had the honour of attending his majesty to the wars in Germany. "This work," says he, "was penned in a camp, and was intended to recommend plentiful bleeding very early in the treatment of gun-shot wounds, to advise likewise the application of light easy dressings to them, and particularly to introduce the signal use of the bark;" the two first were objects highly commendable; the last, in my opinion, Ranby might have omitted, without much detriment to mankind.

The next English writer who falls to be noticed, is one whose physiological and surgical talents have elicited so many compliments, that I find the language of panegyric quite exhausted in his praise. You will readily anticipate me in mentioning the name of John Hunter, whose imperishable work on "The Blood, Inflammation, and Gun-shot Wounds," was published in 1794, and contains observations drawn from the author's experience while serving as staff-surgeon

at Belleisle, and in Portugal; subsequent to which he was appointed surgeon-general to the army, and inspector of regimental infirmaries. Into farther particulars of his life I do not propose to enter. I could do it no manner of justice, within the limits necessarily assigned to this lecture; and to many of you it is probably already well known, through the medium of his brother-in-law, Sir Everard Home, who has published the life of this great man. Mr. Hunter's work above referred to, and his treatise on the venereal disease, (another subject peculiarly interesting to the military surgeon,) are so universally known, and so generally esteemed, that no observation of mine can enhance their importance; no encomium which I can bestow would in the least degree add to the respect with which you have, I trust, been accustomed to contemplate them—to the attention with which, I hope, you are disposed to study them.

From the date of Mr. Hunter's writings, until 1804, no work appeared on the subject of wounds, claiming any authority from the personal experience of its author. In this year was published "Chirurgical Institutes on Gun-shot Wounds," by St. John Neale, a work which (although the writer alludes to his personal experience during

the American war,) has never attracted any attention, having been always looked upon as a translation of Le Dran.

The conclusion of the war with France, in 1815, gave occasion to the appearance of two distinguished writers on military surgery, Mr. Guthrie and Dr. Hennen. Mr. Guthrie's work on gun-shot wounds of the extremities, requiring the different operations of amputation, was first published in 1815, and in 1820 a second edition of it, greatly enlarged and improved, appeared, under the title of "A Treatise on Gun-shot Wounds, on Injuries of Nerves, and on Wounds of the Extremities requiring amputation." Here he enters into the consideration of gun-shot wounds in general, and illustrates his doctrines by a reference to the most extensive experience which perhaps any of his countrymen ever enjoyed; the whole, as it now exists, forming a work which every one agrees in considering as a standard authority upon those points of which it treats. The nature and objects of Dr. Hennen's work, a third edition of which has just been published under the title of "Principles of Military Surgery," will be best understood from the elegant language of its author. "At the termination of a series of wars, which, for a large portion of

a century, have desolated the finest regions of the European world, and drenched their fields in blood, the medical philanthropist will naturally ask, what results have accrued from such ample sources of experience? What progress has been made in softening the miseries of pain and disease, and in extracting from such multitudes of victims antidotes to the waste of human life? The younger practitioner also who may enter the service of his country will inquire, where am I to collect the fruits of that experience with which so many campaigns have enriched my predecessors? and how, if the opportunities come within my reach, am I best to avail myself of them? It is in some degree, (says Dr. Hennen,) to answer these interrogatories that I have ventured to make the following observations. In arranging them I have carefully availed myself of the written and oral remarks of the best army surgeons, both domestic and foreign, to whose works and conversation I have had access, or who possessed more experience than myself. I have studiously avoided controversial discussions, when they could lead to no practical result; and theory, unsupported by experience, I have altogether rejected." Of Dr. Hennen and of Mr. Guthrie I am happy to

speak as of personal friends. I do not pretend, and I do not wish to speak of them without much partiality; this, however, Gentlemen, will not, I trust, deprive me of your confidence, when I represent their works as abounding in good sense, as fraught with excellent practical information, and as displaying throughout a decision, and an energy of professional character, peculiarly deserving of your imitation.

Dr. Thomson's report of the state of the wounded in Belgium, after the battle of Waterloo, was published here in 1816; in this you will find much information highly interesting to the military surgeon, and to his chapter on amputation, in particular, I shall have occasion to refer in a subsequent part of the course, as containing an admirable historical record of that operation. In the same year was published the first edition of a work entitled "Practical Observations on Surgery," by Mr. C. Hutchison, an experienced naval surgeon, who shortly after published some farther "observations on the proper period for amputating in Gun-shot Wounds." This contains a series of reports on the surgical cases after Lord Exmouth's naval action at Algiers, and is enriched with many valuable observations which entitle Mr. Hutchison to the same distinguished con-

sideration in the naval branch of the service which Guthrie and Hennen hold in the military department, and I have pleasure in ranking its author along with them in the list of my personal friends.

Mr. Samuel Cooper of London, and my late colleague, Mr. Allan of this city, although their observations have not been published in a separate form, but introduced into their systematic works on surgery, are entitled to a distinguished place amongst those who have given to the profession the fruits of their personal experience in the treatment of wounds.

At the head of numerous writers, who, although not military surgeons themselves, have yet given us many interesting observations on this branch of surgery, stands Mr. John Bell, whose discourses on wounds published here in 1795, contain much ingenious doctrine, and many excellent practical precepts. To his brother, Mr. Charles Bell, we are also indebted for some important observations on wounds. And here I must not omit to mention the ingenious little work of Mr. Chevalier on Gun-shot Wounds, published in 1804, and which had been distinguished the preceding year by obtaining the Jacksonian prize awarded by the Royal College of Surgeons of London.

In enumerating the writers on military sur-

gery, you will observe that I have hitherto confined myself almost exclusively to those of the English school. To have entered into anything like a circumstantial account of the writings of foreign authors, even if I possessed the most ample materials, would have carried me far beyond the bounds which I have necessarily assigned to myself in this preliminary detail; and, as I shall, in the progress of the course, have frequent occasion to refer to such authors, I shall take these opportunities of specifying particularly the titles of the works in which their observations are to be found. Amongst foreign writers, Germany boasts of Heister, Theden, Mursinna, Richter, and Schmucker; Italy may be proud of the names of Leonardus Botallus, Carcanus and Assilini; in the list of French writers on military medicine, numerous beyond that of any other country, the names of Petit, Le Dran, Fandaque, Ravaton, and Le Cat hold a conspicuous place, while the memoirs of the French Academy of Surgery teem with communications from various authors on subjects abundantly interesting to the military surgeon. At the commencement of the revolutionary war, Baron Percy published an excellent little work, under the title of Manuel de Chirurgien d'Armée, and

towards the close of that war, my distinguished friend, Baron Larrey communicated to the world in his "Memoires de Chirurgie Militaire," the results of his extensive experience in numerous campaigns.

Some of these foreign authors evince a practical acquaintance with the subject, superior perhaps to what has been shown by writers of a correspondent period in our own country, but whatever advantage they may have had to boast of at the beginning of the late arduous and protracted conflict, I am convinced, that before its termination, our surgeons were noways behind those of the enemy in skill, dexterity, judgment, or in any other qualification becoming an accomplished army surgeon. "The history of the last campaign has indeed proved that the French, to whom we were long accustomed to look for the rules of our profession, were not our superiors either in the field of battle, or in the skilful treatment of those who bled in that field."

But while we may please ourselves with the foregoing reflection, we must admit, that in the formation of schools of military surgery, and in the attention given by the state to the instruction of medical men for the service of the army, the French, the Prussians, and some other con-

tinental nations have gone far before us. Of this you will find, I think, abundant and useful proofs in the perusal of the Journal of Military Medicine, Surgery, and Pharmacy; and in a continuation of it, under the title of "Recueil des Memoires, de Medicine, de Chirurgie, et de Pharmacie Militaires," published at Paris, by order of the Secretary of State for the war department; a work now amounting to upwards of twenty octavo volumes, and from which I have quoted some passages in the commencement of this lecture. You will find in that work a notice of the establishment of Medical schools in the military hospitals at Metz, at Lisle and at Strasbourg, and you will find that it was in these hospitals that the system of clinical instruction, now so much approved of by all judicious teachers, was first made known to the medical youth of France.

I have now, Gentlemen, mentioned the most conspicuous names in the province of what may be more strictly termed military surgery, but were I to stop my enumeration here, I should lead you to form a very imperfect and erroneous opinion of the nature of the service, of the duties which devolve on a military medical officer, and

of the merits of many who have performed these duties with honour and success. The carnage, even in the great battle of Waterloo, an event sufficiently unique and distinguished to mark the age we live in, is in no long time equalled by the mortality amongst those brave men who are employed in protecting our foreign possessions, and it would be unpardonable in me to omit the mention of numerous authors who have written well upon the diseases to which our troops are exposed in these distant climates. I have yet said nothing of the writers on the diseases which afflict the soldier in camp and in garrison; in this list the names of Pringle, Brocklesby, Monro, and Cleghorn stand particularly conspicuous; amongst writers on the diseases more peculiarly incident to seamen, Lind, Blane and Trotter hold the most distinguished place; and from a numerous catalogue of writers upon tropical diseases, I would recommend to your particular attention the works of Hunter, Jackson, Bancroft, Chisholm, Curtis, Johnson, Annesley, and M'Grigor, the present enlightened Director-General of the medical department of the army, whose professional writings indeed form but a small portion of the debt of gratitude due to him by the public, and by the department

over which he presides. To some of the authorities just named, I shall have immediate occasion more particularly to advert in the introductory part of the course, which consists of general observations on those circumstances connected with the equipment, disposal, accommodation, and conveyance of troops, in which the medical officer is particularly interested. Here the best text-book I can recommend to you is Millingen's "Army Medical Officer's Manual," published in 1819. While discussing those surgical subjects which form the body of the course, I shall have constant occasion to refer to Hennen's "Principles of Military Surgery," Hutchison's "Observations on Military and Naval Surgery," and Guthrie's "Treatise on Gun-shot Wounds." In treating of these wounds, I expect that our labours during the present and future courses will be much facilitated by the liberal access afforded to a valuable collection of preparations, illustrative of this subject, in the museum of Mr. Charles Bell, lately purchased by the Royal College of Surgeons here. During the lectures on tropical diseases, with which I mean to conclude, Dr. Johnson's work on the "Influence of Tropical Climates on European Constitutions," Chisholm's "Manual of Tropical Diseases," and Annesley's

"Sketches of the Diseases of India," are the works which I should wish you to possess.

In conclusion, I beg to advert to the proud pre-eminence now occupied by military practitioners, in comparison to what they held in times by no means remote. Obscurity, poverty, and neglect, were long the portion of the army surgeon; and he must, indeed, have been possessed of a most glowing enthusiasm, and an utter contempt for self-interest, who would have buried his talents and his industry in such a situation. "The school (says an eminent writer) was always good, but the best and most natural feelings of the human heart were too deeply lacerated to permit any independent man to continue a pupil."

A brighter day has, however, dawned on military surgery; encouragement has been held out to active, enterprising, and well-educated men to embark in the public service, and the country has been repaid for its judicious liberality (tardy as it has been) by the acceptance of its offers. Of the opportunities afforded by the late war for improvements in military practice, particularly in the treatment of wounds, it is fortunate for the present and for future generations that surgeons have been found so amply

qualified, so eager, and so anxious to avail themselves. It is fortunate, also, that the enthusiasm which was kindled amongst the medical officers of the army and navy, during the recent conflict, has not evaporated with the occasion which gave it birth, and that in the present heads of the respective departments it has met with guides capable of giving that enthusiasm a proper direction and a salutary impulse. The institution of the Medical Museum and Library at Chatham, with the opportunities of instruction there offered to young men on entering the army; the institution of a similar Museum, and of a Clinical Lectureship, at Haslar Hospital, for the benefit of the naval branch of the service, bespeak a zeal in the senior members of the respective departments, which, I trust, will be warmly seconded by every subordinate officer. Those gentlemen who are in any degree acquainted with the writings of Dr. Hennen, of Mr. Guthrie, and of Mr. Copland Hutchison, will acknowledge, that never was there a period in which we had so much reason to boast of the state of our military and naval surgery. "While the mental and bodily powers of British seamen and soldiers have of late been put to the test of ultimate exertion in every clime, the medical of-

ficers of our fleets and armies participated in the moral and physical excitement produced by the portentous scenes around them; necessity, the mother of invention, was ever at work, prompting measures to obviate rising difficulties, which were overcome with a celerity truly astonishing; and the real extent of the powers of nature and of art have been ascertained in a manner more perfect than ever could have been done in private life." No one is now so unjust as to deny the numerous improvements which surgery has derived from the observations and experience of practitioners in the public service; but, while many of their brethren in civil life have been most honourably striving who should be foremost in expressing their sense of the merits of the military and naval practitioners, no one has spoken more handsomely on this point than the late Mr. Chevalier, whose language I cannot deny myself the pleasure of quoting to you, considering that the following sentiments, coming from the more distinguished members of the profession in civil life, must prove to every army surgeon the best reward for *past*, and the strongest incitement to *future*, exertions. In the Hunterian oration, delivered before the Royal College of Surgeons of London, in 1821,

Mr. Chevalier thus expresses himself, "It is not enough," says he, "that we advert to the benefits derived from surgery in the comparatively tranquil and measured course of civil life; we must not forget what it has accomplished in other and more turbulent scenes. We must turn to those seas and fields and mantling walls over which the thundering cannon has roared, where fire and sword have met in awful conjunction to support or to oppose unrelenting ambition. How many lives have been preserved, how many days and nights of agony and torment have been prevented, what solace and consolation have been afforded in the slow and gloomy hours of anguish, by the firm and faithful hand which surgery has been enabled to stretch forth to the relief of the suffering brave!" Sudden, arduous, and complicated, are often the duties which a naval or a military surgeon is called to perform; but well have those duties been sustained: the tried skill and humanity of our surgeons have been associated with the military glory of their country, and have divested the day of battle of half its horrors.

LECTURE II.

In my last lecture, Gentlemen, it was my object to bring to your notice the names of some of those distinguished individuals to whom we are indebted for practising, and for recording the successive improvements by which our art has been brought from the most rude and imperfect beginning to the scientific practice of the present day.

Before proceeding to the more immediate business of the course, the surgical treatment of those accidents and diseases peculiarly incident to soldiers and seamen, I conceive it will be useful to call your attention to some of those points in the physical constitution of individuals which best qualify them for the duties of a soldier, and to advert to some of those circumstances in the accommodation and equipment of troops, upon

the due regulation of which their efficiency and exemption from disease mainly depend.

Here I am sensible that I have nothing to offer but what must be already familiar to some of my hearers. I feel persuaded, however, that those who have had the benefit of the most extended experience will be the first to admit the importance of those topics upon the consideration of which I am now about to enter, more with the view of directing the attention of my younger friends to the proper objects of study, and to the best sources of information, than with the view of entering into the detail of duties, in the execution of which the king's regulations, the standing orders of regiments, and the instructions to regimental surgeons, must be their guides.

The subject which naturally presents itself as the first object deserving our attention, is the materials of which an army is composed. "The selection," says Dr. Jackson, "of persons possessed of intellectual and physical capacity for the practice of war, and the systematic instruction of persons so selected in approved forms of discipline, may be regarded as an object of high national concern. It conduces to the preservation of national independence, and, on this

ground, it demands the deepest attention of patriotic statesmen, and the closest study of scientific soldiers."

The examination and selection of recruits forms a primary and important part of the surgeon's duty,—a duty to which, every regard to his own credit, to the character of his corps, and to the interests of his majesty's service, imperiously requires his attention.

In the celebrated work of Vegetius "*De re Militari,*" we have some curious and interesting observations upon this subject. He remarks, that "all nations which are near the sun, (meaning of course the inhabitants of tropical countries) are dried by too much heat, that they are indeed abundantly wise, but unsteady in action, having too little blood they are fearful of wounds; that northern nations, on the other hand, abounding in blood, *(largo sanguine redundantes)* are more determined in battle, but are rash and inconsiderate. He, therefore, prefers conscripts from the more temperate regions, the inhabitants of which, says he, have a sufficiency of blood to render them regardless of wounds, and of death, while prudence is not awanting, which preserves moderation in camp, and does no little good in council and in action. In his

3d chapter, he inquires whether recruits from the country or from towns are the more useful, and hesitates not to give the preference to the rustic; bred in the open air, and in laborious occupation, capable of bearing the sun's heat, and negligent of shade; ignorant of baths and of delicacies, of a simple mind, and inured to toil, the warrior and the husbandman are the same, with only a change of weapons." From the country, therefore, the strength of an army is to be supplied; "for I know not," he exclaims, "how he should fear death most who knows least of the luxuries of life." "It is," says he, "to the scrupulous choice of our soldiers that we owe our conquests, and the glory of the Roman name!"

In this work are many more observations to the same purpose; and however fanciful the reasonings of Vegetius may appear to be, it is surprising how nearly his practical conclusions correspond in many instances with the experience of more modern times. Thus Dr. Jackson observes, that the poor, the pastoral, and semi-barbarous nations seem at all times to have been the conquerors of the rich, the commercial, the manufacturing, the polished, and refined. With this fact in view, the rulers of nations ought to select their soldiers from that

part of the community which most resembles the former description. The peasants of a country, particularly the shepherds and the hunters, are exposed in their daily occupations to vicissitudes of weather, and familiar with the situations and hardships which fall to the lot of soldiers in times of war. On the contrary, manufacturers and artisans, men little familiar with vicissitudes of weather, unaccustomed to exertion, to hardship, to fatigue, seldom temperate or healthy, helpless, and dependent on imaginary comforts, are ill calculated for the business of war.

To come to a still more recent and unquestionable authority upon this point, I beg leave to quote to you the following passage from a most interesting paper on the health of the Peninsular army, by Sir James M'Grigor, published in the sixth volume of the Medico-Chirurgical Transactions of London :—" Of the classes of society from which soldiers are recruited, I believe it will be found that, *cæteris paribus*, tradesmen and manufacturers, particularly those from large towns, are soonest swept away by the fatigues and diseases of an army ; and that those who have followed agricultural pursuits are the most healthy. Three hun-

dred and fifty-three recruits joined the 7th regiment in Portugal, in the years 1810-11. Of these two hundred and one were artificers and manufacturers, and one hundred and fifty-two had followed agricultural pursuits. In the course of a few months one hundred and twenty-two of the former died, and sixty-two of the latter; the proportion being six out of ten in the former case, and four out of ten in the latter."

These authorities would seem to set the question at rest, as to the superiority of the agricultural over the manufacturing part of the population, for the purposes of warfare; and it is almost superfluous to add, that my own observation induces me to concur entirely in the opinions just quoted. For certain branches of the service; for the cavalry and horse artillery particularly, recruits from the agricultural districts, men accustomed to the management of horses and of wheel carriages, are still more peculiarly eligible.

On the subject of stature, and of bodily conformation, I shall content myself with quoting to you the following remarks of Dr. Jackson, in which there is much just observation conveyed in the author's peculiar style: "Great strength ordinarily belongs to great bulk of body; and when man is opposed directly to man, it is rea-

sonable to conclude that the greater power will prevail over the lesser. But, in the present time, when the fate of battle is often decided by fire-arms, to which the hand of a man of six feet gives no more impulse than the hand of a man of five, it is not easy to see the reason of the rule which so generally influences the choice of those who select subjects for the formation of armies. It is admitted that a column of troops, of unusual stature and great weight of body, gives an idea of comparatively great power and great execution; and it is even true that, in consequence of such idea, the young soldier is often struck with fear, and leaves the field without fair trial; but this is only an uncertain contingence, and cannot, in fair reason, be calculated upon as a foundation for success in war. It is evident to the common sense of every one, that a body of men of unusual size presents an object of proportionally great volume, and as it is generally known that such body moves with little comparative celerity, it necessarily suffers a comparatively great destruction from missile force before it reach the point of attack. But besides the positive disadvantage of greater volume, probable slow movement, and consequently long exposure to destruction from fire-arms, before the

superiority of bodily power can be brought to bear, it is well known to those who have seen and estimated the effect of severe campaigns, that men of large size are ordinarily the first to fail under fatigue ; and medical men know, from observation, that they commonly suffer from diseases in greater proportion than others. These are facts which cannot be disputed ; and if they be admitted to be true, it will not be attempted to maintain that bulky men are the best subjects for ordinary military service."

The age at which soldiers are enlisted is a point of much importance, and does not appear to me to have always met with that attention which it merits. Upon the principle of inuring men from an early age to those pursuits in which they are subsequently to be employed, it is generally thought that we can scarcely enlist men too young ; there is really nothing, however, so mysterious in the duties of a soldier as to prevent a man, possessed of the necessary physical powers, from learning it at almost any period of his life, while, on the other hand, by enlisting boys, before their growth is completed and their constitutions formed, it is quite impossible to foresee whether they will ever attain those physical powers necessary to capacitate them for the du-

ties of a soldier; some of them will perhaps turn out better than we expect, but many of them will also, in all probability, turn out worse, and will ultimately prove a loss to the service, or what are termed in the army, "His Majesty's hard bargains." Indeed I believe I am correct in stating, that the mortality amongst recruits has recently attracted the notice of the highest authority; and this mortality I am disposed to attribute, in a great measure, to their enlistment at too early a period of life.

My sentiments upon this subject, as regards the selection of men for the Indian service, have long been before the public; you will see them referred to with approbation by Dr. Whitelaw Ainslie, in a paper upon this subject, published in a late number of the Asiatic Journal; and the very recent promulgation of an order from the War Office, prohibiting regiments serving in tropical climates from enlisting men under twenty years of age, would seem to show that the authorities are now satisfied of the disadvantages of an opposite practice. Although my remarks upon the inefficiency of young recruits, in my essay on the "Diseases of the European Troops in India," refer chiefly to men employed upon that station, yet I believe they will apply,

more or less, to the service generally, in all parts of the world.

Upon this point I have the misfortune to differ from some military friends, whose opinions I highly respect; but I agree with others, who must be considered as standard authorities on this subject. The opinion of Sir James M'Grigor may, I think, be gathered from the paper already quoted on the Health of the Peninsular Army, in which he observes, that "lads, unequal to the harassing duties of the service," as well as men whose frames have been worn out by disease, ought uniformly to be rejected; and Dr. Luscombe, in his valuable little work on the Health of Soldiers, is still more explicit upon this important point. "I must give it," says he, "as my opinion, formed on observation and experience, that it is very prejudicial to the efficiency of an army to admit lads or very young men, for these are not only unequal to the fatigues of war, but their constitutions not being as yet firmly established, they are almost certain to suffer greatly from change of climate, and to become sickly even in the ordinary course of service; and I am persuaded that a corps or army would be very considerably more healthy and efficient if all men under twenty were ex-

cluded, and recruits admitted of forty or forty-five years of age; for it is quite certain that a man of forty-five is much better able to encounter fatigue, and is also less liable to sickness, than a lad of seventeen or eighteen."

Into the physical defects which ought to lead to the rejection of recruits presented to a medical officer for examination, I can only enter very generally: every specific cause of rejection I cannot pretend to give in detail; this would carry me far beyond the limits I propose to myself in these preliminary remarks; they could not be easily borne in mind individually, and being specified in the printed instructions furnished to surgeons on this subject, their enumeration here becomes less necessary. My chief object at present is, to impress upon you the advantages of a systematic mode of proceeding in the examination of recruits. This examination ought never to be entered upon when the recruit is intoxicated, a state in which he is not unfrequently presented to the surgeon. He is, of course, to be stripped naked, and examined generally *a capite ad calcem*, both in front and in rear. He is to be made to move about the room, and to extend his joints and limbs in various directions, which will give the surgeon an

opportunity of observing any glaring malformation or distortion of the bones or contractions of the joints. The surgeon is then to proceed more minutely to examine the head, where if any obvious defect in its general formation, or any marks of severe fracture, with depression, nodes, exostosis, or tinea capitis, are observed, they must be considered as unfitting this individual for the service. All defects in the eye or lachrymal passages, polypi in the nose, malignant tumours in the mouth, extensive deficiency particularly of the front teeth, any appearances of caries in the jaws, either upper or under, are for the most part sufficient causes of rejection. In the neck, tumours, or rigidity of the muscles, with the marks of previous scrofulous ulcerations, are the circumstances most commonly met with as causes of incapacity. Distortions of the spine, and original malformations, or injuries leading to distortions of the ribs or sternum, so as to affect the circulation or respiration, are decided causes of rejection; as are all indications of a phthisical habit. Abdominal tumours, and herniary protrusions of every description, varicose enlargements of the spermatic vessels, and diseases of the testicles, should be considered as sufficient to incapacitate the individual for the service.

Distortions of the arms, thighs, legs, or ancles; exostoses, nodes, ulcers, or extensive cicatrices of ulcers; varicose veins, and contractions or rigidity of the joints, are all to be looked upon as causes of rejection.

By adopting this systematic mode of proceeding in succession over the head, trunk, and extremities, much time will be saved; any very serious defect can scarcely escape the surgeon's observation; and it behoves him, as he values his own credit and comfort, to be accurate and minute in this inspection. I have already alluded to the instructions which are from time to time issued to medical officers on this subject, and which, so far as they go, must form an implicit guide; but there are still many points left to his own discretion, which no regulations or standing orders in this country distinctly provide for. In the writings of Dr. Hennen, of Mr. C. Hutchison, of Dr. Cheyne, and, above all, of Staff-Surgeon Marshall, you will find much interesting and authentic information applicable to the examination of recruits for the British army, and to the fictitious diseases of soldiers and seamen, a subject to which I shall have occasion to advert more at length in a subsequent part of the course. Mr. Marshall has, I may say, made this subject

almost exclusively his own; and his little work to which I allude, although published in a form the most unassuming, and under the modest title of "Hints to Young Medical Officers of the Army on the Examination of Recruits, and respecting the Feigned Disabilities of Soldiers," contains information for which the most experienced of us will be ready to offer our acknowledgments to its author.

On many of the points to which I have thus cursorily adverted, a medical officer may be greatly assisted in forming an accurate judgment by an attentive study of the French "Code de la Conscription," of which an abstract is to be found in the sixth volume of the Edinburgh Medical and Surgical Journal. There is also a "Memoire sur le Choix des Hommes Propres au Service Militaire," published by Beaupré, an article on the "Simulation des Maladies," in the "Dictionnaire des Sciences Medicales," by Baron Percy, and some observations on this subject in the "Hygiene Militaire" of Revolat, well worth your attention. The many attempts made to evade the operation of the conscriptive laws in France during the revolutionary war, induced the authorities to frame and enact a set of regulations for the guidance of those concerned in examining

conscripts, embracing almost every point on which a doubt or difference of opinion can exist.

Of the regulations for recruiting, and the mode of medical inspection, as applicable to the Austrian service, you will find a full account in a work in the German language, by Isfordink, first field-physician to the Austrian army. This work I am not yet in possession of, but from a brief notice of it with which I have been favoured by Dr. Russell, it appears to contain much valuable information on all the subjects which I propose to consider in these introductory lectures. In this work, it is held expedient to prohibit every conscript from marrying who pleads exemption from military service on account of internal, obscure, or doubtful disabilities, such individuals being likely to produce sickly children. A measure like this, however repugnant to the ideas of liberty imbibed by every British subject, might probably be an effectual check on the simulation of disease.

Having offered these cursory remarks on the component parts of an army, I proceed to observe, that its health is an object of equal importance with its existence; indeed, an army without health becomes a positive burden to the state it was intended to serve.

In all large armies more men perish by inbred disease than by the sword of the enemy. It has been, perhaps truly, observed that more campaigns have been decided by sickness than by battle; and "that the laurel is as often withered on the hero's brow by the pestilential blast of contagion, as torn from it by the arm of a foe."

The diseases of soldiers, while they admit of all the usual classifications and nosological arrangements into febrile, inflammatory, and so forth, have, with reference to their peculiar mode of life, been divided into diseases of the Camp and of the Garrison. The former have also been characterized as the diseases of summer and of autumn, this being the season of the year for encampment; and here fever and dysentery have, from the earliest ages, been the scourge of armies; have always been a source of infinite loss to the service, and of unceasing labour to the medical attendants. Of the extent to which these two diseases prevailed in the Peninsular army, you may form some conception from the following statement extracted from Sir James M'Grigor's account of the diseases of that army. There were admitted during the years 1812-13, and part of 1814, sixty-eight thousand eight hundred and ninety-four cases of fever, of which six

thousand seven hundred and three died; and during the same period there were admitted into the regimental hospitals seven thousand five hundred and twenty-six cases of dysentery, of which four thousand seven hundred and seventeen died.

The diseases incident to soldiers in garrison, or quarters, have also been characterized as the diseases of winter, and of the early part of spring; they consist (in this part of the world at least,) chiefly of inflammatory affections of the chest, rheumatic complaints, venereal diseases, and ophthalmia.

In estimating the proportional sickness amongst troops at different seasons of the year, Sir John Pringle has given a statement from his experience in Germany, in Flanders, and in this country, during the campaign of 1742 and the subsequent years. As this estimate will, in ordinary circumstances, be found to approach pretty near the truth, the following passages from his chapter "On the seasons compared with regard to the health of an army," may not be undeserving of your attention. "In the beginning of every campaign, (says he) we are to expect, for the first month at least, that the returns will be considerably higher than if the men had remained in quarters. The

earliest encampment began on the 8th of April, and produced such a number of sick, that in a month's time the returns amounted to a twenty-seventh part of the whole. In the year 1745, the campaign was opened on the 25th of April; and in 1747, on the 23d of the same month, both in the *Low Countries*, but in the year 1746, the troops encamped on the 23d of April in the north of *Scotland*, which, considering the latitude, may be reckoned of all the earliest campaign during the war. And from all these instances, there is reason to believe, that the first proportion mentioned will generally hold when the army takes the field in *Flanders* in the first or second week of April. At the end of the campaign in *Germany*, the number in the hospital were to the men in health as three to thirteen. In 1747 when the troops left the field, the sick made about one fifth part of the whole number, but if we consider by itself the detachment sent that year into *Zealand*, this proportion was just inverted; for the men in health were to the diseased only as one to four." We learn also from the same authority, that of the troops stationed during 1747 in South Beveland and the Island of Walcheren, some of the corps were so sickly as not to have more than one hundred men fit for duty, which was less than the

seventh part of a complete battalion; "the Royals, in particular, at the end of the campaign, had but four men that never had been ill."

Although it is not at present my purpose to enter upon the very important subjects of Medical Geography and Topography, but rather to limit my remarks to such circumstances as involve the health of troops in all parts of the world, I have yet been tempted to lay before you the foregoing extracts, because they apply to a situation which both in former and in later times has proved the most inimical to the health and efficiency of the British army. The recent loss of nearly four thousand men on the island of Walcheren, is fresh in our memories, and gives this subject a painful interest to every British officer.

It is obvious however, that only a very distant approach to accuracy can be expected in our endeavours to estimate the loss likely to ensue on any given service, as this must ever be dependent on the state of the weather, the provisions and comforts with which an army can be supplied, and its success or discomfiture by the enemy; if we include the probable casualties from wounds, the calculation is still rendered more difficult; it may however be worth while to state to you the following abstract of the returns of

sick and wounded in the Peninsular army, from 21st December 1811 to the 24th June 1814, a period of considerable duration, embracing very active operations, and giving altogether a view of the chances of war upon an extended scale. It is the most recent and most authentic account we possess of the contingencies incident to a European army fighting on a European soil.

On reference to the returns of sick and wounded for the above period, it appears that three hundred and forty six thousand one hundred and eight cases of disease or wounds were treated in the hospitals: of which were discharged cured two hundred and thirty two thousand, five hundred and fifty three: four thousand five hundred and eighty sixty were invalided: and eighteen thousand, five hundred and thirteen died of their wounds or of disease; including however every wounded man who had been received into hospital, or who had even been seen by a Surgeon.

From these details you will understand what you may expect to meet with in accompanying an army to the field; but you must also be given to understand that sickness is not always the necessary consequence of a military life, and that your professional skill and judgment may do much to obviate its ravages when it does occur.

This may be learned from various interesting accounts both of ancient and of modern wars. In the circumstantial details of the operations of Julius Cæsar's well disciplined army, we hear of none of his enterprises having been frustrated by the prevalence of disease amongst his troops: and although in many instances exposed to fruitful sources of disease, and sometimes suffering severely from it, the gallant army which lately served in the Peninsula was kept for years together in a state of efficiency which enabled it repeatedly to conquer, and ultimately to triumph over an obstinate and determined enemy. That much of this efficiency was justly due to the zeal and ability which directed the medical concerns of that army, I hold the following fact to be an abundant proof. During the ten months from the siege of Burgos to the battle of Vittoria inclusive, the total number of sick and wounded which passed through the hospitals was ninety-five thousand three hundred and forty-eight. By the unremitting exertions of Sir James M'Grigor and the medical staff under his orders, the army took the field preparatory to the battle with a sick list under five thousand. For twenty successive days it marched towards the enemy, and in less than one month after it

had defeated him, mustered within thirty men as strong as before the action,—and this too without reinforcements from England, the ranks having been recruited by convalescents.

But it is in the navy, Gentlemen, perhaps even more than in the army, that the effects of prophylactic measures, both medical and military, have had the most conspicuous influence in diminishing sickness and mortality. A fleet under ordinary circumstances, where the discipline and interior economy of the ships are good, having the necessary supply of warm clothing and wholesome provisions, having the means of perfect ventilation and cleanliness; above all, having it in their power to keep disorder and intemperance in check, may attain a degree of health which can never be expected in an army on active service. A long sea voyage was formerly considered one of the most unhealthy situations to which a man could be exposed, while by the institution and enforcement of prophylactic measures a ship's company may now be conducted round the world, exposed to every vicissitude of climate, and to all the hardships and dangers of the sea, with a smaller proportional loss of men than would have happened in any other given situation. The gallant Lord Nelson is said, by

wholesome regulations and rigid discipline to have kept the crew of a vessel he commanded in such perfect health as not to have lost a man by death in *three* years, and this too on the West India station!

The name of this distinguished officer, thus honourably connected with the health of his crew, reminds me that although it belongs to the medical officer to suggest measures for preserving the health of seamen and of soldiers, it belongs to the commanding officer to give them due effect. The superiority of prophylactic over remedial measures upon all occasions has been distinctly pointed out by numerous writers, and must never be lost sight of. Sir Gilbert Blane remarks, that it could be made evident in an economical and political point of view, independent of moral considerations, that the health and lives of men might be preserved at a much less expense than what is necessary to repair the ravages of disease; and Sir John Pringle, to whose authority I always appeal with pleasure, has observed, that "although most of the causes of disease are hardly to be avoided in time of actual service, yet as these only dispose men to sickness, and do not necessarily bring it on, it is incumbent on those who have the power, to make

such provision as shall enable the soldier to withstand most of the hardships of a military life;" and, he adds with much truth, "that the preservatives from disease are not to depend on *medicines*, nor on any thing which a soldier has it in his power to neglect." I do not at all consider it necessary to adduce farther authority in support of a position almost self-evident, but I cannot resist this opportunity of pointing your attention to the following passage, in which our late venerable and lamented professor of the practice of physic in this University has, with that force and eloquence so peculiarly his own, shown us how inadequate, the habitual use of medicine is to secure that vigour of constitution upon which the efficiency of a soldier so essentially depends. "Neque multo profecerunt qui ad normam medicam vivendi rationem semper accomodare tentaverunt; et minus adhuc qui *ope remediorum* prosperam valetudinem firmare et conservare conati sint:—omnis autem tuendæ sanitatis cura, omnisque morborum arcendorum spes et fiducia, hoc solo cardine versantur, nempe, ut a causis morborum remotis, cum ab iis quæ proclivitatem faciunt, tum quoque ab iis quæ in corpore sic proclivi facto morbum quemlibet excitent, quantum fieri possit, præ-

caveatur, et hæ omni cura evitentur, illæ corrigantur."

Let us now advert more particularly to those causes of disease amongst troops which have so often been found to paralyze the arm of a general, or to disappoint the sanguine hopes of a nation;—of these causes, irregular, sometimes scanty supplies of food, intemperance in the use of liquor, exposure to the inclemencies of the weather, severe and long continued bodily fatigue, constitute the most obvious and the most important. In so far as many of these causes are unavoidable, it becomes necessary for soldiers to learn to bear those evils which they cannot shun, but to enable them to resist, as far as possible, the operation of those unfavourable circumstances in which they are often placed, and to enable you to form an opinion on points upon which a medical officer often is, and still oftener ought to be, consulted, I proceed to offer you a few observations on matters affecting the health of soldiers individually and collectively; first, on the diet, clothing, and exercise of troops; next, on their accommodation in camp and in quarters; on their treatment in hospital; and, lastly, on the means of transporting them when wounded; with all which, as military surgeons, it behoves you to be intimately acquainted.

The importance of wholesome diet to the preservation of health, and its efficacy in resisting the inroads of disease are universally acknowledged. The food of a soldier may be coarse, but it should always be wholesome, nutritious, and, I should say, abundant, although a distinguished military writer has dwelt upon the advantages of inuring soldiers to habits of abstinence. Dr. Jackson observes, that "dignity of mind and real military virtue have no connexion with sumptuous living. The conqueror is ordinarily frugal and homely, the conquered is ordinarily rich, luxurious, and what is called refined. The Spartan nation was temperate and frugal; it was august in the assembly of nations, and warlike in the field of battle. Cleomenes, one of the Spartan kings, found at his accession to the sovereignty that, instead of Spartans of the school of Lycurgus, a degenerate race filled the military ranks, men corrupted by the luxuries of Asia, and absorbed in the pleasures of the table. He meditated reform, and the first step was the re-establishment of the public mess and frugal meal. Cleomenes was plain in manner, and abstemious at the mess; but no sovereign whose record stands in history, was more dignified in mind, and no one—not even Louis the Magnificent, in

all his grandeur,—commanded a devotion equal to what was voluntarily given to this simple and meanly attired Spartan. It is reported of General Wolfe, who, while a man of superior goodness, was perhaps the most perfect soldier of the age in which he lived, that the cook and butler did not much engage his attention. He never gave an elegant, and rarely an eatable dinner to persons of the *haut gout.* The epicurean was disgusted—the soldier was regaled. General Wolfe's table was said to be an epitome of a Spartan mess-room; no one rose from it without having been furnished with the opportunity of carrying away a military lesson; and few left it without feeling an accession of military importance communicated to the mind by the impressive influence of a hero's spirit."

In his last work on the "Formation, Discipline, and Economy of Armies," Dr. Jackson has adduced much ingenious argument in support of his views of this subject; and he concludes by observing, that luxurious living places the military character on the brink of destruction; "for," says he, "if there be any thing like correct observation among men, it may be confidently asserted that, if high living be the life of the gentleman, it is the death of the soldier." It is ob-

vious, however, that such observations as the foregoing, although just in themselves, can only be addressed with propriety to the officers—to the educated, and reflecting part of the army; and habits of abstinence are so little congenial to the disposition of an English soldier, that he will never practise them when he can do otherwise.

I believe that much is to be gained in all cases by rendering the issues of provisions as regular as possible in point of time, whether circumstances enable us to render them abundant in quantity or compel us to deliver them with a sparing hand. They should always, if possible, be issued daily; for when three days rations are issued at once, as is often the case, the soldier is frequently found to devour or waste the whole in one day, and must necessarily starve for the two following, unless he has an opportunity of plundering, to which this very circumstance forms an additional inducement.

When salted provisions are issued, it becomes an object of considerable importance to have them properly prepared, by being steeped, if possible, in water for some time previous to their being dressed. Of the injurious consequences sometimes occurring from ignorance of the mode of cooking such provisions, you will

find a remarkable example recorded by Dr. Andrew Marshall in a thesis De Tuenda Salute Militum, published here in 1782; and although I cannot compliment this gentleman on the elegance of his language, the fact is worthy of being remembered. "Nova cohors, post hoc bellum susceptum, quae subsidio Gibraltariæ imissa fuit (sicut accepi a præfecto militum, observandi capacissimo, quique tunc temporis ibi merebat) per primum tempus ex quo advenisset magnopere ægrotabat, multaque fortia corpora amittebat; nec quicquam ultra accusatum, quam quod salitis cibariis uti nesciebant: Cohortes ceterae experientia doctae artem salita ad insalsum restituendi nactae erant; et qualiquali materia vegetabili praebita jusculum saluberrimum ex salitis praeparare solebant; ideoque erant sanae."

Wherever circumstances will admit, great advantages will be derived from an established system of cooking in small messes. We know from experience that soldiers almost uniformly prefer, when they have it in their power, to roast or fry their morsel of meat, and often devour it all at a single meal—this is by no means making the most of it, if boiled with vegetables and salt, and made into a wholesome soup; this soup will suffice for a large portion of

one meal, while a part of the meat may be reserved to be eaten cold on a future occasion. Such soup will always be most advantageously prepared in messes, and accordingly we find that the Duke of Wellington, fully sensible of the advantages of this system, enjoined it by general orders, directing that the men, whether in the field or in quarters, should be divided into messes, under the superintendance of an officer, that they should have regular meals, and that their meat should be well boiled with a proportion of vegetables and salt, whenever they could be procured; as to the selection of vegetables for this purpose it is not necessary to be over fastidious. Besides the various kinds of cabbage, carrots, turnips, &c. the produce of the garden, there are various kinds of cresses, sorrel, and other vegetables growing wild in the field which make no unpleasant nor unwholesome additions to soup. In the north of Scotland a palatable soup is made with the common nettle, a weed we all know to be sufficiently abundant. The system of cookery is simple and soon learned in so far as respects the soldier. The fundamental rule consists in boiling slow and in roasting quick.

Amongst non-commissioned officers and married men the practice of breakfasting comfort-

ably on warm tea or coffee is very general, and, with proper management, the same comfort might be procured for the whole. Breakfast messes are not yet, however, universal in the army, although the comfort and advantage of a warm breakfast are, I believe, admitted by all who have thought upon the subject. Of its beneficial effects upon the health of soldiers under particular circumstances, I enjoyed, while surgeon of the 33d regiment, an opportunity of confirming my own opinion, and of convincing others. During the prevalence of a malignant fever in this regiment, then stationed in the garrison of Hull, in the autumn of 1817; amongst other measures calculated to check the rapid extension of the disease, I recommended the regular supply of a breakfast of warm coffee to the men. This was immediately ordered by the commanding officer, and nothing appeared either to the officers, to the soldiers, or to myself, to have so much effect in obviating the attacks of the fever.

We are informed, on the authority of two experienced navigators, Captains Forrest and Bowen, that they had uniformly observed when sailors became fond of tea, they were weaned from drinking strong liquor to excess; and therefore, says Captain Forrest, I encouraged tea drinking as much as possible, but without assigning my

reason for so doing. No breakfast is, I believe, so generally acceptable to English soldiers and seamen as tea or coffee; and those who declaim against the supposed relaxing qualities of these beverages, may be answered in the words of Sir Gilbert Blane, "I would ask," says he, "whether British courage and hardihood appear in the late exploits by sea or land less splendid than at Cressy or La Hogue? whether there is to be found in the results of the battles of Trafalgar and of Waterloo any proof of British nerves being unbraced by the habitual use of this beverage? and whether the physical and moral energies of our officers and men will not stand a comparison with those of their forefathers, or of their enemies, neither of whom were drinkers of tea?"

Before quitting the important subject of diet, it may be well to offer you a few remarks on the intemperate use of spirits which has at all times proved such a bane to the British service. It is not, however, my purpose at present to enter at length into the scientific and professional views of this subject, which have been taken by Trotter, Jackson, M'Nish, and very recently, by a distinguished physician of the Irish Metropolis. This is one of those numerous cases in which it is more easy to expatiate upon the evil than to point out the remedy. It were more easy to

enumerate, from the catalogue of human ills, a host of diseases to which intemperance gives birth, than to specify one which is not aggravated by it. With the deleterious effects of hard drinking upon the discipline of corps every officer is familiar. The more common consequences of it, as detailed by Mr. Bell, formerly Surgeon of the 5th Regiment, are neglect of duty, insolence to officers, forgetfulness of subordination, rioting in the streets, selling appointments, and desertion. "During several years," says he, "that I was stationed with the regiment in Ireland, I re-recollect only three instances of punishment being inflicted in that corps where the crime was not owing to the excessive use of whisky."

Of the destructive effects of dram-drinking on the health of soldiers, you will find a remarkable instance noticed incidentally by Dr. Rollo, in his account of the Artillery Hospital at Woolwich, where he states that in the year 1789, the 45th regiment, then stationed in Grenada, lost within a very few weeks, twenty-six men out of ninety-six sick, and of such of these as were opened, the whole were found to have ulcerated intestines; and fourteen of them had abscesses in the liver. The circumstance was the more remarkable, as the island was at that time considered

healthy; and, upon an investigation into the causes of the mortality, one was particularly remarkable; the common breakfast among the men was a glass of raw spirits, with a small slice of broiled salt pork, the spirits being not unfrequently repeated during the day.

It is chiefly indeed upon foreign stations that the ruinous consequences of excesses amongst the soldiery are conspicuous; and perhaps there is no situation where it is seen in a more deplorable shape than in the remote quarters in India, where it was my lot for sometime to serve. At the time of my leaving India, Canteens were not established (as I believe they now are) at the different stations of the army, where a supply of genuine spirits, porter, ale, or other beverages might have been retailed to the men; and they were in consequence often induced to straggle to a great distance from their camp or cantonments in search of liquor. They obtained it of the very worst description, and when in a state of brutal intoxication from its influence, they often lay exposed to the sun, to the parching land winds, or to the night dews, all fertile sources of disease in that climate. They were also not unfrequently, in such circumstances, subjected to the ridicule, insults, or maltreatment of the natives; and indeed,

when I look back to the scenes which I have witnessed in that country, it appears to me a matter of surprise that our hold of it has not been materially weakened by the dissipated character of the European soldiers in India. Another very obvious evil was the large balances of pay which were often allowed to accumulate in that quarter, particularly when men were sick in hospital. The very reduced amount of the hospital stoppages in India, occasioned to the government a large additional expenditure for hospitals, and entitled the soldier often to receive a very large sum immediately on his dismissal from the sick-list; the consequence was, that he almost invariably entered on a course of dissipation, which very probably ended in a relapse of his former complaint, or perhaps a new one was contracted by an unguarded connexion with the first prostitute he met. Perhaps he neglected his duty while in a state of intoxication, or, in this state of excitement, became insolent to his officers: either event led to his confinement, to his subsequent punishment, and to his being replaced in hospital, where he lay till a similar balance was again accumulated, went out, and acted the same scene over again.

One notorious character of this kind I well

recollect in the Royals, who carried the system of alternate dissipation and sickness to such an extent, that he spent nearly his whole time between the guard-house and the hospital, not doing six months' duty in the course of a whole year. Upon one occasion, this individual fell upon an effectual device to rid himself of that restraint to which his misconduct had subjected him. A large log of wood (subsequently exchanged for a bomb-shell) had been chained to his leg, for the purpose of preventing his getting over the barrack wall. Pat. went very deliberately into the cooking-house, put the log in the fire, sat beside it till it was burnt away, then went over the wall, and was found next morning in the pettah, or native village, as drunk as usual.

Such individuals are to be found in every regiment, to whom the words of Bishop Berkeley, *mutatis mutandis*, are peculiarly applicable :— "Albeit there is in every town or district in England some tough dram-drinker set up as the devil's decoy to draw in proselytes." And how successful these decoy-ducks are in the army, the numerous instances of madness, of maiming, of suicide, and of murder, which occur on some foreign stations, and particularly in India, afford melancholy proofs.

I have now before me the copy of a circular letter, addressed, in December 1812, by order of the late Sir Samuel Auchmuty, to the officers commanding divisions of the Madras army, in which, while he deprecates the frequency of corporal punishments, and dwells upon the propriety of substituting solitary confinement, extra drills, and privations, he at the same time points out the propriety of encouraging amongst the men such exercises and amusements as tend to relieve ennui, "to which," says he, "and to the effects of intemperance and indolence upon uneducated minds, may be partly ascribed the excesses, irregularities, and atrocious crimes, of which in this army of late there have been but too many examples. Seldom, however, does the criminal, in his last confession, avow any other reason for his offence than his being *tired of life*. This, then, is to the commander-in-chief an unanswerable proof, that from himself to the last officer in the army, the most sacred duty attaches, to resort to such means as experience and the study of the soldier's character may dictate, to render the life as valuable to the soldier himself as it is to his country."

In addition to those local precautions against intemperance which are applicable to particu-

lar stations, forts, or barracks, I would recommend, as general measures calculated to check this destructive habit; the regular establishment of two, or, in situations where the abundance and cheapness of provisions renders it practicable, of three meals a-day; the frequent payment of the soldiers' balances, weekly instead of monthly, as used to be the case, by which these balances will be prevented from ever accumulating to a sum capable of supporting any continued course of dissipation; the augmentation of the hospital stoppages on the Indian station to the same amount as in other quarters of the world; the furnishing the men upon all stations with the most approved description of clothing and appointments, calculated to add to their comfort and efficiency, while it tends to diminish the sum of money left at their own disposal; these, and the supply of wholesome liquor, where it cannot be altogether withheld, constitute the principal, perhaps the only, means which a surgeon has it in his power to recommend, or a commanding officer to enforce.

In adverting to this subject on a former occasion, I hinted my desire of seeing a register of deaths kept in every regiment, calculated to show, amongst other interesting particulars, the proportion which the deaths of the orderly and

well-behaved soldiers bear to the drunken and dissipated. This might, perhaps, eventually be turned to some account, in restraining those excesses so prejudicial to the character, to the discipline, and, above all, to the health of the soldier.

Upon the subject of clothing, I conceive it unnecessary to extend my remarks far; the exterior appearance of troops in their dress and appointments is considered so exclusively the business of the commanding-officer, that the suggestions of the surgeon are not, perhaps, likely to meet with either attention or respect; nevertheless, occasions do occur on which defects, either in the quantity, quality, make, or timely supply of clothing, may materially affect the health of the troops; and in every such case it falls within the legitimate province of the surgeon to make a respectful representation to his commanding-officer on the subject. The great purpose of clothing in these climates is to protect our bodies from the cold; and the principal objects of attention in constructing the soldier's dress, are to procure a due degree of warmth while he is not burdened by an unnecessary weight, and to take care that he is not hampered by an undue constriction of his limbs, or

cramped in his motions by tight ligatures around the joints. These objects are by no means incompatible with that uniformity of appearance, and that gay coup d'œil of a parade so much prized by a military eye, and of which, to a certain extent, I am far from disapproving. But the part of military dress in which the surgeon is really most interested is that farthest from becoming an eye-sore to the commanding-officer; I mean the part of it nearest the soldier's skin.

"The experience," says Sir John Pringle, "which we have had of under waistcoats during the winter campaign in Great Britain should teach us to make the same provision for the whole army in any future war. None of the foreign soldiers are without this necessary part of clothing; and, indeed, no man of the meanest condition abroad. Under waistcoats would not only be useful in winter quarters, but greatly so on first taking the field, and towards the end of the campaign." That the above sentiments are perfectly in unison with those of the present Director General of the Medical Department, may be learned from the following paragraph of his paper on the health of the Peninsular army: "How necessary warm clothing is to the soldier may be conceived if we reflect how often he sleeps in the

open air, often in cool nights, and sometimes under dews and night fogs, and how subject he is to the alternations of heat and cold, the fruitful source of one class of disease. From the nature of the service in which we were engaged it was not possible to have the men always regularly clothed, though our illustrious commander was never inattentive to this, nor to any thing that could conduce to the soldier's comfort. In whatever climate or quarter of the world a regiment is stationed, the yearly supply of clothing for it should be sent out, so as to arrive in due time, and so that the soldier may put it on before the accession of the cold season; that is, before winter sets in in Europe, and by the time the rains set in in tropical countries. The waistcoat is an indispensable part of the clothing of a soldier, and ought never to be omitted. He should have linen trowsers to march in, when in a warm climate like that of the Peninsula, reserving the cloth pantaloons for the cold and rainy season. The best clothed were generally among the most healthy regiments."

Some objections have been offered to the general use of flannel shirts as part of a soldier's dress, particularly the difficulty of having the shirt so frequently washed and changed as it

ought to be, without which it is, perhaps, worse than useless; but in some given situations my personal experience enables me to vouch for the utility of flannel. Of this we had a very striking proof in the second battalion of the Royals, while suffering from a most aggravated form of dysentery in India. General Conran, the late Lieutenant Governor of Jamaica, who at that time commanded the Royals, was so fully persuaded of the benefits likely to accrue to his men from the general use of flannel, that he went down from Wallajahbad, where the regiment was then stationed, to Madras, on purpose to represent to the government the distress of his men, and to suggest the expediency of a supply of flannel shirts. This he did with so much effect, backed by the late Dr. Anderson, the Physician-General, that the flannels were immediately ordered, and, in my opinion, contributed much to check the alarming progress of the disease.

In some instances the very mode of cleaning the soldier's clothing has been a means of inducing disease; thus the cleaning of the white breeches or trowsers with wet pipe clay, and putting them on before they are thoroughly dry, is apt to occasion rheumatic attacks, of which I have seen numerous instances. It therefore becomes the sur-

geon's duty, by his personal remonstrances and representations to the officers, to do every thing in his power to check a practice so likely to hurt the health of his men. The use of pipe-clay indeed ought strictly to be confined to the belts, gloves, and other leathern appointments, and ought not to be employed so much as it is in cleaning other parts of the dress ; it is at the best (as a facetious friend of mine used very emphatically to express himself) only putting a quantity of white dirt over a quantity of black dirt.

On the subject of personal cleanliness it might naturally be supposed that few injunctions would be necessary, and that men, even when left to themselves, would take the most effectual means of securing a comfort so essential to their health. Experience, however, teaches us otherwise ; and we daily see men whose sloth and dirtiness are such that neither the immediate comfort arising from cleanliness, nor the ultimate effects resulting from the want of it upon their own health, nothing indeed short of actual punishment is sufficient to ensure a due regard to it. We never fail to observe both in the army and the navy, that those men who are most slovenly in their persons are always the first to suffer from disease. The profuse perspirations induced by active mi-

litary operations, the quantity of sordes collected about the persons of soldiers by marching on dirty roads, or even going through the evolutions of a field day, are only to be removed by perfect ablution; and for this purpose bathing should be encouraged wherever circumstances and season render it practicable. "To live comfortably," says General Maitland, "men must be cleanly; it improves every advantage and lessens every evil; cleanliness in the person of a soldier, and in the barracks and hospital, are almost certain indications of a good regiment."

One of the most important steps towards personal cleanliness which the English army has made, since I knew any thing of it, is the general adoption of cropping, and the consequent abolition of those quantities of powder, soap and pomatum, with which the heads of the soldiers used to be besmeared. On this point, Gentlemen, I speak with some degree of feeling, for at the time the general order for cropping was issued, I belonged to a regiment in which the surgeons, in common with every other officer and man, were compelled to wear their hair in full sized queues, and their whiskers bedaubed with powder and pomatum.

The benefits which accrue to health from habits of exercise are so well understood that you will perhaps be surprised to hear me observe that

upon this point I have occasionally had prejudices to encounter. I have met with some officers in the army, who, although disposed perhaps to take plenty of exercise at their own time, and in their own way, were quite unable to see the utility or advantage of being summoned at an early hour in the morning to parade for drill along with the men. I have known them contend that these drills, which were so unpalatable to them, were injurious to the health of the soldiers, and have heard it very broadly hinted that it was the surgeon's duty to represent this to the commanding officer ; but I have always been excessively slow of conviction upon this point, being decidedly of opinion, with Sir John Pringle, that "although a soldier is occasionally liable to great fatigue, the most frequent error of people of that class, if left to themselves, would be on the side of rest." The Romans, who owed more to the discipline of their armies than any nation upon earth, were extremely rigorous and persevering in their exercises. They practised their soldiers in every species of service that might occur, so that nothing at any time happened with which they were unacquainted. Actual war was in reality a time of relaxation to the soldiers of this enterprising people. The Romans were not

only sensible of the advantages which those habits of exercise procured them in action, but had also the penetration to discover that they were eminently serviceable in the preservation of health. We learn from Vegetius that the Romans exercised their men daily in the Campus Martius when it was fair weather, and under cover when it rained or snowed, and this author adds a remark by no means flattering to the members of our profession, *Rei militaris periti, plus quotidiana armorum exercitia ad sanitatem militum putaverunt prodesse, quam medicos.*

While troops are conveyed in transports to foreign stations, the general orders direct that when the weather will admit of it they should be frequently drilled on deck in the open air, and that such amusements should be encouraged as are calculated to keep them in exercise. It is of consequence also that troops coming to a climate different from their own should be somewhat habituated to it before they enter on the fatigues of service. New levies or regiments having many recruits, should, if possible, be first sent on garrison duty. The practice (says Sir J. M'Grigor) was a good one, of sending troops destined for the Peninsular service to Gibraltar or Cadiz for sometime before they joined the

army. Recruits, by this means, attained the habits of soldiers and were inured to the climate and peculiar service before they entered into all its fatigues." He recommends that while stationed in such garrisons they should be fully exercised as preparatory to the duties of the field; and he adds two very striking illustrations of the advantages which seasoned men possess over recruits in going through the fatigues of a campaign. From the 19th of August 1811 to the 20th of May 1812, the 7th regiment lost one hundred and sixty-nine recruits out of three hundred and fifty-three landed in the preceding June; while in the same period it lost only seventy-seven out of eleven hundred and forty-five old soldiers. The 40th regiment lost, during the above period, one hundred and four recruits out of four hundred and fifty landed in the preceding July, and only sixty-six out of eleven hundred and seventeen old soldiers; yet no regiments on that service were more ably commanded or better officered, than the Fusileers and 40th regiments. It would be easy to enlarge here on the importance of exercise as a branch of military education, but I rather choose to limit my remarks to what is needful towards preserving an army in health; and without specifying more

minutely the exercises or amusements which ought to be encouraged, I may observe, that walking, running, leaping, swimming, wrestling, and fencing, are (as every one knows) exercises often useful in the actual practice of war.

LECTURE III.

The next object of attention, according to the arrangement I have laid down, is the accommodation of troops in camp and in quarters.

The situation of a camp must sometimes be regulated by accidental circumstances, over which the opinion of a medical officer can have but little control; and on some occasions we do not find the ruling powers ready to give that weight to medical opinion which, when deliberately formed and unobtrusively offered, it ought always to possess. This sometimes, no doubt, proceeds from an officious meddling disposition on the part of medical officers themselves, leading them to form hasty prognostications, and to offer immature and unasked for opinions, a conduct against which, Gentlemen, I cannot too early caution you; nothing more readily tends

to disgust an experienced commanding officer, nothing is so much calculated to annihilate that preponderance so justly due to the liberal education and philosophic views which medical men, in the present day, are expected to possess.

Of all the circumstances connected with a camp, the most important is its site; the experience of all ages has proved that the neighbourhood of marshes, grounds subject to be overflowed by large rivers, surrounded with foul stagnating water, or low places covered with wood, are most injurious to health; and the noxious effluvia arising from these situations are augmented in proportion to the heat of the climate, or the season of the year; hence such neighbourhoods become more dangerous for encampments in tropical regions, and in our own country during the heats of summer and of autumn. The danger of such situations is also, in some degree, dependent upon the temporary or permanent nature of the establishment we have in view. Thus ground may sometimes be taken up for a night's residence, which would be very ill adapted for a permanent station. For the moveable camps of India, where the army encamps at the end of every day's march, and often changes its situation daily for months in succession, positions

are occasionally taken up which would be ill adapted to the stationary camps sometimes formed in this country, still less to an entrenched camp, or to a barrack. When necessity compels an army to encamp on wet or marshy ground, every effort should be made to render it as dry as possible, by means of drains cut across the field, and round the tents; and whenever circumstances permit, an abundance of straw, ferns, or heath should be furnished to the men, to be interposed between their bodies and the ground, when lying in the tents. When a camp is inevitably situated near a standing pool or marsh, that side of the tents, marquees, or huts, which faces the marsh should be closed as much as possible, or rather all the openings, windows, and doors, should be made on the opposite side, in order to shun the ill effects of the exhaling vapour. Of the mischievous consequences sometimes arising from the injudicious position of a camp, you will find a recent instance noticed by Mr. Proudfoot of the 27th regiment, in the second volume of the Dublin Hospital Reports; and as this affords also an instance of the evils occasionally arising from unfounded alarms about contagion, it has a double claim upon your attention.

During the prevalence of an epidemic fever,

amongst the troops stationed at Carthagena, in the autumn of 1812, the death of a distinguished officer, Major-General Ross, first excited alarm. "This officer died at Galleras, a fort situated on the summit of a hill of considerable height, on the west side of the town, the surface of which is hard and dry; it is to all appearance a very healthy place, but in reality one of the most insalubrious spots in Europe. Its summit attracted clouds during the night, and in the morning was enveloped in mist for several hours after sun-rise, which left an appearance on the ground as if there had been a heavy fall of rain; the hot sun succeeding, extricated noxious vapours from the earth during the remaining part of the day; and towards evening, there was generally a breeze from the land, which crossed the marsh, and conveyed the miasmata to Galleras. As soon as the sickness at Carthagena was known at Cadiz, an order was sent to withdraw the troops from the barracks in the town, for the purpose of avoiding the supposed highly contagious nature of the disease; the hard dry soil of Galleras probably induced the general to encamp them under the fort, where they were exposed not only more directly to cold during the night, but also to the influence of the effluvia from the marsh

as well as those extricated from the ground on which the tents were placed. I am convinced, had the troops remained in town, one half of the sickness would not have taken place."

This encampment, you will observe, took place in the autumnal season, and the objections stated to the position of the camp would probably not have operated, with equal force, at other periods of the year, although it affords a proof that elevation alone, independent of other circumstances, will not always ensure safety.

Having already hinted at what is peculiarly ineligible in the site of a camp, you will be prepared (whenever the ground for encampment is submitted to your judgment) to recommend a dry elevated situation, remote from marshes, swamps, stagnant waters, and from the immediate neighbourhood of orchards, forests, or underwood, calculated to retain moisture, contiguous to the camp. A camp is most advantageously situated on a gentle declivity, on a dry soil, and in the vicinity of a running stream. In order to ascertain the state of the ground, it may sometimes be necessary to dig into it to some extent, for although apparently dry on the surface, it may be found sufficiently wet at the depth of a few feet; and if so, ought, if possible,

to be changed, particularly if the encampment is to be stationary. A camp should never be formed on ground recently occupied, nor on a field of battle where much carnage has recently occurred. Many favourable spots for encampment are to be found on the banks of rivers, which perhaps, upon the whole, afford the most eligible sites. We must yet bear in mind, that when the banks of the river are low, or the country subject to periodical rains, or sudden inundations from the melting of snow on contiguous mountains, there may be a very serious danger from this cause. Against the danger of such a position we are cautioned in the following passage from Mezerey's "Medicine d'Armée." On aura soin sur tout de ne pas placer les tentes trop proche des rivieres et de torrens sujets à se deborder promptement ou a changer de lit, comme il arrive dans les pais qui sont dans les montagnes, ou a portée des montagnes fort élevées, dont les neiges venant a se fondre, ou de grand orages, peuvent entrainer tres-vites un camp, ainsi que je sais qu'il est arrivé en 1746, a celui des Autrichiens, placé entre Campo Marone et Gênes, duquel 500 hommes et 200 chevaux perirent de ces sortes de subites ou

presque subites crues d'eau, qui manquer d'emporter dans le mer toute leur armée.

When an encampment is inevitably situated in a low or unfavourable position, the kindling of large wooden fires in the windward parts of the camp has been recommended by Mindererus in his "Medicina Militaris," as contributing to preserve the health of the troops; and with the same view various modes of ventilating the tents have been recommended, some of which you will see described in a little work entitled "The Soldier's Friend," by Mr. Blair, formerly surgeon of the Lock Hospital in London; but as none of these plans have ever come into general use, nor indeed have been found requisite, I think it unnecessary to enlarge upon them here. The most obvious and perfect way of thoroughly airing the tents is by striking them occasionally, and exposing the straw, blankets, and soldiers clothing to the open air; the necessity of frequently changing the straw, and enforcing cleanliness in camp, in every possible way, are circumstances too obvious to require any effort of reasoning to convince you. With this view, the slaughtering of cattle, and any thing likely to create noxious or putrid effluvia, ought to be conducted without the camp, and on the side of

it opposite to that from which the wind generally blows. Every thing noisome or offensive should be immediately buried; a practice for which we have the most ancient authority, this part of camp police being distinctly enjoined by Moses in the 23d chapter of Deuteronomy.

Notwithstanding every precaution, filth is apt to accumulate in camp, and stationary camps for the most part soon become unhealthy. In such circumstances, it is consonant to all experience, that the most effectual step has always been a change of ground; a measure distinctly recommended by Vegetius—"Si autumnali æstivoque tempore diutius in iisdem locis militum multitudo consistat, ex contagione aquarum et odore ipsius fœditatis vitiatis haustibus et aere corrupto perniciosissimus nascitur morbus, '*qui prohiberi non potest aliter nisi frequenti mutatione castrorum.*'"

"It was a common remark with us in Germany," says Dr. Donald Monro, "that the troops kept their health much better when they moved about, and shifted their ground often, than when they remained long in a fixed camp; a remarkable instance of which we had in the end of the year 1760, for the men who remained in the fixed camp about Warbourg were very un-

healthy, while the regiments which were detached to the Lower Rhine, under the command of the hereditary prince of Brunswick, enjoyed a much better state of health; and notwithstanding their great fatigues, and the loss they sustained at the affair at Kampen, were much stronger when they rejoined the army in the beginning of February 1761, to go upon the winter expedition into the country of Hesse, than those regiments which had remained inactive in the fixed camp." Whenever, therefore, a camp becomes offensive or unwholesome from the accumulation of filth, instead of trifling or inefficient attempts to remove the nuisance from the camp, the proper remedy is to move the camp from the nuisance, and, if possible, to take up a position to windward of our former ground. For the accommodation of the sick in camp, the general regulations enjoin the propriety of obtaining, if possible, an adjoining house for their reception; and where this cannot be procured, every exertion is to be used to render the hospital-tent dry and comfortable, by cutting a trench round it, and boarding the floor with deals, when these can be procured.

While the foregoing considerations demand your serious attention in judging of the site of

camps, similar views will naturally influence your decision in recommending a site for the erection of barracks; but here every consideration naturally becomes more important in proportion to the expense, the durability, and the permanence of the establishment. Barracks well situated, well ventilated, and kept thoroughly clean, are eminently calculated to promote the health of troops; and in no other situation do we find soldiers, in general, so exempt from disease, while at the same time their concentration in these establishments facilitates their training, and subjects them completely to the wholesome surveillance of their officers. Dry, elevated situations, with an abundant supply of wholesome water, remote from the neighbourhood of swamps and of marshes, are the positions which a regard for the health of the troops would naturally induce us to select as the most eligible situations for the construction of Forts, and of Barracks: and it so far fortunately happens that the erection of these buildings on high or elevated situations may often be conducive to the defence of a country.

From Dr. Price's calculations, there is reason to believe, that, in hilly districts, *half* the numbers born live to the age of *forty-seven*, and that *one in twenty* reaches so far as *eighty* years

of age, while in marshy districts *one only in fifty-two* attains that period of life, and only *one half* the numbers born survive to the age of *twenty-five.* Nothing can more forcibly point out the advantages of elevated situations, and the fatal tendency of low ones, than the foregoing statement; and whenever a country is taken possession of by troops with a view to its permanent occupation, they cannot be too forcibly pressed on the attention of those in command. That they have not always been duly adverted to, may be inferred from the following energetic language of Dr. Jackson, applicable to the disposition of the troops in St. Domingo, one of the spots of all others most fatal to the British army: "It is mentioned, with regret, that the features of a country, as indicating health, have seldom been regarded in disposing of troops. The chief European force in St. Domingo, for instance, is allotted to towns and fortresses on the sea-coasts. The possession of a town, or niche of sea-coast, requires a very warm imagination to be converted into the conquest of a country. To those acquainted with the climate, the extent and internal resources of St. Domingo, and who have some knowledge of the qualities of those by whom it is at present occupied, such possessions

will not perhaps be esteemed a step of much progress. In the revolution of one season two-thirds at least of the European garrison will perish by disease; while the possession of a seaport, by which communication with foreign nations is cut off, will not much annoy a people who know to find their subsistence, and to supply their chief wants, from the productions of the soil. It appears in the medical history of the present war, that armies in Europe have been nearly destroyed by artificial disease. In the West Indies mortality has been great, and though the endemic be less avoidable than the contagious fever, yet it is evident, from a detail of the state of health in the different positions in St. Domingo, that the great loss has been chiefly owing to defects of arrangement,—to an injudicious disposition of the European forces."

After expressing his regret that such precaution has not been taken upon former occasions, Dr. Jackson goes on to recommend that, previous to the erection of forts and barracks, or fixing the cantonment of troops, a professional survey be made by a committee of military and medical officers, —that the advantages and disadvantages of the situation be fairly and fully estimated, and stated to the ruling power. From a survey of this nature it

is scarcely possible but that such lights will arise as may enable those entrusted with the direction of affairs to combine defence and convenience, with proper regard to the preservation of health.

The plan of assembling a board of health on the arrival of troops in a new or unknown country, thus recommended by Dr. Jackson, you will find very strenuously enjoined by Dr. Millingen in the "Army Medical Officer's Manual," where he has inserted a very judicious list of queries for the investigation of such a board. These queries, although all highly important, are too numerous, extended, and minute, to enable you to benefit by their enumeration here; the chief topics which they embrace are, the qualities of the soil, and the nature of its productions; the usual diseases of the country; the particular districts or provinces in which they are found most destructive; the seasons of the year, and the particular winds, which are reckoned most unwholesome; the particulars as to diet, mode of living, and temperance of the inhabitants, which are supposed to influence their health; and the modes of practice followed by the resident physicians.

Upon all these subjects much important information may be obtained from the old residents, or from the native medical practitioners

of a country, provided they are not hostile to your views, and under temptations to deceive you, a circumstance which should always be most cautiously guarded against. Native practitioners, if so disposed, may be enabled to point out in almost all countries particular spots, sometimes indeed of a very limited extent, which have, by a long train of observation, been found hostile to the human constitution, and which, of course, are to be avoided either for the temporary or permanent residence of troops.

In the construction of barracks, the two great objects to be kept in view are the means of *thorough ventilation*, and of *perfect cleanliness*, and with a due regard to these, every minor arrangement will be best submitted to the skill and experience of the scientific and accomplished officers of the engineer department; but upon the subject of ventilation so immediately and so essentially affecting the health of the soldier, I trust I may be indulged in a few remarks.

Ventilation implies a constant removal of the foul and frequently respired atmosphere, and the introduction of a fresh supply of air without exposing the inhabitants of an apartment to violent and irregular draughts or currents.

The indispensable necessity of this kind of ventilation in all inhabited buildings, but es-

pecially in those where numbers are collected, is so perfectly well known, that it would be superfluous to enter upon it here, were it not to advert to some errors in the common practice upon the subject, and to point out the means of obviating them.

The class of society from which soldiers and their wives are taken have an incorrigible aversion to the free circulation of air, a circulation which is rendered more necessary for them than for the higher ranks, in consequence of their less minute attention to personal cleanliness. In some cases the simple admission of air has been thought sufficient for the preservation of health, without in any degree regulating many important circumstances connected with its introduction; and although it may be questionable whether the diseases produced from currents, or excess of air, are capable of becoming contagious, (as those occasioned by its obstruction or confinement assuredly are) yet diseases of serious importance often spring from the former cause, and supervene upon, or are combined with those produced by the latter. To illustrate this by an example, I shall offer you the results of an investigation which was made several years ago into the causes of a

disease originating in the 4th battalion of the Royals, at that time quartered in Stirling Castle.

In the summer of 1811, a fever of a low typhoid nature broke out in the above battalion, which was then receiving daily accessions of strength from fresh recruits, and many of the rooms occupied by these men were excessively crowded. To this fever was superadded in many instances symptoms of violent inflammation of the lungs, constituting the *pneumonia typhoides* of some nosologists, a disease most perplexing in its treatment, and but too often fatal in its result. On investigating the circumstances of this fever and its peculiar symptoms, it was found, that in rooms, some of which were twenty-one feet by eighteen, and others thirty-one by twenty-one (the first class occupied by 60 men, and the latter by 72,) the windows were left open all night, which admitted a strong current of air to pass over the bodies of the men relaxed by sleep, and exposed at the sametime to the heated and concentrated animal effluvia necessarily existing in such crowded apartments; thus subjecting them to the combined effects of *typhus fever* and of *pneumonic inflammation*. In the less crowded apartments of the same barrack no instances of fever occurred, and even in the bar-

rack-rooms in which the disease appeared, it was uniformly traced to the men who lay in the direct current of the air, and on whose bodies it impinged with most violence, viz. those close to the windows on the entrance of the current, and those most remote from them, or towards its exit, the occupants of the intermediate beds generally escaping.

To ensure a due and regulated supply of air requires some address, for ignorance is as frequently conspicuous in its introduction as in its exclusion; and when left at the discretion of capricious, unthinking, or uncontrolled individuals, bad consequences may often ensue. It would be inconsistent with my purpose to review all that has been observed by others, or the vast variety of plans that have been proposed upon the subject of ventilation, I shall, therefore, confine myself at present to the most simple, the easiest of execution, the cheapest, the most permanent and uniform, and the least likely to be counteracted by ignorance or design.

The essential part of the mode of ventilation which I would recommend, is to convert the passages, lobbies, and staircases of a barrack or public building into spacious air trunks, or reservoirs, communicating directly with the external

atmosphere, and supplying the rooms adjoining them on either side, both by means of the doors opening into such passages, and by means of additional apertures made for the special purpose of ventilation. Thus at either extremity of the passages, there should be a window reaching from the ceiling to the floor of each story, the upper part capable of letting down, and the lower of lifting up, so contrived, however, as not to shut perfectly close at either top or bottom, but to leave a slit or aperture at least two inches wide, forming at all times a direct communication with the external atmosphere; and to prevent rain or snow from blowing directly through either of these slits there should be a slip of board or sheet iron placed obliquely over them. In fine weather these passage windows may remain open to any extent, giving the most unlimited access to the external air. In the centre of the floor of each passage (or if they are particularly long, at such other points as may be judged necessary,) an aperture should be made of at least two feet square, and covered with a strong iron grating, a corresponding aperture and grating being placed in each floor of the building, from the first floor to the garret, and in the roof a properly sheltered aperture or penthouse, so as to admit

the escape of the air outwards, while it effectually prevents the entrance of snow or rain. By this direct and perfect communication of all the passages with the external atmosphere, as well as with each other, a constant supply of pure and unrespired air will exist within the building; and to obviate violent or excessive currents, which may occur in particular barracks, (as those of Edinburgh Castle for instance,) cross doors in the passages, or at the foot of the staircases, might be judiciously distributed; the gratings in the floors being also supplied with covers capable of being partially or completely shut.

To place the passages thus prepared in action as ventilators, there should be placed over each of the doors opening from them into the adjoining apartments, a Venetian window reaching to the ceiling, while the door itself should not reach within an inch of the floor. But the principal dependence for a uniform supply of air should rest on means independent of the ordinary openings, and may be effected in the following manner. Into each room, on a level with the floor, let apertures be made of six or eight inches diameter, and from ten to fifteen feet distant from each other, communicating with the passage or main air trunk; and the same description and number

of apertures are to be made close to the ceiling corresponding with the unbored spaces of the lower range of air holes, it being observed that this upper row of perforations must be conducted through the exterior wall of the building, communicating directly with the external air, and so disposed as to prevent the access of rain or snow. By this means we provide for a constant supply of unrespired air from the passages or reservoirs by means of the lower range of perforations, while the respired and heated air is permitted to escape by the upper range.

It is obvious that in a room so ventilated, the inhabitants would not be exposed to direct currents of wind striking upon their bodies, for the entrance of the fresh air would be below their sleeping places, while the exit of the foul air would be above their heads. The heated and rarefied air would escape above, while that which was rendered specifically heavier by the accumulation of carbonic acid gas, and which consequently occupied the lower part of the room, would be constantly diluted and refreshed with unrespired air; indeed the more the atmosphere of an apartment thus ventilated, may be heated by respiration, or otherwise, the more certain-

ly will a circulation of air be established through it. The superiority of this plan over that where the ventilation depends chiefly or solely upon windows placed at the ordinary height from the floor is obvious; for they operate directly only upon the purest part of the air of a room, viz. the middle-layers. In rooms again which are ventilated by wooden air trunks in the ceilings, these trunks are ever liable to be closed up by rags, which the soldiers and women stuff into them in such a way as to elude the eye; they are sometimes very ingeniously closed by means of pieces of old leather, and sometimes more palpably by means of paper pasted over the holes in the trunks, practices to which the men are more frequently found to resort in rooms with windows sliding horizontally, than in those opening perpendicularly from above and below, owing to the less manageable currents of wind produced by the former.

A great advantage of the plan of ventilating which I have endeavoured to recommend to you, is, that it does not interfere in any degree with the means already established, and that it may be introduced at a very trifling expense into buildings already erected for barracks, or occasionally occu-

pied as such. By means of it also, small inner rooms and closets, or the rooms in double buildings, may by very simple contrivances be made to communicate with the external air, and may be rendered independent of the supply which they sometimes receive in a heated and tainted form by communications with the adjoining rooms; a defect particularly obvious in the construction of the infantry barrack at Glasgow. But the great and leading advantage which attends the mode of ventilating barracks by means of the air occupying the passages and lobbies is, that we have the supply completely under the control of the military or medical officer at all times and in all seasons, constantly existing within the building itself, let the storm rage how it may without. This is a period, which in buildings with the ordinary doors and passages, is always unfavourable to ventilation, by driving the soldiers, their wives, and children into the barrack rooms, and inducing them to close the windows and every aperture, by which fresh air can be admitted.

Before concluding this subject, I have only to observe that the mode of ventilating barracks by perforations in the walls and passage floors, is merely a modification or extension of the plan of ventilating hospitals recommended by Dr. Donald Mon-

ro, in his "Health of Soldiers," so long ago as 1762; and of its practical utility, examples are to be found in the Bristol Infirmary, fitted up on the suggestion of the late Mr. Howard, and in the wards of some of the temporary barrack hospitals in England; amongst others which I have seen was that at Hastings in Sussex: while in foreign countries, several examples are to be found of barracks, hospitals, and workhouses ventilated in the same way; thus the Caserne of St. Elizabeth at Brussels, the Hospital of the Jesuits in the same city, and the Workhouse at Amsterdam.

In guardhouses, which are frequently crowded with prisoners and overheated, and which are furnished with fixed bedplaces not admitting of a free circulation of air under them, the perforations on a level with the floor and with the ceiling should never be omitted. The same should be introduced into blackholes, and other places of confinement, which frequently prove sources of much more severe punishment than they were ever intended to be. In barrack necessaries the due admission of air is seldom sufficiently attended to by architects, insomuch that offensive and noxious vapours are accumulated and retained, while the detection of the most palpable filth is but too often rendered difficult by the want of

a sufficiency of light. In cases where it is necessary, for the sake of admitting light, to have windows opening into close or inaccessible areas, it would be well that such windows were invariably placed at such a height from the floor, and so grated over as to prevent dirty or indolent soldiers from throwing out filthy or offensive matters into places whence they cannot easily be removed.

It is quite unnecessary, I conceive, to enlarge upon the subject of cleanliness in barracks, or to dwell upon its inseparable connexion with health. I would merely advert to a few circumstances necessary to be kept in view, in the establishment of an uniform and accurate system, for its introduction and preservation.

The system of dry scrubbing for cleaning the floors of barracks has now universally taken place of that system of frequent washing, in all weathers, which formerly existed, and which in many instances was found injurious to the health of the soldiers; but there are certain circumstances under which washing with soap and hot water, or scouring with sand, may still be requisite; this is particularly applicable to the cleaning of those cumbersome wooden masses of frame-work, which are to be met with in some barracks in the form of

bedsteads. Wherever iron, or a lighter description of wood work can be introduced, cleanliness will be essentially promoted, and even ventilation assisted; for those unwieldy articles often seriously obstruct the circulation of air, and even materially diminish the cubical bulk of it contained in a room. The bottoms of the bedsteads, particularly of the lower tier, when these articles are double, should be made to lift out, or to move aside with a hinge, so as to admit of effectually cleaning under them; they should always be fixed at a few inches distance from the walls, and never huddled together, or forced into corners and recesses as they often are. In rooms perforated as I have proposed, the bedsteads should be placed, relatively to the perforations, in such a manner that the air beneath them should be constantly changing, and its current directed along the floors and walls. This may be done either by placing a bedstead over each air hole, or where an air hole comes in the interval between two beds, placing a slip of board or sheet iron before it, in such a manner as to force off a portion of the air laterally, so as to sweep along the bottom of the bedframe.

The white-washing of barracks and hospitals is a subject of considerable importance, and I have

often seen occasion to regret the obstacles to its accomplishment; the delays and difficulties in getting the work commenced; the tedious and slovenly manner in which it has been proceeded in; the insufficiency with which it has been performed; and the unnecessary expense to the public with which it has been attended.

In a much shorter period of time, and at an expense much below the usual estimates, barracks and barrack hospitals might be effectually white-washed by employing soldiers for this purpose, to whom the necessary materials should be furnished; and in the case of hospitals at least, (if it should not be deemed eligible to extend the same useful and economical plan to barracks) a charge for brushes, lime, &c. might be allowed in the hospital accounts, thus enabling the surgeon to have his hospital white-washed, without a moment's delay, whenever it may become necessary; instead of compelling him to have recourse to the slow, unsatisfactory, and expensive process usually adopted for that purpose, by means of returns and requisitions, signed and countersigned, sent in in duplicate or triplicate, returned perhaps for alteration or amendment by a capricious barrack-master, or submitted to his

superiors by a timid one before he will undertake the work.

In barracks, it not unfrequently happens that the contractors do not remove the straw, offal, &c. until a large accumulation has taken place; and this not from inadvertence, but with a systematic design of ameliorating the quality of the manure. Such accumulation should always be prevented, and the terms of the contract rigidly enforced, or amended if they have been defective.

Some of you may possibly have observed in the newspapers of the day, that on a recent court-martial in Ireland, before which an officer of rank was tried for having inflicted corporal punishment on his men in an unprecedented manner; the evidence of the surgeon went to show that the consequences accruing from this punishment were aggravated by the exhalations from a large dunghill contiguous to the regimental hospital.

The cleanliness of barracks and hospitals, as well as the personal cleanliness and comfort of the soldier, have been most materially improved of late years, under the excellent and paternal regulations of his late Royal Highness the Commander-in-Chief. These regulations have been crowned with ample success in the unparalleled

health of the army, shewn by the infrequency of many diseases which formerly raged in it, and by the probable prevention of others ; so that the most rigid attention becomes due both to the letter and spirit of the present improved military code.

In proof of the superiority of barracks to every other accommodation as connected with the health of troops, I beg leave to conclude these remarks by reading to you the following observations from Dr. Brocklesby's excellent "Observations on Military Hospitals, and on the Diseases of Soldiers." "The general use of barracks is a subject of so great importance, that it cannot be sufficiently enforced. How is it possible for the men of each company, scattered up and down the ale-houses of a great town, ever to be regularly messed together? How is it possible without barracks to make a private soldier always wholesome and cleanly, farther than at a stated hour on the parade for momentary show? The day of battle is once or twice in a long campaign, when men must be used as they are wanted ; but an attention to the well-being of the men, and the preservation of their health, ought to be a constant serious business, and an unceasing care of their officers, as well as

of the doctor. Until I see the establishment of such barracks throughout Great Britain, it were vain to expect that any regiment can be trained to that perfection of health and force of interior discipline which is necessary."

"Thus far I thought it consistent with my plan to express myself in favour of barracks as necessary to save the lives of numbers of men unprofitably and needlessly lost in this country. I conceive, by the establishment here mentioned, and by the care of the field-officers, always effectually aided by an intelligent medical person in each battalion, any old regiment may be ever ready to take the field on the shortest notice, and when ordered on duty, would prove more healthy than any new-raised corps hardened by two years encampment."

Dr. Brocklesby goes on to observe, that while he thus urges the establishment of barracks on the most honest and humane of all principles,—"the necessary care of men's lives;" he deprecates the construction of some of the older barracks in this country, particularly those at Hilsea, near Portsmouth, "built with salt water bricks, and fitted up with low ceilings, and without ventilation. Such barracks," says he, "are worse for the inhabitants than any tolerably clean king's

ship riding at anchor in harbour or at Spithead." Those who, like myself, have been quartered at Hilsea will admit, that the objections above stated were applicable to the barracks there even within a very recent period; and I have thought it right to bring to your notice these observations of Dr. Brocklesby, to show you what just opinions this distinguished physician entertained of what was most objectionable in the construction of barracks; and how far they are calculated, when well constructed, to promote the comfort, health, discipline, and efficiency of the troops.

Of billets, the next means of accommodating the soldier which I shall notice, I have nothing whatever to say in favour, but, on the other hand, to express the most unqualified condemnation, in so far as the health of the troops is concerned. They remove the soldiers in a great measure from the wholesome surveillance of their officers; they give them opportunities of indulging in dissipation, and throw them in the way of many temptations to which in a barrack they are not exposed; they lead to relaxation in discipline highly prejudicial to the health of a soldier, and to neglects and oversights when sick, sometimes attended with the most fatal consequences. The distress to the individual, the disad-

vantage to the surgeon, and the injury to the service which attends the billeting of soldiers, seems to have been severely felt, and are pathetically lamented by Dr. Hamilton in his work on the "Duties and Qualifications of a Regimental Surgeon," published in 1787. "The billets in England, and, I may add, in Scotland, are always in public houses; and the landlord never fails to look on the soldiery not only as a nuisance, but as a great drawback on the profits of his business. They are treated coldly and frequently lodged poorly. The places allotted for them are generally some uninhabited garret or lumber room, where the very air they are obliged to breathe is so vitiated as at first entrance considerably to affect a person unaccustomed to it.

"If the landlord has no garret he has perhaps some back-house, where he erects a few dirty beds. Such places are set apart for the soldiers because fit for no other use. The clothes on their beds are frequently so scanty and so much worn, as even in summer to be almost unfit to keep them warm, and should it happen to be cold winter weather, altogether insufficient. This often brings on catarrhal affections, and lays the foundation of other more violent diseases of the

inflammatory kind, not unfrequently ending in death.

"It must be obvious that this will affect the surgeon in his practice, for we need not add, that while the cause exists the disease must continue. The most judicious plans of practice may be laid down, but, under such circumstances, it will be next to impossible they can prove successful.

"That this is a true state of the fact many a poor soldier can testify, and in my professional visits to them what I have too often had occasion to lament, the more so as it was not in my power, in this respect, to afford them relief. The truth is, that many a prisoner in his cell is better lodged than we find many of the soldiery in billets, yet will they seldom complain if their situation be at all tolerable. If complaints, indeed, are made to their officers, redress, so far as can be had, is given. A message is sent to the billet-master to desire him to change the billets of the soldiers so treated, or oblige the publicans to furnish them with better accommodation; but this is seldom productive of much good; for should the magistrate interpose, which sometimes is the case, and the landlords be reprimanded, perhaps fined, and thus compelled to give them

better usage, ill-nature generally takes place on both sides; the landlord and his family still prove haughty; the soldier retorts it by behaving improperly, and taking every stolen opportunity of committing misdemeanours. Thus neither party is pleased. The landlord abuses the soldier, the soldier the landlord. Those necessaries with which he is obliged by law to furnish the soldier are not only given with reluctance, but are often of the worst quality."

I could wish, Gentlemen, that my own more recent experience would enable me to give a different picture of the disadvantages attending the billeting of soldiers throughout England, but these, as pourtrayed by Dr. Hamilton, are in every particular, so perfectly coincident with my own observation, that I could not but choose to adopt every syllable which he has written upon this subject. And the Courier newspaper of this very day, (7th November 1829), contains a correspondence between the magistrates of Chester and the Secretary at war, tending to show that the mutual grudge, discontent, and heart-burning which have long existed in this country between the soldiery and the innkeepers, are not yet at an end.

Of the fatal consequences which sometimes occur from the practice of billeting soldiers, one

of the last cases which I had occasion to treat in the service afforded a melancholy example. A fine healthy young soldier, of the 33d regiment, then occupying billets in the town of Nottingham, was severely injured in a drunken brawl, and received several contusions on the head. He was brought to the hospital, labouring under violent symptoms of phrenitis, which, in spite of very active treatment, proved fatal in a few hours after his admission. On examining the head, the cause of his death was sufficiently conspicuous, a considerable quantity of matter having already formed on the surface of the brain; but I was extremely puzzled to account for the rapid termination of this case, until the circumstances were developed before a coroner's inquest, when it turned out that the fatal injury had been received *several days* previous to his appearance at the hospital, and that his comrades, and the people in his billet, desirous of hushing up the whole affair, had kept him concealed, and had been treating him with hot ale and with gin. To this a facility was unfortunately given, from the young man having been employed in manufacturing tufts for the men's caps, and having in consequence been excused from parades. On my examination be-

fore the coroner, and subsequently before the grand jury, I took occasion to state, that the man's death did not appear to me so much the result of the severity of the injury, as of the mismanagement and want of timely medical assistance after it,—a mismanagement which never could have occurred in barracks, where no man could have lain many hours without having been observed by an officer or non-commissioned officer, and of course ordered to the hospital. In consequence of my evidence, the bill of indictment was thrown out by the grand jury,—a step of which Sir William Garrow, the presiding judge, highly disapproved, for, although the circumstances were such as to do away the probability of a deliberate intention to murder, yet he thought that the parties concerned in the affray ought to have been put upon trial for their lives.

Billets, however, notwithstanding the objections I have pointed out to them, become, in many cases, the only accommodations to be procured for soldiers; and, in such cases, it is the duty of the surgeon, as far as his more urgent avocations will allow, to visit the different billets of his men, particularly such as may be reported to him as damp, deficient in point of ventilation, cleanliness, and comfort; and when he finds them

so, it becomes his imperious duty to make an immediate and distinct report to his commanding officer on the subject.

Before concluding these observations, I may be permitted to remark, that, amongst people not practically acquainted with the comparative advantages of barracks and of billets, specious declamations are not unfrequently entered into against the former, and in favour of the latter. Barracks are represented as tending to estrange the soldier from the citizen; while, on the other hand, we are told that billets are calculated to associate them more intimately, and to encourage a spirit of patriotism amongst the troops. I will venture, however, to affirm, that (to a certain extent) the farther the soldier is separated from the habits of the citizen, the better soldier he will become; and whether lessons of patriotism, or democratical harangues, will be read to him in his billet, depends entirely on the temper of the times.—Looking solely to his health, which is the only legitimate object of our consideration, I have no hesitation in asserting the superiority of barracks; and in this opinion I believe I am supported by every experienced medical officer.

Having offered these cursory remarks on the accommodation of troops, it now only remains

for me to advert to what may be attempted for their comfort in those urgent circumstances in which they are totally without accommodation, and without shelter, when they are under the necessity of bivouacking. And here I believe that everything which can reasonably be devised is comprehended in the following extract from Dr. Millingen's book :—

" In selecting ground for bivouac, little can be remarked ; as it is merely necessary, that, in this temporary situation, the site should be healthy, and in the vicinity of wood, water, and straw, if possible. It is in this harassing situation, more especially in cold and wet weather, that hoods attached to the great coats will be found of material benefit.

" When military circumstances permit it, fires should be kindled ; and when a general does not wish to show an extensive front, they should be lighted in circular clusters, that the men may lay between them, and the heat be more generally diffused ; amidst these, the troops should lay, not singly, but by squads, spreading two or three blankets on the ground, over straw or fern leaves, &c. when it can be procured : their heads covered with their hoods, their ears previously protected by the flaps of their forage caps ; their

feet converging towards the fire; their heads supported by their packs. They should lay close to each other, covered with the rest of the blankets; in wet and cold weather, a half ration of spirits should be issued previous to their retiring to rest.

"In very cold weather, sentries should only be kept on an hour, or even half an hour; and when relieved, the men should not be permitted to lay down immediately by the fires, but be kept pacing round them, till the sensation of numbness is relieved. Under similar circumstances, only one-half of the troops should be allowed to lay down at a time, the other half being kept in motion round the fires, with orders to awake their comrades after two hours' sleep, that they may rest in their turn.

"When sleeping on the snow-covered ground, the men had better pile up a heap of snow on each side of them; these banks will afford a comfortable protection. Under these circumstances, incredible comfort will arise from anointing the face and ears with oil before retiring to rest or going upon duty.

"On arriving on the bivouac ground, the sick should be put under canvas, or accommodated in adjoining buildings, each corps assembling its

sick in the rear of its centre. Here also should encamp the medical officers, with the ambulance; the horses picketed, ready to be put to at a moment's notice."

LECTURE IV.

In introducing to your notice the subject of military hospitals, and attempting to trace the successive steps by which we have been led to the formation of establishments considered so indispensable in the armies of modern Europe, it is much to be lamented that we possess little or no detailed information regarding the provision made for the treatment of the sick and wounded in former times.

It is certain that ancient Rome, however magnificent in other respects, had no houses into which sick persons were admitted in order to be taken care of and cured. Diseased people were, indeed, carried to the temple of Esculapius, and there waited for a cure; but it does not appear that any preparations were made for their accommodation, or any professional means employed in their treatment: those nu-

merous benevolent institutions for the indigent and sick, which do so much honour to modern times, were first introduced by Christianity. The care of procuring the necessary assistance to those sick persons who can expect no help and attention from individuals, belongs to the police, and ought at all times to have been provided for by rulers and sovereigns; but, in the oldest periods, it appears they had too much to do in administering justice, and securing the state against hostile attacks, to be able to attend to this necessary establishment.

Although, in many ancient nations, the soldiers served voluntarily, and without pay, in the hope of acquiring by plunder a sufficient compensation for the expenses, labour, and dangers to which they were exposed in war, yet it remained a duty incumbent on the government to provide for soldiers incapable of further service, and destitute of support,—a duty enjoined no less by the dictates of humanity, than by political prudence, in order that others might not be deterred from entering into the service of their sovereign or their native country, but rather, by the confident hope of a future provision, might have their energies increased, and their fidelity confirmed. The justice of this principle

seems to have been fully acknowledged, from the most remote periods; in the Stratagicum of Mauricius we meet with the following remark:—"*Vulneratorum magnam haberi curam æquum est.*" And we are informed that Solon deducted something from the pay of soldiers, and employed it for the education of children whose fathers had fallen in battle, that others might be encouraged to bravery; while Pisistratus, acting on the same principle, made an order, that those who had lost any of their limbs in war should be maintained at the public expense.

The Romans recompensed their deserving and disabled soldiers, by awarding them honours, privileges, and pecuniary pensions. A veteran was authorized to carry a cane, like a centurion, when he entered a camp; and when guilty of a misdemeanour, he was not liable to be flogged, or to suffer any ignominious punishment. Constantine awarded to veterans, waste lands in perpetuity, with an exemption from imposts. Each individual received a pair of oxen, a hundred bushels of grain, and a sum of money to enable him to purchase agricultural implements.

The pensioning of soldiers, on account of long service, or in consequence of being disabled by wounds, is indeed a highly just and politic mea-

sure, and the states of Greece and of Rome early saw the necessity of adopting this means of improving their military force. As yet however we find no notice of anything like our modern establishments for the treatment of the wounded, and of those labouring under acute forms of disease, excepting, indeed, the Valetudinarium of the Roman camp; which you will see figured in Grævius's Roman Antiquities, but of the nature and regulations of which we possess, so far as I know, no detailed nor perfect account.

One of the first houses for the reception of indigent sick, was that built at Rome by Fabiola, a Roman lady, the friend of St. Jerome, and who consequently lived in the fifth century. It is nevertheless true, that these older hospitals were not properly established for sick, but rather for the poor; and hospitals, according to the meaning of the word at present, that is, such as were destined for the sick alone, were not introduced before the eleventh century. It is recorded in the life of St. Lanfranc, who was archbishop of Canterbury in the year 1070, that he caused an hospital to be built there, and fitted up so, that one part of it was appropriated for the reception of sick men, and the other of sick women. It

is probable that this prelate formed the institution here mentioned after the model of those which he had previously seen in his own country, Italy: and, after this period, similar establishments for the sick are mentioned in various other parts.

Of the internal economy of the oldest houses for the reception of the sick, I believe that no accurate information is to be found; it is not even known whether physicians and surgeons were appointed to them, nor in what manner they were supplied with medicines. In the hospitals at Jerusalem, the knights and brothers attended the sick themselves, bound up their wounds, and acted as their physicians, in imitation of the Grecian heroes; and Möhsen remarks, that the well-known *baume de commendeur* is one of the oldest compositions belonging to the times of knighthood. Profound or extensive knowledge of medicine could not be expected amongst these warriors, even if we were ignorant of the account given of their skill by Guy de Chauliac, who wrote his book on the healing of wounds in the year 1363. This author mentions different medical sects, and amongst these names the German knights as the fourth sect, who, he says, cured

wounds by exorcism, oil, wool, and cabbage leaves.

The first regular establishment for the reception of invalids which occurs in history is that formed at Constantinople by the Emperor Alexius Comnenus, at the end of the eleventh century, a complete description of which may be found in the history of that prince, by his learned daughter Anna Comnena. The emperor caused a number of buildings standing around a church to be fitted up as an hospital, into which were received sick and indigent persons of both sexes, and of all ages, and, as the female historian expressly states, soldiers dismissed from service were admitted into it, and provided with bed, board, and clothing.

Of the hospitals for invalids at present in existence, the oldest and largest, is that established at Paris. The kings of France enjoyed from the earliest times what was called *droit d'oblat*, which consisted in the power of sending to abbeys and monasteries, in order to be maintained, officers and soldiers unfit for further service, and particularly such as had been wounded. It may be readily conceived how unpleasant these guests must have been to the clergy, and how little the

ideas, mode of living, and manners of these two classes, would accord with each other. The complaints on this subject had become so great under Henry IV., that he, at length, resolved to cause all invalids to be lodged and maintained together in a palace, called *la Masion Royale de la Charite Chretienne.* But as the revenues destined for the support of this establishment were not sufficient, it was abolished under the same sovereign, and the invalids again distributed amongst the abbeys and convents. In the course of time these houses purchased exemption from this burden, by giving an annual pension to their guests, who soon spent their money, and then fell into a state of the most abject poverty. On this account Louis XIII. renewed the experiment of founding an hospital for invalids, which, for want of money, was never completed. At length, Louis XIV., in the year 1670, commenced the present magnificent *Hotel des Invalides.*

In the same year, 1670, James II. of England commenced the hospital for invalid soldiers at Chelsea; and the larger and more magnificent hospital for seamen at Greenwich, (first suggested by Mary the consort of King William,) was begun in 1695, and from time to time enlarged and beautified.

The first traces of field hospitals, or as they are often called, flying hospitals, occur, perhaps, in the east. At any rate the Emperor Mauricius, in the sixth century, had along with his armies *deputati*, (Δαιποτατοι,) whose duty he describes; as had also the Emperor Leo VI., in the ninth century. These deputati were distributed in the armies among the cavalry, and were obliged to carry off those wounded in battle. On this account they had on the left side of the saddle two stirrups, in order that they might more easily take up the wounded behind them; and for every person thus saved they obtained a certain reward. They were obliged also to carry with them a bottle containing water, for the purpose of reviving those who might have fainted through loss of blood.

Although an order was made by the first council of Ratisbon, in 742, that every commander of an army should have along with him two bishops, with priests and chaplains, and that every colonel should be attended by a confessor, no mention is to be found either of field hospitals or of army surgeons belonging to the first Christian armies in the writings of the middle ages. We learn, indeed, from the works of Paracelsus, Thurneyser, and others, that they were present

at battles and sieges, but they certainly were not appointed as army surgeons, and served merely as soldiers. The field surgeons who occur as accompanying armies in the beginning of the fifteenth century were destined rather for the use of the commanders and principal officers than for the service of the field hospitals. Their number was too small for a whole army; and as they were authorised by their commissions to receive prisoners and booty, and, like the knights, were obliged to bring with them archers, it is highly probable that to fight was a part of their duty also.

Harte, in his Life of Gustavus Adolphus, seems to believe, that this prince first appointed four surgeons to each regiment, which he reduced from the number of 2 or 3000, first to 1200, and afterwards to 1008; and Harte is of opinion that the imperial troops, at that time, had no surgeons, because Tilly himself, after the battle at Leipsic, was obliged to cause his wounds to be dressed by a surgeon established at Halle. He adds, also, that the Austrians, till about the year 1718, had no regimental surgeons regularly appointed. However this may be, it is certain, that the field hospital establishments of the imperial army, till the beginning of the 18th century, were on a very bad footing. Even in the year 1718, they

had no field surgeons; but at this period the company surgeons were dismissed, and a regimental surgeon, with six assistants, was appointed to each regiment; and besides the field medicine chest, surgical instruments were provided at the emperor's expense.

The establishment of field hospitals in Germany, would appear to have been of a much older date, for Fronsperger (who wrote in the middle of the 16th century) does not speak of field surgeons, army surgeons, and their servants, as if they had been then newly introduced; but in such a manner as shows that the need of them had been generally acknowledged and supplied long before that period. According to his statement, it was necessary that there should be, along with the commander in chief, a field surgeon in chief, a doctor, who had the inspection of the field surgeons, the barbers, and their servants, whose duty was to drag the wounded from the heaps of slain, and to convey them to the former. He was obliged to keep by him instruments and medicines, and at each muster to examine the instruments and apparatus of the field surgeons; he decided also, in disputed cases, how much soldiers, whose wounds had been cured, ought to pay to the field surgeon; and

during marches, he was bound to remain with the commander in chief. Fronsperger says, also, that there ought to be with the artillery a general field surgeon, and with each company, a particular field surgeon, not, however, a paltry beard-scraper, (bartscherer) but a regularly instructed, experienced, and well practised man.

Field hospitals were first established in France under the illustrious Henri Quatre at the siege of Amiens in 1597, and the benevolence of the institution was so gratefully acknowledged by the soldiers, that they distinguished the campaign in which they were established, by the name of the *velvet campaign*. Humanity to the wounded, seems, even long prior to this period, to have been a trait conspicuous in the character of the French monarchs, St. Louis himself, the ninth king of that name, having personally assisted in the cure of the soldiers, whose wounds were the consequences of the wars undertaken for the purpose of expelling the infidels from the Holy Land, or of his contests with our Henry Third.

In Rymer's Fœdera, we are told that when Henry Fifth of England carried on war with France in 1415, he took into his service Nicholas Colnet as field surgeon for a year. He was

bound to carry with him three archers on horseback, and to accompany the king wherever he went. In return, he was to receive, yearly, forty merks, to be paid at the rate of ten merks every quarter. He was allowed also twelve pennies per day as subsistence money, and each of his archers had twenty merks a year, and six pennies daily for subsistence. The chief army surgeon, Morstede, was engaged with fifteen men, three of whom were to be archers, and the remaining twelve, surgeons. Both Colnet and Morstede could receive prisoners and plunder; but when the latter amounted to twenty pounds in value, a third part of it was to be given to the king. These head-men got each a quarter's pay in advance; and that they might always have security for the next quarter, the king engaged to put into their hands, by way of pledges, as many jewels, or other articles, as might be equal to one quarter's pay and subsistence.

Although we are thus furnished with a very precise account of the compact entered into between Henry Fifth and his surgeons, I regret to say, that I am unable to refer you to any accurate or detailed account of the first introduction and establishment of regimental hospitals in the

English army, to which the service is now indebted for so much of its efficiency. The appointment of regimental surgeons was, indeed, coeval with their corps, but at what precise period it became customary for them to provide houses for the reception of the sick, and to treat them collectively in such receptacles, I have not been able to ascertain; although these institutions were certainly prior to the time of Monro, and Brocklesby, as may be inferred from every page of their writings.

Dr. Donald Monro, who seems to have searched the ancient writers with great care, for information on the subject of military hospitals, and for the means of accommodating the sick and those wounded in battle, reports, that no ancient author, either historian or physician, that he had met with, makes mention of the particular manner in which their military hospitals were conducted. We know, indeed, from the writings of Livy, Tacitus, and others, that it was the custom in ancient times, to entrust the wounded, after great battles, to the hospitality of the neighbouring gentry, into whose houses they were received, a practice certainly very inconsistent with efficient medical treatment; for, to say nothing of the impossibility of visiting sick sufficiently often, when

thus dispersed, the hospitality of their entertainers would, no doubt, often be exercised to a very injurious extent. Dr. Monro, however, says nothing of the first establishment of military hospitals, either fixed, or moveable, general, or regimental, in the British service, but speaks of them both as well known in his time. "In times of war," (says he) "when the regiment is ordered on actual service, the surgeon and his mate always go with it, and their duty is to take care of the sick and hurt in their own *Regimental* hospital; and in spring or summer, when the regiment takes the field, they encamp with it, and have generally some tents pitched in the rear of the regiment, for the reception of such as may fall sick, till an opportunity offers of sending those ill of fevers, fluxes, or other dangerous disorders, or who have received bad wounds, to the nearest *General* hospital."

Of the wretched accommodation provided for the sick soldier, even so late as the time of Dr. Brocklesby, you may take the following picture in his own words. After pointing out the evils arising from the accumulation of great numbers of sick under one roof, he observes, that "Another sort of regimental infirmary, which frequently is as bad as a large crowded hospital, and which I

have most objection to, is as follows:—A small old house, with low ceilings; a large kitchen or common room below stairs; and no other apartment in the house half so big as that kitchen; small lozenge windows without apertures, designed to keep the inhabitants warm in lieu of fire. Most commonly, the habitation hired for an infirmary has for sometime been altogether unoccupied, with the walls all damp, the boarded floors half rotten, and the roof in several parts open above. In a few words, at best, it was a desolated habitation, unfit for containing a wretched family of seven or eight people, and now destined to hold the sick of a whole regiment. I have, indeed, seen such a cottage stuffed with forty, fifty, sixty, nay with seventy or eighty poor sick soldiers, all lying heel to head, so closely confined together within their own stinking clothes, foul linen, &c. that it was enough to suffocate the patients as well as others who were obliged to approach them." And Brocklesby elsewhere observes, that to the important subject of Military Hospitals, neither Montecuculli, Folard, Feuquieres, the great Conde, Marshal Saxe, General Bland, nor any other writer with whom he was acquainted, had paid much attention; for officers in this respect conceived

that they had little more to do, than to consign the sick to the best of those accommodations which chance, necessity, or a base parsimony, had provided for them; and hence, says he, "it hath come to pass that when every other branch of army arrangements besides that of military hospitals is already digested into a method, and approaches very near to science and to system, yet still every service in Europe labours under unspeakable inconvenience in this particular department, especially at the commencement of a war; the directors acting too much upon temporary shifts, and never having yet sufficiently preconcerted measures so as to give the suffering soldier, or the judicious officer, content and satisfaction."—How completely this reproach is taken away by the arrangements of the present time many of you are sufficiently well informed; and I now proceed to advert to some of those points most deserving your attention in carrying those arrangements into effect.

The remarks already made on the site, construction, and ventilation of barracks, for the most part apply *a fortiori* to military hospitals, and hence these points need not detain us long. In the barracks of this country, both those of a temporary and permanent nature, an hospital sufficiently commodious,

airy, and well ventilated is generally provided, and these are such as to afford the surgeon every advantage in the treatment of his sick; but when employed in a foreign country, it becomes a most essential part of the surgeon's duty to select and appropriate, under the authority of his commanding officer, such houses as are best adapted for the reception of the sick and wounded. In large cities and towns where the principal establishments of an army are formed, hospitals belonging to the country are to be found; but even if justice and humanity entitled us to turn out the wretched inhabitants of such abodes, it is not always that they could with safety be appropriated to our purposes, from the nature of the diseases prevalent in them.

For hospital establishments in general the larger public buildings of a city are to be selected; in Roman Catholic countries, monasteries, colleges, &c. are to be found highly adapted to this purpose, and, in many instances, palaces, spacious houses, barracks, granaries, &c. may be well employed for the reception of the sick. Churches, which have been sometimes used for this purpose, are less eligible, particularly when the practice of the country permits the burial of the dead within their precincts. When we have an opportun-

ity of making a selection we will naturally give the preference to buildings constructed on elevated and dry ground, with a favourable aspect, and an abundant supply of wholesome water. When in a low country, care should be taken as far as possible to prevent the hospitals from being exposed to marshy exhalations; and in such situations the lower floor of a building should not be occupied by the sick if it can be avoided. The superior degree of health, frequently existing in an upper floor of the same barrack, while the men on the ground floor are suffering from disease, has often been remarked; several instances of this are noticed by Sir John Pringle, particularly amongst the troops quartered at Ghent, in 1742, where it was observed, that such as lay in the upper stories enjoyed much better health than those who were below on the ground floors, which were all very damp.

In a very interesting and valuable paper, on the "Nature and History of the Marsh Poison," by Dr. William Fergusson, published in the Transactions of the Royal Society of Edinburgh, he observes, that "No experiments hitherto made have enabled us to pronounce whether it be specifically heavier or lighter than common air; but it evidently possesses an uncommon and sin-

gular attraction for the earth's surface; for in all malarious seasons and countries, the inhabitants of *ground floors* are uniformly affected in a greater proportion than those of the upper stories. According to official returns during the last sickly season at Barbadoes, the proportion of those taken ill with fever, in the lower apartments of the barracks, exceeded that of the upper by one-third, throughout the whole course of the epidemic."

Of this exemption from disease in the upper floor of a barrack while it raged below, a very remarkable instance fell within my own observation in the 69th regiment, at that time quartered in the fortress of Seringapatam, and occupying a building which had formerly been one of Tippoo's palaces.—I recollect also in the large hospital at Sourabaya in the Island of Java, (one of the best hospitals I have ever seen,) we used to remark the more rapid convalescence of patients upon the upper floor. Indeed the lower story of this building was very judiciously appropriated to the necessary offices of the establishment, and but a small portion of it was occupied by the sick. Of the numerous examples which could be pointed out of the fatal effects of inattention to the proper situation of hospitals, especially in tropi-

cal climates, two very remarkable instances are recorded in Dr. " Monro's Health of Soldiers," already often referred to.

" The situation ought not only to be dry and airy, but likewise at a distance from large woods and marshes, and out of the draught of winds which come over such grounds, otherwise the hospitals will often be unhealthy ; a remarkable instance of which the late Dr. John Hume told me that he saw at Jamaica, in the year 1741, while he had the care of the naval hospital there. The hospital in the beginning of the war was at the town of Port-Royal, situated on a sandy bay, exposed to the wholesome sea breezes, and at a a distance from woodlands and morasses ; and the patients in it were very seldom attacked with remitting or intermitting complaints. In the course of the war the sick became numerous, and the government ordered a new, large commodious hospital to be built, about four miles from the town, on a dry spot of ground, clear of woods, and which rose, by a gradual ascent, for about a quarter of a mile from the sea ; but unfortunately, it was full in the draught of a land-wind, which came over a large extensive marsh, on the banks of a fresh water river, at about the distance of two miles. This circumstance ren-

dered the hospital so unhealthy, that not one man in a hundred, who remained three or four weeks in it, escaped remitting or intermitting fevers, and even the marine guard, who were relieved once in the fortnight, or three weeks, fared no better. On Mr. Hume's representation of the state of this hospital it was deserted, and another built at Port Royal.

"Another instance of the same kind was related to me in July 1771, by J. Graham, Esq. who has an estate in the island of Grenada. Soon after the British troops took possession of the island at the end of the late war, a party of soldiers was sent to lodge in some houses of a Mons. Rochard's plantation, which was situated on a dry rising ground, and on the windward side of the island, and therefore believed to be a very healthy situation. All the men of this party died, which was attributed to their having marched twenty-two miles in one day, in order to reach this place. A second, and a third party was successively sent to take up the same quarters; and, in order to avoid what was imagined to have been the cause of the fever which had been so fatal to the former party, they were ordered to make three days march of the twenty-two miles, but they all shared the same fate.

These repeated misfortunes made the commanding officer search for other causes, when it was discovered that there was a marshy swampy ground lay between the plantation where the soldiers were quartered, and the sea, and that the moist putrid exhalations from thence, carried by the sea-breezes to the quarters of the men, had been the cause of all the sickness and mortality which had been amongst them. The discovery of this circumstance prevented any more of the military being sent to this place."

So much, Gentlemen, for the site of hospitals. When a medical officer is consulted as to their plan and construction, the leading points he should bear in mind, are, to have the hospital so situated with regard to the barrack as to prevent the ready access of idle visitors, or indeed any communication with the exterior which is not authorised by the medical officer. The wards should be lofty in the roof, capable of thorough ventilation, and not too large, perhaps those containing from twelve to sixteen patients are the most advantageous; in calculating the accommodation of an hospital, the estimate should be at least six feet by six for each bed, or thirty-six feet square, whatever may be the height of the ward, and the room should in some measure be apportioned to

patients agreeable to an estimate of its cubic contents; thus, a room sixteen feet long, ten broad, and ten high, will contain 1600 cubic feet of air, and is well calculated to accommodate two patients, allowing 800 cubic feet for each; and it should be a general rule, that when there are any fractional parts above the specific allowance, such fractional parts should be allowed as an equivalent for the portion of air displaced by the bedsteads, tables, forms, &c. Tenon, in his very interesting work on the Parisian Hospitals, states, as the proper allowance for each convalescent patient, six and a half cubic toises of air, and seven cubic toises for each sick patient; (each toise being equal to 76,734 English inches,) which, says he, is the proportion in those hospitals, where I have found the mortality moderate, "où j'ai trouvé la mortalité modérée."

The wards ought as much as possible to approach to a rectangular form, so that the whole of the patients may be exposed at once to an officer's eye the moment he enters the ward. All angular projections, recesses, cupboards, &c. ought to be excluded; every additional crevice or corner being generally converted into an additional receptacle for filth, and every contrivance of the kind to which I allude, is calculated to obstruct the cleaning and ventilation of the wards. Where

the hospital consists of two or more floors, the surgery, store-rooms, kitchen, and in short all the offices necessarily appertaining to an hospital should be situated in the ground floor, in order that additional space may be left for the accommodation of patients above. The subject of ventilation, I do not consider it necessary to resume at any length, having, when on the subject of ventilating barracks, expressed myself fully on this point, and ventured to suggest a plan, which, with due modification, is equally applicable to hospitals. The leading principle upon which all our plans for ventilation should be founded, is the simple fact, that air heated by respiration naturally rises to the tops of the wards, while the cooler and heavier air occupies the lower parts; hence, judicious openings at the top and bottom of a ward will always ensure the exit of the upper stratum of air, and, consequently, produce an influx from below to occupy its place.

In the excellent practical work of the late Dr. Hennen, you will find a section on the ventilation of hospitals to which I can refer you with confidence for much valuable information on this point, and, at present, I would only remark, that, while ill ventilated hospitals have, on the one hand, been represented as the ruin of an

army, they have, on the other hand, when duly regulated in this respect, been looked upon as one of its greatest blessings. Sir John Pringle speaks of hospitals, although intended for its preservation, as one of the chief causes of sickness and death in an army, "on account of the bad air and other inconveniences attending them." While Professor Brugmans of Leyden, who was eighteen years at the head of the Medical Department of the army in Holland, states, as a proof of the efficacy of ventilation in obviating the ravages of one of the most formidable complaints incident to the wounded, that, in 1799, they received into the military hospital at Leyden, the situation of which was not good, four thousand wounded men, but did not perceive amongst them the smallest trait of hospital gangrene, which he attributes to the vigilant attention of Stark the surgeon-major, in procuring "a constant renewal of the air."

In order to render military hospitals more fully adequate to the purposes for which they are intended, it would, I conceive, be an important addition if they were all furnished with a receiving room, or other commodious apartment supplied with tubs, and with ample command of water, both cold and warm, in order to give us the means

of making every patient thoroughly clean upon his admission ; hospitals should also be provided with a foul linen store and steeping tubs adjoining the wash-house. The dead-houses, store-rooms, necessaries, &c. should not only be better ventilated, but also much better lighted than they frequently are ; the surgeries too are often deficient in point of shelving, &c. for the commodious arrangement and preservation of the medicines.

Many of the preceding remarks are only applicable to houses expressly built, or hereafter to be built for hospitals ; in appropriating other buildings to this purpose, many of the accommodations I have alluded to must necessarily be dispensed with ; but houses eligibly situated, substantially built, capable of being thoroughly cleaned and ventilated, are what we ought to select for the reception of our sick, wherever they are to be found.

In proceeding to consider the interior economy of hospitals, which embraces the financial, purveying, and culinary arrangements, I shall chiefly advert to these matters as they are conducted in regimental hospitals ; these being considered by all experienced surgeons as the most desirable receptacles for the sick soldier, and being the esta-

blishments in which a large majority of the British troops fall to be treated when sick. In entering upon this subject, it is necessary you should understand that regimental medical officers are, in every respect, except in points purely professional, under the orders of the commanding officer of the regiment, on whom it is incumbent to take care that every attention is paid to the health of the men entrusted to his command; that the sick are properly attended, kindly treated, and that they have every allowance to which they are entitled; but surgeons are always to perform their professional duties under the instructions and control of the Director-General of the Army Medical Department. The general expenditure of the hospital is under the immediate direction of the surgeon, who is responsible for the due appropriation of the fund allotted for its support, as well as for the general conduct of the hospital, and of the servants attached thereto.

Under existing regulations, the sum of tenpence a-day is stopped from the soldier's pay towards his maintenance when sick in hospital; and abundant experience has proved that the aggregate sum arising from these stoppages is, under ordinary circumstances, and under judicious management, fully adequate to the necessary ex-

penses of the hospital. In the "Fifth Report of the Commissioners of Military Inquiry, printed by order of the House of Commons in 1808," you will find much interesting information, as to the financial concerns of army hospitals, and you will there find an opinion as to the adequacy of the established rate of hospital stoppages to meet the necessary expenses, expressed in the following strong terms, by a very experienced medical officer, Dr. Borland: "The new system has been introduced in the West Indies by Inspector Kerr; in Sicily, by Deputy-Inspector Somerville; at the Cape of Good Hope, by Deputy-Inspector Baillie, &c., where the savings have been greater than at home; and there can be no doubt that if *one* authority controlled, and *one* medical regulation pervaded the whole army, the hospital expenditure, medicines included, might be defrayed from the hospital stoppages."

The rate of diet being in every case appropriated to the nature of the disease under which the soldier labours, it no doubt often happens that what he actually receives, in the shape of aliment, is not equivalent to the amount of his stoppages, but of this he can have no reason to complain, considering that, if reduced either by the nature or duration of his disease, to a state

requiring additional nutriment and wine, he is equally furnished with them, however much their value may exceed the sum stopped from his pay. In a former lecture I adverted to the diminished rate of hospital stoppages on the Indian station; where, at the time I served in that country, they were, and I believe still are, only about one-half of what is exacted on other stations. Why his Majesty's orders, on this head, have not been enforced in India, as well as in every other quarter of the world, I am unable to say; but this I know, that if the diminished rate of stoppage has been established as an act of benevolence to the sick soldier, the object has been completely defeated; a soldier being able to accumulate money in hospital, is an evil fraught with the most serious ill consequences to himself and to the service, by holding out an inducement to him to remain in hospital, and by frequently leading him into excesses on leaving it.

Upon home service it is the duty of the surgeon to provide the meat, bread, and every other article of diet, required for the sick, at the market price, and of the best possible quality; the price being ascertained and verified by the commanding-officer of the regiment, whose approving signature is necessary to authenticate the

surgeon's accounts. On foreign service the bread, meat, and more bulky articles of provision for the sick are frequently supplied by the commissary, so far as his resources enable him, and it is the especial duty of the surgeon to see that these articles are of the best quality to be procured, or to make an immediate report to his commanding-officer on the subject should he find them otherwise. I need not indeed inculcate the necessity of keeping a vigilant eye on the inferior officers of the commissariat, for I have never seen any disposition to spare them in the service; without, however, entertaining or encouraging any thing like an illiberal feeling towards these gentlemen, I most heartily and fully concur in the following sentiments of Dr. Millingen, applicable particularly to the inferior officers and servants employed in the purveying department of large general hospitals; "whenever, (says he) a medical officer suspects that irregularities exist, he should diligently and silently watch every motion until fully able to bring the offence to light, and the offender to punishment. Medical officers must recollect that their professional character is deeply involved in the prosperity or failure of their efforts, which will be rendered nugatory if the interests of the sick are allowed to be sacrifi-

ced by the peculation of their servants. Fraudulent conduct, on the part of the administrators of hospital economy, is not a case of ordinary delinquency, for any act which, directly or indirectly, tends to weaken or cripple our armies, constitutes a national crime; and it is to be regretted that our military code does not provide for the exemplary punishment of such offences."

The impropriety of having the purveying department of hospitals in the hands of the medical superintendant was pointed out by Dr. Donald Monro in the strongest possible terms many years ago. "The directing and purveying branches ought never to be entrusted to the same person, as the temptation of accumulating wealth has at all times, and in all services, given rise to the grossest abuses, which have been a great detriment to the service, as well as to the poor wounded and sick soldiers, and has occasioned the loss of many lives. And therefore neither the physician-general, nor any of the physicians or surgeons of the army, or any other person concerned in the direction of the military hospitals, ought ever to act as purveyor or commissary; nor ought they ever to have any thing to do with the accounts, contracts, or any other money affairs relating to the hospital; and if ever they be found to intermed-

dle in these affairs, they ought to be immediately dismissed the service.

"I cannot help here taking notice, that this very absurd practice of appointing some physical person to be both director and purveyor, or contractor without control, has crept into our service: and been, on more occasions than one, of the greatest detriment to the poor distressed soldiers. For as the commander in chief of an army, in time of service, has always a great deal to do in the way of his own profession, and is often not well acquainted with the routine of hospital duty, trusts every thing relative to hospitals to the director; who, if not thoroughly honest, and proof against temptation, is apt to follow such plans (however detrimental to the service) as give him the greatest opportunity of imposing on government and accumulating wealth; by acting in this capacity of contractor without control, as well as of director.—And as the director is commonly much at head-quarters, and has the ear of the commander in chief, if any physician or surgeon attending the hospitals, complains of the abuses that are committed, he is represented at head-quarters by the director as a troublesome discontented man; and instead of his complaints being attended to, he is, perhaps, checked for finding

fault, and sent to some distant hospital, or on some disagreeable duty, to be out of the way of making farther observations on the director's conduct."

These and the subsequent observations of Dr. Monro upon this subject, have long been familiar to me; and, in India, where, until a very recent period, the surgeons held a contract for victualling their sick, I have seen evils arising from this combination of the purveyor and the surgeon, upon which I will not enlarge; but I may be permitted to lay before you the following extracts from an unpublished memoir upon military hospitals, written nearly eighteen years ago.

"Independent of all temptations to abuse, which, it is to be hoped, most of us could resist, this plan is in some cases absolutely incompatible with the proper dieting of the sick. It may be very possible for a surgeon, while lying quietly in garrison or cantonment, to furnish provisions for his sick without much additional trouble, but whenever his regiment comes to be employed in active operations against an enemy, all his talents and exertions are then required in his proper capacity, and he has his hands abundantly full, without having the complicated concerns of a victualling department to attend to.

It by no means follows, that because a man is a good surgeon he should be a good commissary also, and it is obvious, that whatever tends to withdraw his attention from the study and practice of his professional duties, must ultimately prove injurious to the service." These observations were written shortly after the capture of Java, where the disadvantages of the practice to which they refer were abundantly conspicuous, as was evident from the orders of the commander in chief; and where a case occurred, tending, perhaps more than any other circumstance, to fix my opinion of the evils accruing from having the purveying department in the hands of the surgeon. That case I have noticed in the following words.—" The present allowances are well known to be in general adequate to all the purposes required of them, but instances are not wanting where the surgeon has been for months together considerably out of pocket by a large demand for wine ; indeed, I know a case at this moment quite in point, it is that of an assistant-surgeon, left by the death of his surgeon in charge of a sickly regiment requiring a large supply of wine. He has no prospect of retaining the charge of the regiment for any length of time, and, of course, no prospect of reimbursing him-

self at a more favourable opportunity. What is to be done? This young man must either procure wine from his private funds and involve himself in debt, or he must withhold it and let his patients suffer. The alternative is dreadful; in such a case it is extremely hard to say how far a man's philanthropy and public spirit should carry him, and where an attention to his private interests ought to make him stop short; certainly nothing so important as the supplies for the sick ought to rest on the precarious footing of an individual's liberality."

These observations may now perhaps be considered superfluous, as the practice to which I object has recently been abolished in India as well as everywhere else; but I am pleased to have this opportunity of expressing my opinion of a practice, which I have always reprobated, and the bad consequences of which I have witnessed in shapes upon which I do not choose to dwell. While no man can be more desirous of seeing his professional brethren meet with those rewards to which a faithful and honourable discharge of their duty so justly entitles them, yet I am anxious that such rewards should spring from professional exertions and professional merit alone; and I am anxious to see the members of the profession rescued from those

ignorant, illiberal, and offensive insinuations to which they will ever be subjected, when acting under a system where a man's duty and his interest appear to be at variance, and where there is even the most distant ground for believing, that the surgeon, by stinting his patient, can enrich himself.

In the book of instructions to regimental surgeons you will find a diet table adapted to the products of this country, to the different descriptions and stages of disease, and to the periods of convalescence. This scheme must be rigidly adhered to wherever circumstances admit, and when, upon foreign service, it becomes necessary to deviate from it, a new scheme adapted to the nature and products of the country, should be established by authority of a board consisting of the senior and most experienced officers of the medical staff. When tables of diet are thus judiciously adapted to situation and circumstances, few occasions will occur where it becomes necessary or proper to make any deviation, or to burden the diet roll with expensive extra-allowances in the shape of food or wine. Delicate and luxurious articles of extra-diet were probably introduced into army hospitals by practitioners from civil life, who lost sight of the simple nature of the heal-

thy soldier's food. Such extra-allowances tend to create discontent amongst the men, who never can see the necessity of distinctions, or appreciate the motives which actuate you in directing them for one more than another. They are really very seldom necessary amongst a class of men accustomed to the plainest food, all situated so much alike, and in many cases labouring under the same class of diseases. The most essential part of a sick man's diet, when any thing in the shape of animal food is admissible, is his broth, and this ought to be prepared with the utmost care and attention; when few men are born on the tables on half diet, we cannot expect to have it of sufficient strength, unless it be expressly prepared for such patients as cannot consume solid animal food, by adding to the soup kettle bones, bullocks heads, shins, or such other parts as will improve the soup at an economical rate.

In seaport towns where fish are abundant, they may with great propriety be employed as part of the scheme of hospital diet, giving them alternately with meat; and when fruit and vegetables are abundant, they may in some cases be given liberally; pies, however, either of meat or fruit, are for the most part highly improper, and ought never to appear in our hospital diet rolls; when extra meat is

required, it should be plainly dressed in the form of steaks or chops, and fruit should be always well stewed and seasoned. The articles for hospital diet may also be somewhat varied according to the seasons of the year. In the summer months less animal food is requisite ; and the proportion of fresh vegetables may be increased, while rice and barley must be substituted for part of these during the winter. Simplicity in preparing food is by no means inconsistent with a certain degree of variety, but a mistaken view of this subject should never lead us to burden our diet rolls with refined luxuries, only known and only wished for in private life. While none of us would wish to be reduced to the extremities of suffering pictured in Barron Larrey's account of the distresses of the wounded French after the battle of Eslingen, it is right you should know what has been done, and what may again be done, even in the worst of times; the hospitals on the isle of Lobau underwent great privations in consequence of the difficult communication with the main land by means of a few boats, and the uncertain supply of provisions and the necessaries of life. Larrey was obliged to prepare broth for his patients made by boiling horse flesh, and seasoning it with gunpowder for want of salt.

"Malgré la prompitude et l'efficacité de tous les moyens que nous avions employés, les blessés étaient dans une situation pénible, tous étendus sur la terre, rassemblés par groupes sur les rivages du fleuve, ou dispersés dans l'intérieur de l'île, dont le sol était alors sec et aride. Les chaleurs du jour étaient très-fortes, et les nuits humides et glaciales. Les vents, qui sont fréquens dans ces contrées, couvraient à tout instant ces blessés de nuages de poussière : quelques branches d'arbres, ou des feuilles de roseau, ne les garantissaient qu'imparfaitement des rayons du soleil.

"La rupture des ponts et la pénurie des barques pour le transport des denrées ajoutèrent à ces vicissitudes, et nous mirent dans une privation extrême de bons alimens et de boissons confortantes, dont nos malades avaient un pressant besoin. Je fus forcé de leur faire préparer du bouillon avec de la viande de cheval, qu'on assaisonna, au défaut de sel, avec de la poudre à canon. Le bouillon n'en fut pas moins bon ; et ceux qui avaient pu conserver du biscuit firent d'excellente soupe qu'on ne se figure point que ce bouillon avait conservé la couleur noire de la poudre : la cuisson l'avait clarifié."

The nature and quantities of the articles con-

stituting the different rates of diet established in our military hospitals are minutely specified in the diet tables already referred to. The forms of these, as well as of the Medical Registers and other records kept by the army surgeons, I shall have an opportunity of showing you in the Castle Hospital, which, by the kindness of the Director-General and of the medical staff officers on the spot, I am occasionally permitted to visit with the pupils of this class. You will find that these records are calculated to afford a valuable fund of professional information; and it would be well if this was more frequently made public. I may here be permitted to advert to one advantage which these documents possess over some of those with which the profession is inundated. I allude to the necessity which the military surgeon lies under, of stating without reserve the results of all the cases coming under his care, whether successful or otherwise. In private practice, and even in civil hospitals, it too often happens that the results, unless highly favourable to the practitioner, are not made known; in military hospitals again, the more unfavourable the results, the more is the medical officer compelled to be explicit. In the former instance, the minute detail of an

unsuccessful case is a matter of option, in the latter it is a matter of necessity. Indeed, I cannot but look upon the habits of plain statement, of unreserved communication, of concise and at the same time comprehensive detail, so naturally acquired in large military hospitals, as amongst the most valuable lessons which you, as professional men, can learn.

It now remains for me to give a very summary exposition of the comparative advantages of general and regimental hospitals, for the information of those who have not had an opportunity of witnessing the contrast. General hospitals have sometimes been characterised as general but necessary evils; to them, the observation already quoted from Sir John Pringle respecting the vitiated air of hospitals, as well as the following remarks of Dr. Jackson, are more particularly applicable; "Height of roof is a property of great importance in a house appropriated to the reception of the sick of armies; for the air being contaminated by the breathings of a crowd of people in confined space, disease is originated, and mortality is multiplied to an extraordinary extent. It was often proved in the history of the late war, that more human life was destroyed by accumulating sick

men in low and ill-ventilated apartments, than by leaving them exposed, in severe and inclement weather, at the side of a hedge or common dyke. It is fit that the military officer mark this fact, and bear it in mind."

It is indeed conformable to all medical experience, that when large bodies of sick are brought together, disease is frequently aggravated, and contagion sometimes generated ; but, independent of the evils arising from this concentration of disease, the slovenly, irregular, and unsoldier-like habits, so readily contracted by soldiers, while patients in general hospitals, has often been a source of regret to commanding officers, and of serious injury to the service ; while the abuses and peculations existing in these hospitals, have been at all times an endless source of complaint. General hospitals are however absolutely indispensable upon service, and much may be done to obviate the evils attending them, by a due classification of patients. Independent of the usual arrangement of patients according to the diseases under which they labour, wherever space will admit of it, it would be highly useful to subdivide the sick according to the divisions, brigades, or regiments to which they belong ; so that medical officers of divisions and brigades, when serving in these gene-

ral hospitals, may have their respective charges concentrated as much as possible; while by the mere juxta-position of men belonging to the same regiment, the steady soldier or non-commissioned officer who feels for the character of his corps may have a vigilant and controlling eye over those who may be disposed to irregularities, idleness, or malingering. General hospitals, when well regulated, afford perhaps advantages and superior comfort to the sick soldier worn down by protracted disease, as in them he has the advice and attendance of the ablest and most experienced medical officers; as schools of instruction too they are capable of being made exceedingly useful to young men joining the army—advantages to be set off against the evils and abuses with which these establishments have been charged.

Let it not, however, be supposed for one moment that I mean to dissent from the opinion entertained, I believe, by every experienced medical officer, of the superiority of regimental hospitals, which afford the means of effectually treating the sick of armies, without that accumulation of disease, irregularity of conduct, and complication of accounts, which have sometimes proved so detrimental to the service.

The following passage from Sir James M'Grigor's paper in the Medico-Chirurgical Transactions, will enable you to judge of the advantages derived from them in the late war.

"The divisions of the army, composed of from eight to fifteen or sixteen regiments, under the command of a lieutenant-general, were each of them under the medical superintendence of an inspectorial officer, to whom the surgeons reported, and who regulated all the medical concerns of the division. It was his duty, to see that, however short a time a battalion or a corps rested in one place, a regimental hospital was established; indeed as they carried with them medicines, bedding, stores, and all the materials of an hospital, a regiment might be said to have its hospital constantly established even on the march. It was frequently established in the face of an enemy, and nearly within the reach of his guns. When a regiment halted, after getting the men under cover in some building, and constructing chimnies, the first object was to make bedsteads, getting at the same time additional mattresses of straw, rushes, &c. It was really surprising to see with what rapidity this was done; so much were regiments in the habit of

it, that latterly, I found the hospitals complete in every thing, and the men most comfortably lodged in a few days after a regiment had halted. In short, by making every corps constantly keep up an establishment for itself, we could prevent the general hospitals being crowded; much severe and acute disease was treated in its early and only curable stage, and no slight wounds or ailments were ever sent off from the regiments; by which means the effective force of the army was kept up, or perhaps increased by several thousand men, and this was effected by the joint exertions of the medical officers who served in the Peninsula; the result of medical science, and their experience of soldiers, their habits, and their aptitude to particular diseases:"

"Regimental hospitals," says Dr. Millingen, "hold out advantages which will in vain be sought for in general ones. Conducted under the eye of the commanding officers of corps, they form part of the regimental economy. The surgeon can acquaint himself with every individual's character, habits, and description, circumstances which most materially tend to assist him in the execution of his duties:—The men, indeed, assembled in these establishments are bound

by ties of regimental discipline and economy, which constitute the superiority of battalion hospitals—here misconduct is more thoroughly repressed, and malingering more easily detected; an *esprit de corps* is kept up which promiscuous intercourse tends always to destroy.

If our medical arrangements in the field have not yet attained that degree of perfection, and rapidity of action, which distinguish the hospital ambulance of the continental powers, more especially of France; yet we have excelled all other armies in the establishment and administration of regimental hospitals; and it is but justice here to observe, that to Mr. Knight, the late Inspector-General, the nation is chiefly indebted for the efficiency and organization of these most important establishments."

Such, Gentlemen, are a few of the leading points most worthy of your attention in the administration of military hospitals; and in order to complete the very limited view of this subject, which I am at present enabled to lay before you, I would beg your attention to a proposal for the establishment of hospitals for officers upon foreign service. This is a measure which, although it has sometimes been partially acted upon, particularly in the navy, has never yet been esta-

blished in the British service on that general and extended scale calculated to ensure its advantages—would there were room for the opinion that such a desideratum had never been experienced, or that the want of such an establishment had not been more fatal to the officers of the army than inconvenient to their medical attendants.

Twenty years have now elapsed since the necessity of such an institution was ably advocated by Sir Arthur Brooke Faulkner, in a pamphlet written after the disastrous expedition to Walcheren. The pictures there given of the miseries incident to sick officers in billets are such, as I apprehend, the public is but little acquainted with.—A field officer so wretchedly accommodated as to render it necessary to remove him from his billet, almost *in articulo mortis*—another officer, labouring under *fever*, lodged in a mill, the noise of which was so loud and incessant, as to prevent his physician from hearing his patient's replies to the questions put to him—a third, compelled to remain in the market place, while his companion sought accommodation for him, and was ultimately glad to obtain it in an apartment over the tap-room of a common gin shop—a fourth, lying for four days upon the floor of a small

dirty apartment, with the accumulated filth of that time unremoved.—These, and a thousand minor evils, of which the experience of every army surgeon will furnish examples, are, I apprehend, enough, and more than enough, to rouse us to a sense of the distress to which sick officers are occasionally subjected in their billets, particularly when deprived by sickness, incapacity, or misconduct, of the assistance of their servants.

When gentlemen are thus in want of the usual comforts, and decencies of life, it were idle to dwell upon the futility of exhibiting medicine under such disadvantageous circumstances, or the impossibility of giving due medical attendance to sick officers distributed in billets over a large town. In such a situation it is impossible for the most zealous medical officer to apply his talents, either with justice to his patient, or any kind of satisfaction to himself. " In the case of an officer affected with delirium, when it was dangerous to leave him alone even for a few minutes, I have been obliged," says Sir A. Faulkner, " more than once to remain a full hour by his bedside, while his servant was getting my prescription prepared. Thus was the time of the physician, which unfortunately could be but ill

spared, consumed in performing the duty of a nurse."

The objections to the institution of an hospital for officers resolve themselves chiefly into the expense of such an establishment, and the opinion that such a species of accommodation would not accord with the feelings and habits of British officers. These objections are, I apprehend, altogether futile and imaginary. Were an officer offered the alternative of subjecting himself to an hospital stoppage proportioned to the rate of his pay, and the extent of his accommodation, or of providing for the expenses of his own treatment in quarters, it will not be difficult to decide which he ought to prefer on the score of economy; and there are, I think, few rational beings who would be disposed to prefer the gratification of false pride, and overstrained delicacy, to the restoration of health and the security of life. It would be a bad compliment to the good sense of British officers to suppose that they would, fastidiously reject a measure which has been advantageously adopted in the armies of our late rivals; and we are indebted to Sir A. Faulkner for obtaining an account of the accommodation provided for officers in the military hospitals of France. Annexed to Sir Arthur's pamphlet, is a

letter from Boudriot, surgeon-major of the French army employed at Middleburg in 1809, in reply to one addressed to him requesting information on this subject. This correspondence I thought of giving you at length, as the work is not every day to be met with ; but as I find that Boudriot's letter is reprinted in the 6th volume of the Edinburgh Medical and Surgical Journal, I shall merely subjoin a translation of the three first paragraphs, the rest of it being occupied by details into which I consider it at present unnecessary to enter.

" 1. There is in each garrisoned town in France, and in a place singled out as the most healthy, a building known by the name of Military Hospital, of a handsome and good construction, the wards of which are lofty, well white-washed, and furnished with parallel windows, which are easily opened and shut at the pleasure of the officers of health.

" 2. In the same hospital there are always one or two pavilions, destined exclusively to receive the officers of all ranks, although nevertheless they are at liberty to cause themselves to be attended (treated) in the house which they inhabit, and always at their own expense.

" 3. The officers' ward must be furnished with

beds, constructed in the most careful manner possible, and distant three French feet from each other, according to the regulation; separated by curtains, for decency, and in order to be enabled more easily, according to circumstances, to establish a current of air."

LECTURE V.

In the few remarks which I am now about to offer you on the subject of Hospital Transport, I do not propose to enter into any consideration of the arrangements for the conveyance, disposal, or removal of medical stores; but to confine myself to the immediate duties of picking up the wounded in the field; of conveying them to the nearest hospital, or station of medical officers; and of subsequently removing them from one hospital to another,—duties for the performance of which it must be admitted that a very inadequate provision has hitherto been made in the British service.

The principal assistance heretofore afforded to the surgeon in the execution of his duties, either in

the field or in quarters, consists in the appointment of a few orderlies, detached from regiments, and these, for the most part, neither adequate in number, nor efficient in point of activity and intelligence. It is not, indeed, to be expected that commanding-officers of regiments, upon whom the surgeon is dependent for this kind of assistance, should be disposed to part with that description of men best qualified for the duties we have in view. The number of men often withdrawn from the ranks, by duties of fatigue, and casualties incident to the service, is materially increased by the number necessarily employed in attendance upon the sick,—an attendance which should not be left to be provided for on the spur of the moment, but should be established and organized on a liberal scale.

For this important purpose, the only effectual provision seems to be, the formation of an hospital corps, placed entirely at the disposal of the medical staff, and consisting of men either enlisted and embodied solely with this view, or transferred to the hospital establishment in consequence of having, from years or from accidents, become less effective in the line. A body of men of this description, trained to the particular duties required of them, qualified

to attend the sick in the hospitals, as well as to succour and bear off the wounded in the field, would preserve the effective force of regiments; would afford a degree of comfort to the sick and wounded, to which they are too often strangers; and would give an efficiency to the medical staff, which the most zealous devotion to the duties of the service cannot otherwise ensure.

In adverting to the means used for the conveyance of wounded men, I shall not at present enter into any discussion of the merits of those ingenious contrivances for the security of fractured limbs, invented by various surgeons, some of whom have endeavoured to enhance the merits of their respective inventions by representing them as peculiarly adapted to the comfort of the wounded. At a future period of the course, when we come to consider the subject of fractures, in a Surgical point of view, I shall take an opportunity of showing you many ingenious pieces of mechanism, not, indeed, under the idea that, as military surgeons, you can ever expect to be provided with such contrivances, but, that, by studying the principles on which they are formed, and seeing the objects aimed at in their construction, you may learn to devise substitutes from the simple materials within your reach.

At present I would observe, that the carriages employed for the sick naturally resolve themselves into two kinds; those carried by men, what may be termed hand-bearers, or litters; and into wheel carriages, or those drawn by horses or bullocks. Of the former, the looped blanket is one of the most simple and common expedients; this is formed by attaching loops to the two opposite edges of a common soldier's blanket; the blanket is then doubled upon itself, one sergeant's pike passed through the doubling, and another through the loop-holes in the outer edges of the blanket. A similar bearer has also sometimes been formed by bottoms of canvas ticking, with poles made on purpose to support them. Both these forms of bearers, however, being without traverses or stretchers, are found exceedingly defective; the weight of a patient sinks down the yielding blanket or canvas so as nearly to reach the ground, and when this is very unequal on the surface, or covered with large stones, the wounded are liable to be further injured, by coming in contact with them; the poles are also pressed in upon the haunches of the bearers, so as to hamper them in their movements, and to render it impossible for them to proceed either with ease or celerity.

These objections are completely obviated by the ingenious contrivance recommended by Dr. Millingen, of which I now show you a model. (Here a model of Dr. Millingen's bearer is shown, as figured in the frontispiece of his work.) This consists of two parallel poles, separated by two traverses or stretchers, with short legs, and supporting a canvas bottom. The poles of these bearers, when not employed for this purpose, and armed with pikeheads, removeable at pleasure, form weapons of offence and defence to the men of the hospital corps when escorting wounded, or guarding hospital stores or provisions. Each individual of this corps being armed with one of these pikes, furnished with one of the traverses strapped upon his knapsack, and one of the canvas bottoms girt round his waist, any two of them meeting together, will be enabled, in a few minutes, to equip a light and efficient bearer, capable of carrying off a wounded man with all the comfort of which his situation admits; his pack being placed under his head as a pillow, and his firelock slung from the side of the bearer by means of loops attached to it for this purpose. Dr. Millingen also proposes, that each transporter should be furnished with sling belts, such as you see every day upon our

chairmen in the streets, by which the bearer will be slung from the shoulders, and thus more easily carried. For the more minute details of this equipment I must refer you to Dr. Millingen's work; and at present I shall only observe, that it appears to me, (and, I may add, to every army surgeon to whom I have had the pleasure of showing this model,) one of the most simple, efficient, and practicable contrivances for the conveyance of the wounded which has yet been devised.

A bearer somewhat akin to this was proposed by the late Colonel Crighton of this place, which you will see figured in the first volume of the Edinburgh Medical and Surgical Journal, and one of which is deposited in the Royal Infirmary, where it may be seen by the pupils of the house. This consists of a piece of frame work, borne, like the former, upon two poles, supporting a tilted cover, and having a small cot or hung bed suspended from it, in which the patient is placed. I have upon two or three occasions employed this litter in conveying patients to or from the Infirmary, and have reason to consider it a very comfortable conveyance. It is, however, obviously the production of a man who had the Edinburgh chairmen in his eye as bearers, and from its cum-

brous and unwieldy form is quite unfit for the service of the field.

The only other conveyance of this kind which I shall notice, is that very generally used in the Indian army, the Dooly. This varies somewhat in its form in different parts of the country; in some cases it consists simply of a cot, or rather hammock, suspended from a bamboo, and screened by an awning from the sun. In other cases it consists of a more finished piece of frame-work, covered by painted canvas, so as to protect the patient from the weather, and calculated to let him lie at length within it. (Here a model of the Dooly used in the Madras army is shown.) This, you see, is suspended by a pole or bamboo passing through it, and is borne on the shoulders of four men. Nothing can well be conceived more perfectly adapted to the conveyance of sick than these doolies or palanquins, but the number of bearers required for them, (some hundreds to each European regiment,) renders it impossible to bring them into use in any other country than India.

Before describing the wheel carriages used for the conveyance of sick and wounded, I would request your attention for a moment to an intermediate description of carriage, neither borne by

men nor drawn by horses, I allude to the mode of conveyance used in some cases by the French army in Egypt, upon the backs of camels. In the first volume of Baron Larrey's memoirs, you will see a plate representing the necessary equipment for this mode of transport. It consists of two large boxes, or camel trunks, fitted up as litters for the reception of the wounded, and slung one on each side of the animal over a pack-saddle. The camel is made to kneel, as in other cases, to receive his load, and thus the sick may easily be placed in such a conveyance. In a country where this is the only beast of burden, we may again be under the necessity of having recourse to this mode of carriage; but I should think, from my personal knowledge of the peculiar gait of the camel, that his pace is not much adapted to the comfort of a wounded man.

In Larrey's Memoirs you will also see a figure of what is termed the ambulance of Baron Percy. This is a four-wheeled carriage of a very simple construction. It consists chiefly of a sort of ridge pole raised upon the frame-work of the carriage, and upon which the wounded are placed astride as if on horseback, and here they sit protected by a sort of canopy. This can only accommodate men slightly wounded about the

head, superior extremities, or upper part of the trunk, and is evidently unsuited to men who may have received severe wounds or fractures of the lower limbs.

In the account of the Italian campaign, in the first volume of his Memoirs, Larrey describes two voitures or spring carriages of his own invention; the one with two and the other with four wheels. The smaller one is thus described by the Baron. "The chest or body presented the shape of an elongated cube, arched on the top; it was pierced by two small windows in the sides, two folding-doors opening before and behind; the floor of the carriage was formed of a moveable frame, furnished with a hair-matrass and pillow, covered with leather. This frame glided easily upon the two supports or cheeks of the body, by means of four small castors, and it was provided with four iron handles, fastened into the wood. These handles were destined to receive the belts of the soldiers, in order to carry the wounded upon the frame as upon a barrow. The wounded could be dressed upon these frames, when the season did not permit them to be dressed upon the ground. The little vehicles were drawn by two horses, one of which carried the driver; internally they were 11 decimeters, 12 millimeters,

(or 32 inches) wide. Two wounded could lie all their length in them easily; bags were distributed in the inside of them to receive bottles or other objects necessary for the sick. These carriages combined solidity with lightness and elegance." (A model of this carriage is here shown to the class.) The larger one was constructed upon the same principles, was calculated to convey four patients lying extended, and was drawn by four horses.

The only conveyance hitherto in general use for the sick of the British army, is the common spring-waggons. They are supported on four wheels, and drawn by four horses; calculated to convey six or eight men with slight injuries, and to hold two lying extended horizontally. Their general outline bears considerable resemblance to the carriage just described from Larrey's work, but they are much less commodiously fitted up in the interior. Some of them are floored with deals like a common cart, and others have a depression or well in the bottom, calculated to receive the mens' feet, and to enable them to sit upright with more comfort. A conveyance of this description is used here for bringing up poor patients from Leith to the hospital, and may be frequently seen at the door

of the Royal Infirmary. Some of those used for the service of the troops are deposited in the Fort at Leith; and my friend, Dr. M'Intosh, acting-surgeon to the Ordnance in North Britain, desires me to say, that he will have much pleasure in directing them to be shown to any of the pupils of this class, who may be desirous of making themselves more minutely acquainted with their construction. These vehicles are, however, but indifferently calculated for the conveyance of the wounded; and from the expense of their construction, and the establishment of men and horses necessary to render them efficient, prove a very cumbrous and unwieldy appendage to an army, as I shall immediately have occasion to show you.

This has led to the suggestion of other descriptions of carriages intended to supersede in whole or in part the use of the common spring-waggon. With this view, a regimental long car has been proposed by Dr. Millingen, of which you will see a small figure in the frontispiece to his work. These cars are calculated to be drawn by two horses, and to move to the rear, with facility, ten or twelve men each, wounded in the head, face, upper extremities, and lower extremities, without fracture,

together with their arms, packs, and accoutrements.

"The cars here proposed are similar in construction to those vehicles commonly called in Ireland, jaunting cars; they should be mounted upon four wheels, narrow, and sufficiently long to accommodate six men on each side, seated back to back, their feet bearing upon a splash board, outside of the wheels, their packs, &c. placed in the centre of the car; these carriages might also be constructed of the length of the continental long ammunition tumbrils, and with three or four horses could bear off 24 wounded at a time.

"The body of these cars would also carry each regiment's field hospital bedding, consisting of 12 palliasse and bolster cases, 24 pair of sheets, and only weighing 96lb.; the comfort and advantage arising from the possession of these stores, cannot be sufficiently appreciated. When troops are moving at a distance from the theatre of war, these cars might also carry 12 rugs, weighing about 88lb. and upon a march would convey sickly men, and the packs of those who are unable to bear them with their companies.

"It is true that in the cars here proposed, the wounded are not under cover; but long and personal experience has convinced me, that the co-

verings of our spring waggons are more obnoxious than grateful, except in rainy weather; and the rapidity with which a great number of wounded may be borne to the rear, will fully compensate for this inconvenience, should it ever be considered as such. These long cars have moreover the additional advantage of being narrow, and therefore less likely to block up roads, than waggons, wains, bullock cars, &c. the usual heavy and cumbersome means of transporting sick and wounded."

Such carriages as these would no doubt prove a most valuable addition to the means of transport hitherto afforded to regiments, but by far the most ingenious contrivance for the conveyance of sick and wounded which I have ever seen, is that of Mr. Cherry of Clapham, formerly a veterinary surgeon in the army. This consists of a light single-horse cart, so constructed as to be readily adapted either to the conveyance of wounded men, or to the carriage of stores and provisions; for these two different purposes, a great part of the frame work of the cart is moveable, and capable of being adjusted to the object required; but the most ingenious part of the contrivance is that by which the ordinary springs of a cart or other carriage may be

protected from injury when carrying heavy loads, while, at the same time, it admits of their free use when light loads are carried. This is effected by two moveable blocks sliding along the axletree; and which, by means of a lever connected with them, may either be moved outwards under the frame work of the cart, so as to make its weight bear directly on the axle without injuring the springs; or, by turning the lever in an opposite direction, the blocks may be withdrawn from under the side pieces of the cart into the hollow space formed by their thickness, and the springs thus again brought into action.

I regret that I am not yet in possession of a model of this carriage, so as to make the whole of Mr. Cherry's contrivance as readily intelligible to you as I could wish; but the part of it which I have just been describing is represented in the plate which I now show you; from the 38th volume of the "Transactions of the Society for the Encouragement of Arts;" the silver medal of which society was awarded to Mr. Cherry for this part of his invention. I could also have wished to be able to refer you to a pamphlet of this gentleman's, containing "Observations on the Defective State of Army Transport, with Suggestions for its Improvement," which he has been good

enough to send to me. As that paper, however, has not been printed for publication, I must trust to Mr. Cherry's liberality to forgive me for the liberty I now take in laying before you the following extracts from his pamphlet, which will show you that he has considered the subject of military transport in all its bearings, and that his observations are the result of sound judgment and matured experience. In thus endeavouring to extend their utility, I have no object in view but the credit of their author, and the interests of the public service.

"The transport required by every army, independent of the ordnance service, which has its own peculiar establishments, may be classed under two heads; namely, that which is requisite to carry provisions, forage, and the ordinary supplies; and that which is requisite to carry sick and wounded men:—or, in other words, into *Commissariat* and *Hospital* transport.

"But although the transport required by an army admits of being classed under these two heads, yet they again, in a great measure, resolve themselves into one, and require but one species of transport to supply both, more especially during an active campaign, when transport is most

valuable; because the wants of each exist, principally, in opposite directions; stores and supplies of all kinds requiring to be carried to the front, and sick men to the rear.

"With one species of transport allotted solely to hospitals, (or rather to the carrying of men only, for the spring waggons do not carry even hospital stores,) and another to the commissariat, the wants of one department must often remain unsupplied, while the transport belonging to the other remains idle. But by generalizing the means, by adopting a simple carriage applicable to every purpose, by placing the whole under regulations that will insure the services of every part being available for the duty most imperious in its wants, the necessity for the precarious assistance of hired transport will be greatly diminished, large sums of money will be saved, and the important duties of carrying sick men, stores, and supplies of every kind, effected with a degree of precision and promptitude hitherto unknown."

"Our situation as an island has occasioned, and may again occasion, a great part of our military warfare to consist in expeditions against an enemy's coast, or his colonies; and it surely

would be desirable for means of transport to land with each regiment, and become immediately available.

"The first step, therefore, towards substantial improvement in our army transport, should be to adopt a carriage, simple in its construction, and applicable to the conveyance of every thing that an army requires to have carried. "The next step should be to establish a system that will admit of the quantity of serviceable transport being speedily increased, at a moderate expense; and to apply it in such a manner as will insure the means of transport being at the points where it is wanted.

"The most simple, and at the same time the most really efficient, carriage that can be employed for military transport, is a light cart, drawn by one horse, and which, with little ingenuity, may be constructed to carry either the weighty and bulky articles that are required by an army, or sick and wounded men, with greater comfort and ease than can possibly be afforded by the spring waggon."

Mr. Cherry's objections to this last-mentioned mode of conveyance are detailed at length, and are, for the most part, I think, exceedingly well founded. He very justly observes, that "The

ease and comfort procured to the sick and wounded soldier, by the spring waggon conveyance, does not equal what it is sometimes supposed to do; and therefore cannot, on that score, be said to compensate for any additional burden or expense.

"The ease resulting from the elasticity of springs to a carriage, particularly belongs to rapid motion over made roads. In very rough situations their effect is lost; and, under the most favourable circumstances, the production of ease depends upon a proper adjustment of the strength of the springs to the weight to be carried on them. When the strength of the springs is out of proportion to the weight carried they do not act; and when the weight carried on the springs is out of proportion to their strength, the advantage is in that case lost, by their yielding so much as to become inert.

"These disadvantages belong particularly to the spring waggon. The worst cases of sickness or wounds, of course, require the most ease in being moved; but in spring waggons they receive the least. The waggon is calculated to carry seven or eight men with ordinary complaints, and with the weight of these the springs may act: but when the waggon is occupied by

one, or even two men, who, when very ill or badly wounded, are fully sufficient to occupy an entire waggon; their weight is not sufficient to act on the elasticity of the springs, and they would ride quite as easy in a carriage without any. Was the strength of the springs, again, adapted to this lesser weight, their elasticity would be overcome by the greater, so that in either one case or the other, the persons conveyed in spring waggons are placed in a similar situation to what they would be on a carriage without springs. Besides these objections to spring waggons, in point of ease where it is most requisite, there are others not less important in regard to the enormous expense they occasion, both in money and means."

After noticing the impediments which not unfrequently occur to the movements of troops, from the breaking down or sticking fast of waggons in bad roads, bridges, hollow ways, or other narrow passes, and the difficulty with which these unwieldy conveyances are removed, he observes, "The addition of one spare horse to a cart doubles the power to get over any road particularly bad; but in the case of waggons, even the adding of four horses, where it is practicable, to those

usually allotted, increases but little the power, from the unwieldiness of so numerous a team, and the difficulty of making so many horses draw together. Again, over rocks or any occasional impediment, where the strength of a few men would be lost on a waggon and its lading, the same means applied to carts would surmount the obstruction with ease.

"When one horse, in a set of four, fails in strength from sickness or any other cause, the consequences extend to the other three horses of the team, inasmuch as increased exertion is required from them to make up for the defective horse. The tendency of this is to knock up them also; and a whole team, together with the waggon, has frequently been destroyed from the failure of one horse."

These inconveniences arising from the failure of a team of horses belonging to a waggon are also sometimes experienced from the failure of the men employed to drive them, of which, amongst other instances, one rather ludicrous than serious occurred to myself in France. When about to march off one morning from the village where we had halted during the night, the hospital sergeant came up

to me in great distress to say, that the sick could not be moved; that one of the waggon-drivers had deserted during the night, leaving one of his horses without shoes, and that the other driver was, as he termed it, a *sort* of an idiot. Upon inquiry I found that the hospital cook, a Yorkshire man, amongst his other acquirements, knew something of the management of horses; he was immediately put in requisition as a waggoner, had the horse shod by the village blacksmith, and got the waggon under weigh amidst the jokes of his comrades.

It will be obvious, upon a moment's reflection, that such accidents as this, occurring either from the failure of horses, or from the desertion, sickness, or incapacity of drivers, are much more easily remedied in cases where carts are employed than when waggons are the only means of conveyance; for "when the weight of a load does not exceed what one horse is able to draw, skill in a driver ceases to be requisite, and it may be led by any man, however inexperienced. Neither man nor horse require instruction. From the moment the horse is purchased, or the man enlisted, they become serviceable, and of course efficient augmentations may be made without oc-

casioning the expense and delay that attend every extension of a waggon establishment."

"The employing of carts, however, is not a novel experiment, the advantages of which yet remains to be proved, and in truth no argument in favour of them is necessary; their utility, in fact, is fully established. When in the Peninsula, the more laborious and tedious method of carrying on the backs of mules was not resorted to; it was by carts that the magazines were supplied, from which the *men and horses employed with waggons drew their support;* it was by carts that far the greater proportion of sick and wounded soldiers were carried to hospitals in the rear; in short, it was by carts that all the efficient wheel carriage transport was performed."

After these and many more interesting observations on the subject of military transport in general, Mr. Cherry concludes by observing, that he has at length succeeded in completing a machine sufficiently near perfection to be submitted to a trial of its advantages, which he enumerates as follows.

"1. It is provided with flexible springs for light loads, which, by a simple contrivance, are protected from injury by heavy loads. This admits of more ease in cases of sickness that require an

entire carriage than can be derived from the stiff waggon springs.

"2. It is fitted to receive and suspend a bearer for patients that require a recumbent posture.

"3. It is provided with commodious seats, and with a support for the back of patients who are able to sit up.

"4. It is more spacious than the waggon, and therefore admits of patients alleviating pain by change of posture.

"5. Three of these carts may be equipped and supported for less money than one waggon costs.

"6. In moving patients singly, a waggon can, of course, take but one, while its proportion of carts will take three; and, in moving them collectively, carts will carry twelve men at a much less expense than attends a waggon carrying eight; in each case, as regards carts, with less pain to the suffering individual.

"7. These carts take to pieces, and may be made to occupy but very little room, either in a store or on board ship.

"8. As each cart requires but one horse, they may be brought into active usefulness at a very short notice; since any man is able to lead a horse without any previous instruction or expense whatever.

"9. The general simplicity of equipment admits

of their being attached to, and embarked, with single regiments.

"10. These carts are equally applicable to commissariat transport; the mode of arrangement for each service being extremely simple, every government carriage may be at any time appropriated to the conveyance of sick or wounded officers or soldiers; thus affording means of transport for this very essential duty to a much greater extent than can be derived from waggons, and at the same time saving large sums of money.

"In short, it is much easier to the sick or wounded officer or soldier, much more convenient and efficient for the military hospital service, and much less expensive, than the spring waggon; with the additional advantage of being applicable, as occasion may require, to the conveyance of stores of all kinds belonging to every other branch of the public service."

This cart, after having been inspected, was sent to the General Hospital at Chatham, and the official report thereon, by Dr. J. Forbes, the principal Medical Officer at that station is subjoined.

"The cart fitted up by Mr. Cherry has been carefully and minutely examined by myself and

the other Medical Officers of this hospital; and we are fully of opinion that it is perfectly adapted to the purposes for which it is intended, viz. the easy and comfortable conveyance of sick and wounded men, at the least possible expense of men and horses.

"The facility with which it is taken to pieces and again put together, as well as the simplicity of the whole appointments, and the ease with which they may be repaired by such workmen as are to be found in every regiment, are also strong recommendations.

"I have some doubts whether the springs are of sufficient strength to resist the shocks that must be frequently met with in bad roads, even with the weight they are intended to carry; this, however, is a matter of detail of easy alteration, should it be found requisite or proper.

"It is impossible to conclude without stating, that Mr. Cherry's cart has been carefully examined by Major-General d'Arcy, Colonel Christie, and Lieutenant-Colonel Paisley, and by the Medical Officers of the navy, marines, and dockyard, who have all expressed their approbation of its convenience, simplicity, and ingenuity."

The advantages of this military cart were fur-

ther confirmed by letter from the same authority, dated Nov. 3, 1822, as follows.

"After a trial of more than two years, I have not seen any reason to change the favourable opinion I at first formed of the cart. I consider it as a model of simple ingenuity, perfectly calculated to answer every purpose for which it is intended, and will, I am sure, be found a most valuable addition to the materiel of our armies on any future active service.

"Its lightness, the small space it occupies when taken to pieces, and the facility with which it may be put together and brought into use, are great advantages."

Enough has, I presume, been said to excite reflection and inquiry into the details of a subject, the importance of which does not appear to me to have been hitherto duly appreciated. With regard to this particular topic, the transportation of sick and wounded, much remains to be pressed upon the attention of government, whenever a future occasion shall unfortunately occur. Were our means of conveyance more perfect, regiments would be less frequently compelled to leave their sick behind, and we should find that sick and wounded may be moved not only without inconvenience, but often with positive advantage.

Gestation has even been advocated as a remedy in the treatment of Typhus fever by two experienced army surgeons, my late friend Dr. Jackson, and Dr. Jones, formerly surgeon of the Greys; and although my own experience does not enable me to speak to its effects in this particular instance, I have frequently had occasion to observe the improvement of cases in the course of a march.

The formation of an hospital corps for the purpose of conveying the wounded from the field of battle, and of subsequently attending them in the hospitals, has often been suggested, and it is to be hoped may hereafter be carried into effect, according to details, of which you will see a minute account in the "Army Medical Officer's Manual." No other plan seems so well adapted to effect the object in view, to afford prompt and efficient assistance to the wounded, and to preserve the integrity and effective force of regiments. "The feeling of humanity which prompts one soldier to give assistance to his comrade, or his officer, when wounded, has sometimes given a colourable pretext to another for turning his face from the enemy. One firelock is withdrawn from the line by the wound of the

soldier; a second, by the impulse of humanity; and a third, perhaps, by the force of example."

You will see, Gentlemen, from the details into which I have entered in this and the preceding lectures, that the duties of an army surgeon are not solely those of a medical man, and that many of the subjects of his attention are not exclusively of a professional nature. However imperfectly these subjects may have been treated, I have, I trust, said enough to show, that the examination of recruits; the clothing, victualling, and exercise of troops; their accommodation in camp, and in quarters; their management in hospital, independent of considerations purely professional; and the means of transporting them when sick or wounded, ought to be objects of unremitting care; and the numerous medical authors, both ancient and modern, to whom I have had occasion to refer, will afford the best possible proof of the importance which has at all times been attached to these matters by every enlightened military surgeon.

"De toutes les conditions humaines aucune n' a plus besoin des secours de la médecine que celle du soldat. Ce que la fougue de la jeunesse, la rigueur des saisons, les qualités vicieuses des alimens et les blessures les plus meurtriéres

peuvent produire de maux est rassemblé sur sa tête. Le choix des vêtemens, du regime, d'une habitation convenable, suffit pour lui conserver toute la vigueur et par consequent son courage que ne peut exister sans elle."

There is, perhaps, no body of men more thoughtless, when left to themselves, than soldiers; they have been so long accustomed to have all their wants supplied or anticipated by the vigilance of their officers, that when left without direction or assistance they become often helpless. It would indeed be difficult, if not impossible, to point out any material want of the British soldier, that has not been fully provided for, by the paternal care of his late Royal Highness, the Commander-in-chief. Of the obligations which it owes to that distinguished individual, the British army is, I trust, fully sensible. It is not within my province to dwell upon many of the beneficial reforms which he introduced, but I may be permitted to observe, that in nothing was improvement more obvious, under his auspices, than in the clothing of the troops, a point intimately connected with their health. At the commencement of the revolutionary war, the dress of our soldiers was a compound of all that was most inconvenient; a cocked hat, perched upon the summit of a

powdered head, and a long queue protruding from beneath it; a long coat, reaching to the ankles, and meeting at a single point in front; waistcoat and breeches kept white by the perpetual application of pipe-clay, wet or dry; and long gaiters, requiring a large portion of a man's lifetime to button, were then the general costume of the army. It was under the administration of our late Commander-in-chief that these were exchanged for the cap and the crop, the jacket and the grey trowsers—it was, in short, under that illustrious prince, that our men were made "warriors for the working day."

The superiority of our discipline and appointments were fully established when our troops were, upon a recent occasion, serving in the metropolis of France with the flower of the European forces; and the medical officers of foreign powers were also ready to admit the excellence of our hospital arrangements, but they expressed a degree of surprise that our field apparatus and medical equipments were not equally complete and effective—*Fas est et ab hoste doceri.*

Although, Gentlemen, you will not, I trust, find me disposed to under-rate the importance of those surgical subjects on which I propose to enter

at our next meeting, I cannot conclude this department of the course without bringing to your recollection, that, in the words of Johnson, "war has means of destruction more formidable than the cannon and the sword. Of the thousands and tens of thousands that have perished, how small a proportion ever felt the stroke of an enemy!" At the same time it is consolatory to reflect, that even in seasons the most inclement, under privations the most severe, in climes the most ungenial, and encampments the most unwholesome, the resources of our profession have been successfully opposed to the disasters inseparable from the pursuit of war. Upon two important occasions, on both of which my excellent friend Mr. Young was at the head of the medical staff, it has been said to his praise, that "the worst calamities of war had little or no place either amid the swamps of Holland or on the burning sands of Egypt: in the former, of four thousand and eighty-eight sick and wounded, who were at one time in the hospitals, only eighty-nine died; in the latter, out of twenty-four thousand patients, we lost only seventeen hundred."

I would now, before concluding these preliminary remarks, beg leave to observe, that there is one other subject, which perhaps might, without impropriety, have found a place in this introduc-

tory division of the course. I allude to what has been termed Medical Topography; but the consideration of this, I am at present induced to defer, partly from having hitherto been unable to avail myself of the sources of information which I already possess, and partly from my being in immediate expectation of more. A distinguished Member of Parliament has undertaken to procure for me the valuable papers relative to the Walcheren expedition, printed by order of the House of Commons, in 1810; and of these I may perhaps be able to avail myself even before the termination of the present course. We have also reason to expect, very soon, an important work on the medical topography of Gibraltar and the Ionian islands, from the pen of the late lamented Dr. Hennen, and, judging of his qualifications for this undertaking, from some topographical reports made by him on the military stations in North Britain, of which I possess manuscript copies, I naturally anticipate that this forthcoming work will enhance the well earned reputation of its author. But although unable to offer you any summary or abstract of the information already obtained on the subjects of medical geography and topography, I may be permitted to advert to the importance which these subjects have assumed, not only in the eyes of professional men, but as a branch of military education in general.

The following is a limited, and but very imperfect sketch of the light in which this subject is placed by a recent writer on military education in one of the leading periodicals of the day. "It is impossible that an officer can be too intimate with all that is comprised under the heads of geographical and statistical knowledge in a country which is the seat of war, such as the agriculture, the seasons, the climate, the nature of the winds, and weather; the state of the soil as to moisture and dryness; the mineralogical or geological character; the population, under all its circumstances and distribution, numbers and character; and more than it is here needful to enumerate. While there are many things capable of affecting an army which depend on climate, soil, season, physical geography, and so forth, there is not one more deeply important than that which relates to the power of these, separately or combined, in affecting the health of troops." And in reference to the want of information on these points, which has sometimes been conspicuous, he observes, that "Of the morals, the dwellings, the food, the commerce of foreign countries; an officer may possibly have heard that a Portuguese carries a long knife, eats garlic, sells port-wine, and buys bacalhao; while,

if he be destined to serve in India or Africa, he may discover, after the loss of five or ten thousand men, that the sun is very hot at mid-day, that a monsoon shifts the wind in his teeth, blows across a jungle, and poisons half his camp; that his bridge of communication is very surprisingly washed away by an inundation foreseen by every one but himself; and that the half of the army which is not poisoned by rice fields, is starved because his troops cannot get bullocks to eat; and his transports cannot reach the shore or lie in harbour at the time he wants them."

These general views of the subject are then illustrated by a reference to many special instances of the disasters which have befallen armies, and of the grievous and humiliating results in which their exertions have terminated, from "persevering obstinacy and conceit, the produce of ignorance determined never to learn." Amongst these illustrations, the memorable disasters of our army in 1809, are ever uppermost, in the progress of an expedition, which, says this writer, "planned and conducted as it was, was the fruit of statistical ignorance in every one, every where, from the prime minister to the commander-in-chief, and from him to the surgeon's mate."

In this last reflection, however, I am by no means prepared to concur, for whatever may have been

the faults or the failings of the heads of the medical department of that day, I am persuaded that there was scarcely an hospital mate employed on the expedition who could not have foretold the evils which befel them. The fatality attendant upon that expedition was in a great measure the result of that state policy which has in too many instances prevented the destination of troops from being made known to those who are nevertheless held responsible for their health and their lives. From this responsibility no medical officer will be disposed to shrink, provided he is treated with that confidence, the want of which our department has too often had occasion to deplore. But then it must be distinctly felt, that, in what concerns the health of an army, the praise or blame must peculiarly belong to the medical superintendant, in as far as events, whether prosperous or otherwise, depend upon causes of which professional skill alone is competent to judge. The hospitals, of course, should be just as much under the inspector-general, as the arrangements of the field are under the commander-in-chief; and, consequently, any peculiarity of success in the recovery of the sick and wounded would be as much to the appropriate praise of the former, as the wise array of a battle or a siege redounds to the distinct honour of the latter.

I am well aware, Gentlemen, that there is no other department in the whole circle of medical science in which personal experience is so indispensable to the successful exertions of the practitioner, as in the province of military surgery; but I am equally aware that, in this as in other cases, your minds may be prepared by previous study for receiving the lessons of experience, and that here as elsewhere, it is only upon a firm and extended foundation that you can raise a valuable or permanent superstructure.

If such extent of information as that to which I have recently alluded, is deemed requisite for every officer of the line, how much more is it incumbent on the medical officer to make himself acquainted with circumstances upon the knowledge of which the successful discharge of his duty so essentially depends. Of no individual in an army can it be more truly said, that, in the progress of time and events, there is not a single man on whom a call may not be made for the exertion of faculties and acquisitions of great variety and extent, and on whose knowledge there may not depend the lives of hundreds of thousands, the expenditure of millions, and, finally, the security or downfall of the state to which he belongs.

It has been very justly observed, that "an easy access to books; a knowledge of their characters and authors; the power of obtaining them without effort—indeed the fact of their being absolutely thrown in our way, are essential to reading—even to the desire of reading, upon many subjects; while the sense of the necessity, and the desire also are apt to disappear under very trifling difficulties." But I would remind you that, "Books will speak plain when counsellors blanch; therefore it is good to be conversant in them, specially the books of such as themselves have been actors upon the stage."

You have seen by the numerous references in this introductory division of the course, and you will see still more, I trust, before its conclusion, what an extensive field lies open to the industrious student of military surgery. However others may be satisfied with their knowledge of this subject, and however little they may suppose there is to be taught in a course of this kind, I, for one, have only to regret, that after more than twenty years assiduous attention to the study and practice of this branch of science, my knowledge of it should yet remain, so far from being perfect. If any be disposed to deny the peculiarities of military

practice, or to underrate the difficulties with which military and naval surgeons have to contend, I would beg of them to turn to the list of works annexed to these Lectures, I would ask them for what purpose these numerous volumes have been written, and with how many of them they are acquainted.

Let me then, Gentlemen, advise you, while you have it yet in your power, to give your attention to a subject, the knowledge of which must be as beneficial to your country, as it will be creditable to yourselves. Let me call upon you to bear in mind the advanced state of education in general, and the progress which the officers of the British army have recently made in reading, in learning, and in science. Let me tell you, that hitherto the surgeon of a regiment has been looked upon by his brother officers as a man of superior education and intelligence; and let me assure you, that if he means to support this character, and to keep this vantage ground, it behoves him to consult his books, to extend his views, and to bound his inquiries by the limits of science alone.

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The foregoing list, it is believed, will be found more complete in the names of Authors than any of the same kind hitherto published.

The titles of books are in many instances purposely abridged; but, in others, it is feared that they will be found incomplete or inaccurate, from being unable to refer to the original works.

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Page 15, line 19, *for* secretary, *read* secretory.
—— 70, — 16, *for* eighty-sixty, *read* eighty-six.
—— 90, — 4, *for* d'œiul, *read* d'œil.
—— 105, — 1, *for* manquer, *read* manquerent.
—— 129, — 3, *for* seems, *read* seem.
—— 144, — 6, *for* la Masion Royale de la Charite, *read* la Maison Royale de la Charité.
—— 174, — 13, *for* born, *read* borne.