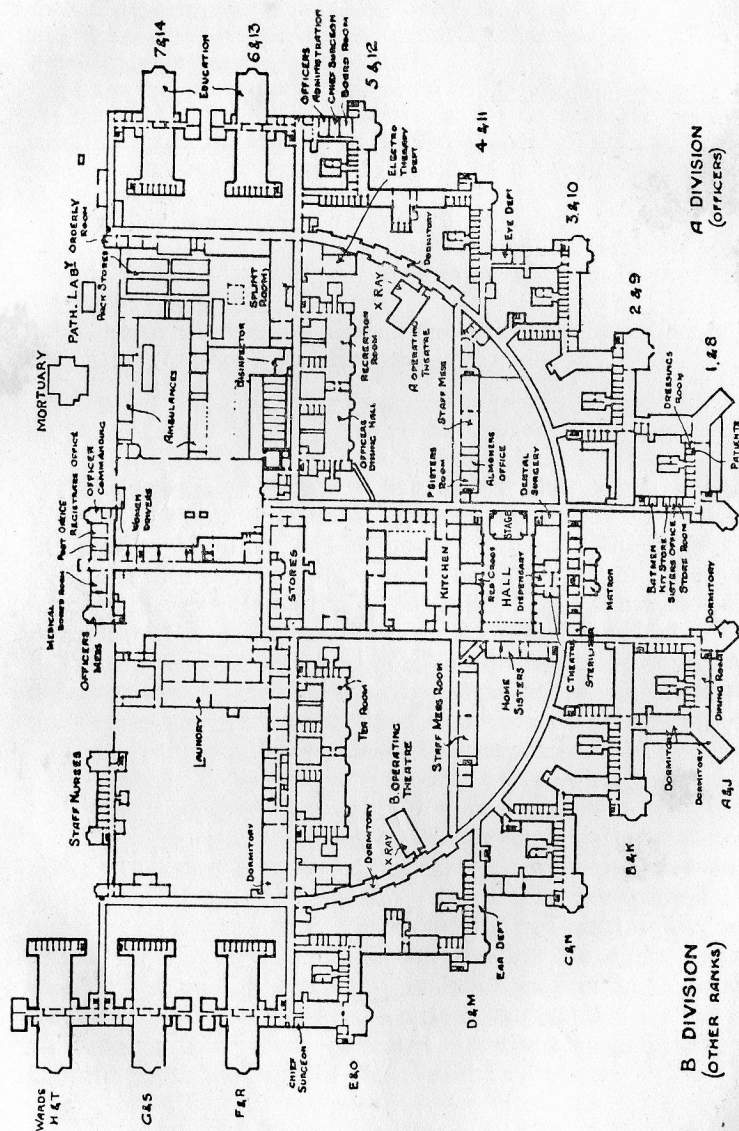




War Hospital Ground-Floor Plan. (W. C. Clifford Smith, F.R.I.B.A.)
Scale, 250 ft. to 1 in.

PART II—SOME SPECIAL SECTIONS OF THE HOSPITAL'S WORK.

I.

OFFICERS' CLINIQUE AND SPECIAL SURGICAL TREATMENT CENTRE.

Administrator.

Lt.-Col. J. R. Lord, M.B. Edin., R.A.M.C.

Surgeon-in-Chief.

Major G. E. Waugh, F.R.C.S. Eng., R.A.M.C., Senior Surgeon,
Sick Children's Hospital, Gt. Ormond St., London.

Sub-Administrative Officer.

Major E. G. Gowlland, D.S.O., M.B. Lond., R.A.M.C.

Neurologist and Chief Physician.

Capt. S. A. Owen, M.D. Camb., R.A.M.C., Physician, Out-patients,
City of London Hospital.

Consulting Ophthalmologist.

Mr. C. Higgins, F.R.C.S. Eng.

Assistant Surgeons.

Capt. H. Chapple, F.R.C.S. Eng., R.A.M.C., Obstetric Surgeon,
Guy's Hospital.

Capt. A. R. Finn, F.R.C.S. Eng., R.A.M.C.

Capt. J. D. Oliver, F.R.C.S. Eng., R.A.M.C.

Capt. H. B. Morgan, M.B. Glas., R.A.M.C., Orthopædics.

Ophthalmic Surgeon.

Capt. J. H. Mason, M.B. Vict., R.A.M.C.

Aural Surgeon.

Capt. P. Ferguson, F.R.C.S. Eng., R.A.M.C.

Pathologist.

Capt. R. St. John Brooks, M.D. Lond., R.A.M.C.

Dental Surgeon.

Capt. L. W. Forsyth, L.D.S., R.A.M.C.

Anæsthetist.

Lieut. C. H. Lee, M.B., Vict., R.A.M.C.

Hon. Electro-Therapeutist

Dr. Oreste Sinanide.

Radiographer.

Capt. J. B. Cruickshank, M.B. Aberd., R.A.M.C.

Origin of the Officers' Ward in 1916.—On 4th July, 1916, I received a communication from the A.D.M.S., which stated that there was a pressing need for medical and surgical accommodation for sick and wounded officers transferred from overseas. The casualties among the officers were notoriously high, many of them being severe in type, and needing all the operative and nursing attention of a general hospital and its special departments.

I had every confidence in our medical treatment and nursing, and I was prepared to face any administrative difficulty that might arise. I knew it would mean more work and responsibility, and I was but little acquainted with the management of an officers' hospital. Nevertheless, I resolved to go my own way and make an officers' ward fit in with the general administration, now working smoothly, rather than reproduce something I had not a working knowledge of; later I could re-arrange matters if it became necessary.

There being no detached building of sufficient size available, I selected a large ground-floor ward, hitherto used for men, which had a large verandah and garden. It opened on to one of the main administrative corridors, and was also easy of access from outside. As regards equipment, the standard of furniture and bedding was satisfactory, and only the crockery, cutlery, and table furnishing needed revision. Lady St. Helier kindly provided a library of books, lamps, extra cushions, flower vases, etc., which, with the addition of similar gifts from other sources, made the ward

very cosy and comfortable, without losing that simplicity of furnishing essential to a hospital ward. Side rooms which could be spared provided the cloak room, kit store, larder, and a room for the batmen. The ward administration was not changed. A few patients, other ranks, awaiting transfer to convalescent hospitals were to do duty as batmen. The cooking was left to the general kitchen, to which an additional assistant cook was appointed, who also was to prepare some of the smaller dishes in the ward scullery.

On 28th July, 1916, the first officer patients from overseas were admitted, twenty in number—all cot cases and severely wounded.

I had to create "Hospital Orders for Officers." In this case I had nothing official to guide me, but my aim was to disturb the existing general administration as little as possible. I warned the officers not to expect the services of a special hospital for officers, and pointed out that the accommodation was only of a temporary nature to meet an emergency. They were invited to elect a Mess President, who would be responsible with the M.O. in charge and sister for good order and contentment. One Order only I will quote :—

"Order 4.—It is very advisable that officers should as early as possible become acquainted with the life and routine of the hospital generally. In addition to recreations, light occupations are possible to distract the time; and officers can be of great assistance in maintaining a good tone and discipline in the hospital."

The success of the ward was immediate; and many an officer will look back with pleasure on his stay here. My invitation to the officers to make themselves useful was fruitful in many ways. They organised concerts in the hall, sports on the recreation field, and were not above helping the sister in the ward, while some of them keenly enjoyed keeping the garden in order. This was as I intended it should be, for the active social life of the place and the identification of the patients, both officers and men, with the work and responsibility generally, was an enemy to gloom, hypochondriasis and neurasthenia. At Horton there was no time or place for morbid introspection; patients, in spite of themselves, had to move along with the river of life in which they were plunged.

Officers' Accommodation Increased.—At first I allotted forty beds for officers, but on 10th September, 1916, they rose to fifty-four, and on 27th April, 1917, at the request of the War Office, the accommodation was increased to sixty-four by absorbing an upstairs dormitory. It then became necessary to provide an officers' kitchen, which was readily done by throwing an adjoining room into the ward scullery.

Origin of the Officers' Clinique.—I little expected then that I should later be asked to undertake the organisation of quite a new venture in accommodation for the treatment of sick and wounded officers.

On 10th June, 1918, I was visited by Colonel Sir W. Horrocks, K.C.M.G., of the Army Medical Advisory Board, and Dr. C. Hubert Bond, of the Board of Control. They sketched to me a scheme, which had been prepared by the Army Medical Advisory Board, for securing more centralisation of the treatment of severe cases of sick and wounded officers, especially surgical cases. It was proposed that on arrival in England severe cases of injuries and wounds should be sent to a special surgical-treatment centre, suggested to be created at Horton, and receive at once the best and most advanced methods of treatment by a specially selected staff, and remain there until the critical period was over, the worst symptoms corrected, and a fair degree of convalescence effected. Afterwards the cases were to be transferred to a re-organised Manor War Hospital for further convalescence, late orthopædic treatment, and the physical training necessary to bring the "morale" up to fighting standard again, or, at any rate, to a stage when other training institutions could with better chances of success undertake the final preparation for return to active service.

A "Chef de clinique" was to be appointed with a team of surgeons and specialists, while I would be responsible for the administration.

On 12th June, the Army Medical Advisory Board, comprising Colonel Sir W. Horrocks, Major-General Sir B. G. A. Moynihan, Colonel Sir Robert Jones, and Colonel Sir H. Styles, accompanied by Mr. Gann, the Secretary, inspected "A" Division of the hospital and the general administration. I was very keen to be identified with what I thought to be a

splendid advancement in the treatment of officers, but rather dismayed at first and doubtful of my ability to carry it through. However, the preceding forty-eight hours having been devoted to furious thinking, I was able to indicate roughly to the Board the lines I proposed to go upon if the accommodation was thought to be satisfactory. The Board was charmed with the officers' ward, and abundantly satisfied with the wards, administrative buildings, and the situation generally, and made up their minds to recommend to the Director-General that "A" Division should be selected and re-organised for the purpose they had in view. I was told to prepare a scheme of administration, measure up the accommodation, having regard to the new class of patients, and generally be prepared for further orders.

The Asylums Committee were approached by the Board of Control, and readily promised their co-operation. The Chairman, Mr. Greenwood, the Clerk, Mr. Keene, and the Sub-Committee generally, were very pleased at what they considered to be a token of appreciation by the War Office of the work of the hospital.

Order to Proceed Received.—On 26th June, I received a wire not to admit any more patients to "A" Division until further orders. I stopped all admissions except local cases, and commenced filling up the vacancies as they arose in "B" Division from the patients in "A" Division.

In the meantime I was rapidly completing the details, both administrative and financial, of a working arrangement, to carry out the new venture, and was in close communication with Mr. W. C. Clifford Smith.

On July 5th, Major-General W. W. Pike, K.C.M.G., D.D.M.S., inspected the hospital with the A.D.M.S., and went into the details of the proposed alterations with me.

By 10th July, A Division was practically clear of patients, and I had completed my work with the Engineer. The estimated cost of the structural alterations, exclusive of a new operating theatre, was £1,810; direct asylum labour to be employed. Sir William Horrocks again visited on 18th July, and introduced me to Mr. G. E. Waugh, F.R.C.S., who was the proposed "Chef de clinique," and Capt. R. Milne, F.R.C.S., R.A.M.C., who was to be chief surgeon at the Manor War Hospital.

On 23rd July, Lieut.-General Sir William Goodman, K.C.B., Director-General, accompanied by Col. A. L. A. Webb, C.B., Assistant Director-General and Col. Sir W. Horrocks, made a final inspection. He appeared quite satisfied and pleased with the proposed accommodation and suggested administration, and told me to get along with it as quickly as possible.

Clinique is Organised.—On 27th July, Major G. E. Waugh, F.R.C.S., R.A.M.C., came into residence. The surgeons and specialists who were to form Major Waugh's team followed, and I allotted them the medical officers' south block as a residence. Major E. G. Gowlland, D.S.O., R.A.M.C., was already on the staff, and a commencement was at once made by them on the additional medical and surgical equipment that would be necessary. In this respect efficiency was to be the guiding factor. Everything which would enable the most up-to-date treatment to be given was to be obtained. In a large measure we were successful, and the clinique was eventually equipped, with few exceptions, with the most modern instruments, fittings, and appliances.

I will now describe briefly the structural alterations, etc., which were deemed necessary. In these matters I had to bear in mind that the cases would largely be bed cases, and only a few would be up and about at one time. They would, as a rule, be seriously, if not dangerously, ill and probably very septic at first. Plenty of elbow room would be needed for extension and suspension of limbs, constant irrigation and frequent dressing of wounds. Having regard to these facts, I found that there could be made available accommodation for 700 cases, which figure was accepted by the Army Advisory Medical Board. It allowed ample day-room space for the few likely to be sitting up but unable to leave the wards. Treatment out-of-doors was facilitated by extra exits leading from the ground-floor wards to the gardens, and the kiosks were lighted with electricity so as to be in constant occupation by suitable cases. In every ward ample electric current was made available for electrical treatment, and each ward surgical-room was provided with additional fittings, such as an electrical steriliser for instruments, and an electrically-heated kettle for a continuous supply of sterilised water, etc. The number of baths in

most of the wards was doubled, and hot-water service supplied wherever deficient. Every ward was thoroughly cleansed and repainted, distempered, or repapered where necessary. The original officers' ward was copied as regards the provision of kit stores, cloak rooms and accommodation for batmen. Very soon the wards assumed almost the appearance of factories, with Balkan splints, wood posts, scaffolding, etc., for the suspension of limbs. The large internal working-ward, consisting of two rooms of considerable size, became a general mess-room, one of the rooms being reserved as a dining room, the other room being fitted up as a common room with billiard table, comfortable chairs, settees, writing-tables, card-tables, etc. Attached to the latter was a barber's shop and a library. An up-to-date kitchen and serving room was formed out of rooms at one end of the dining room. A dormitory of one of the wards situated in the centre of the new clinique was divided up to form an administrative centre, comprising a medical board room, and offices for the Surgeon-in-Chief, Sub-administrative Officer, and clerks, and also a telephone centre.

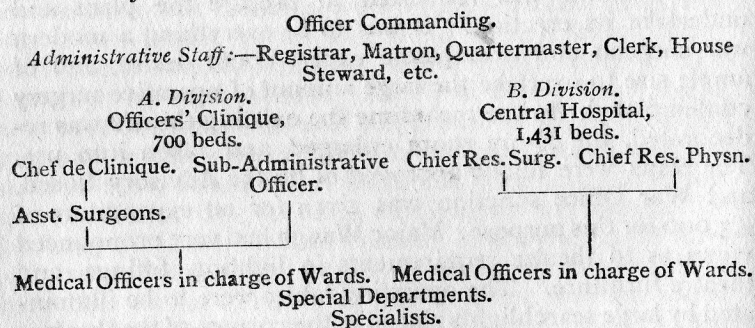
The Army Medical Advisory Board were strongly of the opinion that another theatre was required, and Mr. W. C. Clifford Smith was requested to prepare the plans and undertake its erection. It was to be everything a modern war surgeon and orthopaedic expert could desire, and of ample size to overtake the large amount of operative surgery contemplated. In the meantime the existing theatre was re-decorated, the X-ray room enlarged and taken into use. The plans were finally approved of by the Advisory Board, and War Office sanction was given for an expenditure of £3,000 for this purpose. Major Waugh had very pronounced views as to theatre requirements in lighting, fittings, and theatre furniture. The operating tables were to be illuminated by large searchlights placed in the corners of the theatre; they were to be heated by electricity, and also of a type easily adjustable to any height or angle. It seems rather wonderful to relate that the structure never rose from its foundations owing to the impossibility of persuading a timber autocrat at Hull to release the necessary materials for the superstruction. Fortunately the existing theatre, of which I had a high opinion, proved sufficient for the requirements of the clinique. After the Armistice the erection of the

new theatre was abandoned and the foundations removed. Only the plans remain, to form a valuable addition to theatre architecture.

The dental, electro-therapeutic, and pathological, departments were re-organised to some extent and supplementary equipment obtained.

Fractured Femur Centre for Officers.—In October, 1918 the hospital was selected as an "officers' fractured femur centre" (A.M.D. 2a/5366, dated 4th October, 1918), and steps were taken to acquire the special equipment required. Great success had attended the method of treatment adopted at such "femur centres" at home and abroad. Preparations were well in hand, and the surgeons had received instructional courses at other centres, when the idea was abandoned, for it had now been decided to retain these cases in France until bony union had taken place (A.M.D. 2a/5366, dated 23rd November, 1918).

Administration.—It was obvious that the addition of the officers' clinique would mean some alteration in the general administration of the hospital. The modifications I made can readily be seen from the following diagram:—



Subsequent History.—On 5th August, 1918, I was able to allot 120 beds, and work was commenced in two wards. As the cleansing, alterations, and equipment were completed more wards were brought into use. I made arrangements to tap the other main railway-line running from the coast to London at Esher to take off such officer admissions as were assigned to us, in addition to those received at

Epsom. Early in October I had allotted 200 beds, and evacuation of convalescents to the Manor War Hospital commenced. Convoys of officers became frequent occurrences, and beds were kept well occupied. Further beds were subsequently allotted, and although large numbers of officers were dealt with we had not got into full stride when the Armistice was signed. Useful and very satisfactory work continued during 1919 until March, when the demobilisation of the clinique staff commenced and work resumed as in an ordinary officers' hospital. We became an officers' dispersal centre for some months, and the last military patient to leave hospital on 24th October was an officer.

The success of the officers' clinique, as far as it could be brought into operation, was unmistakable. It was a great pity it did not come into being earlier in the war, for I feel sure that some such scheme would have added materially to the efficiency of war-surgery and would have been of considerable educative value.

Appreciation of Work of Clinique Staff.—Major Waugh brought a wealth of experience of bone surgery and a freshness of views and methods that were at once illuminating and instructive. His ideals were high, his work thorough, and his one idea the success of the important surgical department the clinical direction of which had been entrusted to him. He was well supported and ably assisted by the assistant surgeons and others of his staff. Major Gowlland combined strength of character with charming manner and abundance of tact, and was deservedly popular with the officers. His administration left nothing to be desired.

II

SOME STATISTICAL MATTERS

By the time it was possible to commence this record, many of the volumes of the admission and discharge registers (Army Books 27 and 27a) had been forwarded to the Medical Research Committee, and were not immediately available for the purpose of preparing the statistics of the admissions. Furthermore, had they been so, it would have been a long and laborious undertaking, and of doubtful accuracy considering the time at my disposal. These registers were very numerous, owing to the fact that the different contingents of the expeditionary forces (Regulars, Australian, Canadian, etc.), according to the seat of warfare (France, Egypt, Salonika, Mesopotamia, Italy, etc.), had separate books; so, likewise, had the Regular and Colonial Forces employed in the United Kingdom. Separate records had also to be kept for officers. Over thirty books were in current use, and the ultimate number completed was seventy-nine.

Two sources of information remained at the hospital—the card-index record of patients, and the office copies of A.F.W. 3227, which had been rendered to the War Office monthly. Both as an actual fact were used.

ADMISSIONS.

An Imperial Gathering.—The total number of military patients (including naval ratings) admitted, according to A.F.W. 3227, can shortly be summarised as follows:—

Officers	1,820
Other ranks	42,773
Military Nurses, etc.	20
	44,613

Of these, 1,645 officers and 38,364 other ranks—total 40,009, were transferred from the various overseas seats of warfare, and 175 officers and 4409 other ranks—total 4,584,

from the United Kingdom. The Regular and Territorial Forces contributed 1,616 officers and 34,804 other ranks—total 36,420, and the Colonial Contingents 195 officers and 7,924 other ranks—total 8,119. Soldiers from the Southern Hemisphere were slightly more numerous than those from the Far West. Before the hospital closed practically every part of the Empire had been represented in the admissions, and also the United States of America.

Civilian Patients.—It was necessary to admit from time to time civilians who had met with serious accidents, and who were unfit to be removed except to the nearest hospital; also visitors and outdoor employees taken seriously ill while in the hospital and unfit to be removed home. We had in addition to provide accommodation for serious cases of illness or injury occurring amongst civilians in receipt of pay from army funds and entitled to hospital treatment at public expense.

Regard too must be had to sickness arising among the large indoor staff, which, had they been in the direct pay of the War Office, would have been admitted as in-patients.

Total Indoor Patients of all Classes.—It is calculated that the hospital treated as indoor patients a total of 45,686 persons. However, for the purpose of the medical statistics, the admissions have been taken as 44,613, which is an accurate figure for this purpose (*vide* Table I). The dialects spoken by the soldier patients were varied and numerous. At times, for quite long periods, we could imagine ourselves as being in Scotland or the North or West of England, while at other times we had difficulty in not feeling that we were far away in Australia or the Americas.

The Busiest Time.—The busiest time was from late spring in 1916 to May, 1918, two years and two months, during which the average number resident rarely fell below 2,000 patients. As a rule, the numbers were about 2,300, and the resources of the hospital were taxed to the limit, but it was only for a short period during the spring offensive of 1918 that practically every bed was occupied. Only an extraordinary combination of circumstances could have filled the hospital to the doors, because a certain number of beds were reserved for special types of cases—eye, ear, mental,

etc. Except for the one incident in September, 1915, recorded on page 44, I never refused a convoy, and no consideration of reserved beds prevented me from using the full accommodation for convoy cases when necessary. The men broken at the front were always the first and prime consideration.

Table III gives the highest and lowest number of patients and date for each year, also the average number resident. The fall in the average number during 1918 was due to one-half of the hospital being cleared of patients in August as a preliminary to the establishment of the officers' clinique.

Table IV gives the incidence of the principal diseases and injuries from which the patients suffered and the prevalence of each. It will be dealt with in the medical and surgical sections.

DEATHS.

Main Causes.—It will be seen from Table II, that out of a total of 351 deaths the outstanding causes were injuries in 131 instances, or 37·6 *per cent.*; influenza and pneumonia in 71 *per cent.* instances, or 20·2 *per cent.*, and tuberculosis in 39 instances, or 11 *per cent.*, and that these causes accounted for more than half of the total fatalities, *i.e.*, 68·6 *per cent.*

The war directly accounted for 54 *per cent.* of the deaths from such causes as wounds, fractures, trench feet, trench nephritis, gas poisoning, gas gangrene, tetanus, septicæmia, erysipelas, etc., and indirectly for 16 *per cent.* of the deaths in which cases, no doubt, exposure and stress of war was a main factor in the development of tuberculosis, bronchitis, acute myelitis, and at least twelve cases of influenzal pneumonia, while the remaining 34 *per cent.* can fairly be said to have died from natural causes which would have operated in any case.

Several interesting and rather rare diseases of an incurable type make their appearance in the death table, such as Landry's paralysis, hæmophilia, leukæmia, and lymphadenoma.

Death Rate: Patients.—The percentage of deaths to the total number of admissions was '8, or 351 out of 44,613 patients treated. This is a remarkable figure, and would have been still considerably less but for the unfortunate epidemic of influenza and pneumonia which raged during the late months of 1918 and the early months of 1919.

Successful Treatment.—It must be remembered that the patients were largely drawn from class A men, in the military classification, and had been fortified to resist disease and endure hardships by training; yet, after having regard to this, the small number of deaths is an eloquent testimony to the skill of the doctors and the thoroughness of the nursing, and points especially to the splendid advances made in surgical treatment of injuries and wounds. At the risk of repetition, I cannot refrain from pointing out here that, although the casualties from wounds and other injuries were well sustained until the Armistice, the deaths from this cause decreased gradually almost 50 *per cent.*, as will be seen from the following comparison:—

	1915 (9 months)	1916	1917	1918
Admitted for injuries	2825	5303	5710	4890
Deaths from injuries	8	56	40	22

During 1915 the surgical cases evacuated to England were of a lighter type than during subsequent years.

The annual death-rate for the whole period, calculated on the average daily number resident, was 4·4 *per cent.* It was highest in 1916, due to casualties from severe wounds, while during 1918 influenza and pneumonia brought it up to almost the same as in 1916.

Death Rate: Staff.—Deaths among the resident staff were remarkably few until 1919, when the women, exhausted by the influenza outbreak, yielded three of their number as victims to this dreadful scourge. Prior to that we lost only one sister, who died from a constitutional cause not concerned with her duty as nurse, and a probationer nurse from enteric fever. It is indicative of a high degree of professional training that the nurses escaped the many chances of fatal blood poisoning they were hourly exposed to in the exercise of their duties. The death-rate during the whole period was '21 *per cent.* of the average female staff resident, three-fourths of which was due to influenzal broncho-pneumonia after the Armistice was signed.

Inquests on Patients.—All deaths from injuries were notified to the Coroner and he held enquiries on eight occasions. Three cases died during operation, and in one only was the chloroform held largely responsible. This is

TABLE I.—Continued.

		TOTAL ADMISSIONS.			
		From Overseas.		United Kingdom.	
Year.		Officers.	Men.	Officers.	Men.
1915		—	5535	—	362
1916		120	9976	4	707
1917		310	9709	26	908
1918		837	8118	91	1530
1919		378	5026	54	902
Totals		1645	38364	175	4409
				44593 (+ 20 Nurses)	

All Ranks.	
Officers ...	1820
Men ...	42773
Nurses ...	20
Total	44613

TABLE II.—DEATHS.

CAUSE OF DEATH.	1915		1916		1917		1918		1919		Total.	
	Officers	Men	Officers	Men	Officers	Men	Officers	Men	Officers	Men	Officers	Men
<i>Diseases caused by Infections—</i>												
Dysentery ...	—	1	—	1	—	—	—	—	—	—	—	2
Enteric ...	—	1	—	—	—	—	—	—	—	—	—	1
Erysipelas ...	—	—	—	—	—	—	—	—	1	—	—	1
Gas Gangrene ...	—	—	2	—	7	—	—	—	—	—	9	9
Influenza ...	—	—	—	—	—	—	1	5	—	4	1	10
Malaria ...	—	—	—	—	—	—	—	3	—	—	3	3
Septicæmia ...	2	—	—	—	—	—	3	—	—	—	5	5
Syphilis ...	—	—	—	—	—	—	1	—	—	—	1	1
Tetanus ...	—	1	—	1	—	—	—	—	—	—	2	2
Tuberculosis ...	—	2	—	9	15	—	7	—	6	—	39	39
<i>Diseases of the Nervous System—</i>												
Cerebro-Spinal Meningitis	—	—	—	—	1	—	—	—	—	—	1	1
Cerebral Abscess ...	—	—	1	1	—	—	—	—	—	—	1	1
" Haemorrhage ...	—	—	—	—	—	—	—	—	1	—	1	2
General Paralysis of Insane	—	—	—	—	—	—	1	—	—	—	2	2
Acute Landry's Paralysis ...	—	—	—	—	1	—	—	—	—	—	1	1
Meningitis ...	2	—	—	2	—	—	—	—	—	—	4	4
Acute Myelitis ...	—	—	—	—	—	—	—	—	—	—	1	1
<i>Diseases of the Ear—</i>												
Mastoid Disease ...	—	2	—	—	—	1	—	—	—	—	1	1
Otitis Media ...	—	—	—	—	3	—	—	—	—	—	5	5
<i>Diseases of Circulatory System—</i>												
Aneurism ...	—	—	1	—	—	—	—	—	—	—	1	1
Acute Endocarditis	—	—	3	—	4	—	1	—	—	4	12	12
" Pericarditis...	—	1	—	—	—	—	—	—	—	—	1	1
Valvular Heart Disease ...	—	—	1	1	—	—	2	—	2	—	5	6

TABLE II.—DEATHS (continued).

CAUSE OF DEATH.	1915		1916		1917		1918		1919		Total	
	Officers	Men	Officers	Men	Officers	Men	Officers	Men	Officers	Men	Officers	Men
<i>Diseases of the Blood—</i>												
<i>Hæmophilia</i> ...	—	—	—	—	—	—	—	—	—	—	—	—
<i>Diseases of the Lymphatic System—</i>												
Leukæmia ...	—	—	—	—	—	—	—	—	—	—	—	—
Lymphadenoma ...	—	—	—	—	—	—	—	—	—	—	—	—
<i>Diseases of the Respiratory System—</i>												
Asthma ...	—	—	—	—	—	—	—	—	—	—	—	—
Bronchitis ...	—	—	—	—	—	—	—	—	—	—	—	—
Empyema ...	—	—	—	—	—	—	—	—	—	—	—	—
Septic Pharyngitis ...	—	—	—	—	—	—	—	—	—	—	—	—
Pneumonia (chiefly influenza) ...	—	—	—	—	—	—	—	—	—	—	—	—
<i>Diseases of the Digestive System—</i>												
Appendicitis ...	—	—	—	—	—	—	—	—	—	—	—	—
Dilatation of Stomach ...	—	—	—	—	—	—	—	—	—	—	—	—
Hernia of Stomach ...	—	—	—	—	—	—	—	—	—	—	—	—
Intestinal Obstruction ...	—	—	—	—	—	—	—	—	—	—	—	—
Ulcer of Stomach ...	—	—	—	—	—	—	—	—	—	—	—	—
" Duodenum ...	—	—	—	—	—	—	—	—	—	—	—	—
Subdiaphragmatic Abscess ...	—	—	—	—	—	—	—	—	—	—	—	—
Chronic Peritonitis with effusion ...	—	—	—	—	—	—	—	—	—	—	—	—

TABLE II.—DEATHS (continued).

CAUSE OF DEATH.	1915		1916		1917		1918		1919		Total	
	Officers	Men	Officers	Men	Officers	Men	Officers	Men	Officers	Men	Officers	Men
<i>Diseases of the Urinary System—</i>												
Acute Nephritis ...	—	—	—	—	—	—	—	—	—	—	—	—
Nephritic and Perinephritic Abscess ...	—	—	—	—	—	—	—	—	—	—	—	—
<i>Disorders of the Metabolism—</i>												
Diabetes ...	—	—	—	—	—	—	—	—	—	—	—	—
<i>Injuries—</i>												
Fractures ...	—	—	—	—	—	—	—	—	—	—	—	—
Trench Feet ...	—	—	—	—	—	—	—	—	—	—	—	—
Wounds (chiefly G.S.W.)	—	—	—	—	—	—	—	—	—	—	—	—
<i>Tumours and Cysts—</i>												
Sarcoma ...	—	—	—	—	—	—	—	—	—	—	—	—
Carcinoma ...	—	—	—	—	—	—	—	—	—	—	—	—
<i>Poisoning—</i>												
Oxalic Acid ...	—	—	—	—	—	—	—	—	—	—	—	—
Gas Poisoning ...	—	—	—	—	—	—	—	—	—	—	—	—
Totals	0	31	1	93	2	84	4	90	2	44	9	342

Annual death-rate *per cent.*
calculated on the daily
average number resident

2'66 5'58 3'93 5'55 4'31
Percentage of deaths to total number under treatment, '8.

TABLE III.

Year	DAILY NUMBERS RESIDENT.					Date	Lowest	Average	Total Average
	Highest	Date	Lowest	Average	Total Average				
1915	Officers	...	...	...	...	...	...	...	...
	Other ranks	...	...	...	...	...	...	...	...
1916	Officers	...	...	...	...	...	...	...	...
	Other ranks	...	...	...	...	...	...	...	...
1917	Officers	...	...	...	...	...	...	...	...
	Other ranks	...	...	...	...	...	...	...	...
1918	Officers	...	...	...	...	...	...	...	...
	Other ranks	...	...	...	...	...	...	...	...
1919	Officers	...	...	...	...	...	...	...	...
	Other ranks	...	...	...	...	...	...	...	...

Highest number of patients—2507 officers and men—was recorded on 4th April, 1918.

TABLE IV.

PRINCIPAL DISEASES AND INJURIES TREATED.

Diseases and Injuries.	1915	1916	1917	1918	1919	Totals
Trench Fever ...	11	134	269	572	80	1066
Diphtheria ...	1	6	4	16	2	29
Typhoid & Paratyphoid	341	13	1	1	11	367
Influenza ...	207	251	206	845	685	2194
Measles & Scarlet Fever	8	3	10	9	6	36
Cerebro-Spinal Fever...	—	1	—	1	—	2
Dysentery ...	321	83	17	4	19	444
Mediterranean Fever ...	—	7	—	9	—	16
Malaria...	37	145	370	193	1361	2106
Rheumatic Fever ...	159	239	78	90	42	608
Tuberculosis ...	44	72	41	61	37	255
Diseases of the Nervous System ...	157	361	143	135	109	905
Mental Diseases and Shell Shock ...	5	19	51	128	44	247
Diseases of the Eye, Ear, Nose and Throat	208	596	672	613	442	2531
Heart Diseases, etc. ...	233	540	221	203	436	1633
Pneumonia ...	23	72	52	49	61	257
Bronchitis and Asthma	209	468	456	422	326	1881
Digestive Disorders ...	228	419	327	337	310	1621
Hernia ...	153	118	68	33	103	475
Skin Diseases, including Scabies ...	62	339	156	128	110	795
Cellulitis, Furunculosis, Septic Glands, etc. ...	156	350	523	435	305	1769
Nephritis, etc. ...	101	219	259	141	66	786
Venereal Diseases ...	5	22	16	8	4	55
Disorders of Locomotion and Myalgia...	136	442	287	261	363	1489
Sunstroke ...	7	10	2	—	27	46
Trench Feet ...	—	228	298	107	5	638
Gas Poisoning ...	23	46	495	615	28	1207
Injuries:—						
Gunshot and other wounds, Fractures and Dislocations, Contusions, etc. ...	2825	5303	5710	4890	847	19575
Other Diseases ...	237	301	221	270	551	1580
Total ...						44613

III

DEPARTMENT OF SURGERY

Officers in charge of Surgical Divisions and Chief Resident Surgeons.

Major R. G. Riches, R.A.M.C. (until 11th July, 1917).

Major A. Paling, F.R.C.S. Eng., R.A.M.C. (until 24th May, 1918).

Major H. Robinson, F.R.C.S. Eng., R.A.M.C. (from 12th April, 1917).

Resident Anæsthetists.

Dr. A. de Winter Baker (until 3rd May, 1918).

Dr. H. L. Noel Cox (until 20th May, 1917).

Dr. J. Cooper Wilkinson (from 16th June, 1917).

The surgical work recorded in this chapter relates chiefly to the two large surgical divisions, each comprising roughly 1,000 beds. It also includes that done in the officers' clinique since August, 1918.

The following visiting surgeons did a considerable amount of operative work, especially in early days:—

Mr. W. S. Fenwick, M.S. Lond., F.R.C.S. Eng., Assistant Surgeon, Charing Cross Hospital,

Mr. R. Warren, M.Ch. Oxon., F.R.C.S. Eng., Assistant Surgeon, London Hospital,

and, later in the war, the chief resident surgeons were considerably assisted by:—

Capt. A. E. Quine, F.R.C.S. Eng., R.A.M.C.,

Capt. J. D. Oliver, F.R.C.S. Eng., R.A.M.C.,

of the resident staff.

The Australian surgeons attached to the hospital during 1915 and 1916 did excellent operative work, and all the visiting surgeons in charge of wards and resident medical officers, military and civilian, gave valuable assistance to the chief resident surgeons in the operating theatres, and undertook themselves a not unimportant share of the opera-

tions. The great bulk, however, of the operative work was done by the chief resident surgeons personally.

Nature of Injuries and Causes.—Table IV, in the section on "Some Statistical Matters," shows that 19,575 patients were admitted suffering from injuries. Of these 17,152 were mainly cases of gunshot, shell or rifle-bullet wounds, the remainder being sword, lance or bayonet wounds. They were classified in the records according to the region of the body injured, and whether simple flesh wounds (slight or severe), or involving fracture of bones, or penetrating the various internal organs, or involving damage to joints, large arteries, and nerves. According to the region or structures involved, so were the effects severe as regards the time taken to recover, and the extent of temporary or permanent incapacity. There were comparatively few cases of simple fractures and injuries not associated with wounds. Of the 2,423 cases remaining, some 2,388 were suffering from contusions, sprains, fractures, wounds, etc., sustained at times other than when in action, and a few cases of soldier prisoners with self-inflicted injuries.

War-Surgery.—The main objects of the surgeon were to shorten the time under treatment, and preserve man power both for the further prosecution of the war and civilian life afterwards, so when possible the most direct method was taken, namely, by surgical operation.

It is not practicable to classify in the usual way the operations performed. There was an abundance of minor surgery done in the wards every day, of which no central record could be kept, and, furthermore, quite simple surgical procedures in the operating theatres often assumed great proportions and became major operations, because of the extent of the wounds and the length of time taken to perform. In the table of operations which follows, no attempt has been made to follow the usual classification, but it can be taken for granted that they were largely of a major kind.

In each theatre was kept a full record of the operations, together with the form of anæsthesia, also a special record giving full details regarding the latter.

Many of the operations were simple in technique though extensive in character, but a great number could only be described as wonderful, especially those performed in the

region of the heart, or on the heart itself, and in the thorax generally. Practically no region is now immune from the knife of the surgeon, and with the help of Röntgen rays, aseptic methods, and a surety of the subsequent nursing, he will venture almost anywhere.

The more thorough the anatomical and physiological knowledge of the surgeon, the more successful was he in war-surgery. Wherever the missile had gone, in most cases the surgeon, as a rule, had to go after it to remove it or to repair the damage done. A wise discretion was used, and if the foreign body was doing no harm, and not likely to, it was allowed to remain. It thus became an every-day occurrence to have to explore regions rarely entered by the surgeons before. Almost every case of gun-shot wound which called for operation presented a different problem to solve, and the measures adopted had to vary to suit the special circumstances of each case.

Reparative and Orthopædic Surgery.—The reparative, nerve suturing, and orthopædic operations, were most interesting and extremely valuable to the community in restoring the usefulness of injured limbs. Besides an extensive knowledge of anatomy, the surgeon, to be successful, must have considerable mechanical ingenuity backed by courage, and abundant mental and physical endurance. Such operations are often long and tedious and exhausting to the operator.

To speed up recovery septic wounds were frequently bodily excised, and union obtained in a few days by first intention. The same measures were taken with areas of unhealthy bone.

General Surgery.—In addition to the operations especially associated with war injuries, considerable general surgery was done. No operations were undertaken merely to relieve or cure old standing diseases, unless by so doing the patient could be made a useful soldier. Rarely ever did a soldier refuse operation when such was recommended by the doctor, and their *sangfroid* under the circumstances was remarkable. The operations done by the specialists are dealt with in the reports of the various departments, but all are summarised in the following table:—

TABLE OF OPERATIONS.

Bone surgery, platings, resections and reparative operations generally	...	...	...	1156
Removal of bullets and other foreign bodies	...	...	...	907
Ear, nose, and throat	...	...	...	786
Plastic on face and orbit...	...	...	...	769
Amputations and re-amputations	...	...	...	570
Hernia, radical cure	...	...	...	304
Abdominal (except hernia)	...	...	...	284
Eye	...	...	...	161
Special nerve suturings	...	...	...	153
Head and spine	...	...	...	74
Thoracic conditions	...	...	...	28
Aneurisms	...	...	...	16
Other operations	...	...	...	3857

Total operations performed in theatres 9065

Hospital a Carrel-Dakin Treatment Centre.—In January 1917, I received a letter from the War Office (24/Gen. No./5417 (A.M.D.3), dated 30th January, 1917), stating that the hospital, among others, had been selected for the reception of cases from overseas whose wounds were being treated by the Carrel-Dakin method of irrigation. I was directed to allot 100 beds for these cases, and the necessary apparatus was forwarded later. This method of treatment of wounds had been frequently adopted in the hospitals in France, and it became necessary to provide for its continuance during the time the patients were being transported to England and subsequently. Its aim was to render the wound germ-free within a week or ten days, and thus avoid chronic poisoning from prolonged sepsis. The method could also be applied to septic wounds of any duration. The basis of the treatment was simple. The body fluids washed out the wounds, being stimulated by the Carrel-Dakin solution to exude through the wound in sufficient quantities for this purpose and carry with them the germs. The Carrel-Dakin solution was kept flowing through the wound by means of irrigation tubes. The apparatus employed soon became an every day feature of the surgical wards, and this method and subsequent variations, the outcome of experience, were extensively and most successfully used, and I believe many patients were thus saved who would otherwise have been lost.

The progress of disinfection was controlled by frequent bacteriological examinations, the wounds being closed when sufficiently germ free.

It meant, of course, the admission of a stream of severe cases, and a greater strain on the nursing staff, for success depended upon the unremitting attention by the nurses to secure the necessary constant irrigation.

Malachite Green, Proflavine, and Ambrine.—The treatment of septic wounds by malachite green (while obtainable) and by proflavine was productive of excellent results; and Ambrine and "No. 7 Paraffin" also were found useful in chronic wounds, sores, ulcers, and trench foot when other treatment had failed.

Treatment of Burns.—Later in the war many men arrived sadly burned by liquid fire. The method of treatment commonly adopted in severe cases was that devised by Dr. Barthe de Sanport, of Paris. It consisted of the application of flexible paraffin impregnated with antiseptics, which formed a soothing and, at the same time, healing protection to the inflamed areas. Picric acid was the usual treatment in slighter cases.

The "Trench Foot."—Considerable suffering was caused during the winter months of 1915 and 1916 by frost bites and inflammation of the feet, which came to be known as "Trench foot." There was a falling off as regards this condition in 1917 and 1918, the outcome of the precautionary measures adopted in the field. In many cases the pain was severe, and there was total incapacity as regards walking. The toes, and sometimes the whole foot, became gangrenous and had to be amputated. Six hundred and thirty-eight cases were admitted for trench foot only, but the condition prevailed in many other cases in a milder degree.

Tetanus.—One of the most dreadful complications of wounds and severe trench foot was the onset of tetanus. The Army Medical Authorities were early alive to this danger, and a "Memorandum on Tetanus" was compiled in August, 1916, and issued with the authority of the War Office Tetanus Committee. As experience accumulated, a second and then a third revised edition appeared, the latter

in June, 1917, and also a special memorandum for the guidance of nurses.

Arrangements were made for all wounded soldiers to receive a dose of anti-tetanic serum at the earliest possible moment after injury. A second injection had to be given at the expiration of seven days, and further injections at the discretion of the medical officer. It was soon ordered that each wounded soldier should receive at least four injections at seven days interval of time. We had also precise instruction as to treatment by anti-tetanic serum when symptoms of tetanus actually developed. In a hospital of this size the prophylaxis of tetanus added considerably to the work of the medical officer, and careful records were necessary so that injections were not missed. Arrangements were made for the injections to continue on transfer to auxiliary hospitals, and for a supply of syringes and fresh serum to the latter.

Tetanus developed in serious form in six cases: one during 1915, which proved fatal, and the remainder during 1916, one of whom died. No cases developed afterwards, which speaks well for the efficacy of prophylactic treatment when systematically given over a period of some weeks. The 1915 case was seriously ill otherwise, and succumbed almost immediately, but the other case died in a fashion terrible to behold; a sight which I never wish to see again.

Gas Gangrene.—Another terrible complication of wounds was gas gangrene, which made its appearance in 1916, but ceased during 1917. The nursing of these cases was very trying, the stench, in spite of fumigation, being impossible to control. Amputation, excision, and deep incision were the only remedies. It was very fatal, and we lost nine patients out of over 100 who suffered severely from this complication. Its cause was obscure, and many theories were advanced to explain its origin. It apparently was due to a mixed strain of germs, which became very destructive under certain conditions, causing the rapid evolution of gases.

Plaster Pylons.—In October, 1918, the hospital was one of those selected as a centre for the manufacture and supply of plaster pylons—a provisional apparatus for early use after amputation of the leg. The idea was to enable the patient to be up and about at the earliest possible moment, even before the wound was properly healed, to prevent the

development of the crutch habit, to enable the patient to more quickly regain his balance and confidence when in an upright posture, to lessen the chances of muscular atrophy in the stump, and generally to shorten the interval before a more permanent limb could be fitted at Roehampton Hospital and used with advantage. One of the medical officers and an orderly attended the Pavilion Hospital, Brighton, for instruction, and preparations were well in hand when the Armistice was signed. In the meantime, temporary legs were supplied through the kindness of the Sutton War Supply Depot.

Electro-therapy, Massage, and Bacteriology.—The electro-therapeutic department and massage corps were indispensable adjuncts to the work of the surgeons, so also was the bacteriologist, not only in checking the results of treatment, but in the preparation of autogenous vaccines in septic cases and in the diagnosis of the different bacterial complications.

War Office Publications.—The surgeons and medical officers were much assisted by the following publications, issued for their guidance and instruction by the War Office:—

- “Memorandum on the Treatment of Injuries in War based on Experience of the Present Campaign.” 1915.
- “Memorandum on the Carrel-Dakin Treatment of Wounds.” Jan., 1917.
- “General Principles Guiding the Treatment of Wounds of War.” 1917.
- “Memorandum on Amputations and Amputation Stumps in Relation to the Fitting of Artificial Limbs.” July, 1918.

The Triumph of Surgery.—All honour be to the surgeons in the Great War wherever they were! whether they did their merciful work amidst the terrors of the battlefield or in the busy cities and sylvan retreats at home. Theirs was a real “man’s job,” demanding at all times skill, precision, accuracy, calmness, and fortitude. True to the great traditions of their science and art, they failed not humanity when its very existence was threatened amid the passions engendered by the strife of nations. Whatever was lost or won by the war, surgery undoubtedly triumphed and gained a stronger position for the reign of peace.

IV

DEPARTMENT OF MEDICINE

Staff.

Officers in charge of Medical Division and Chief Resident Physicians.

Major P. A. Peall, M.B. Lond., R.A.M.C. (until June 8th, 1917).
Major D. Barty King, M.D. Edin., M.R.C.P. Lond., R.A.M.C. (from June 9th, 1917), Assistant Physician, Royal Hospital for Chest Diseases.

Visiting Physicians.

- E. A. Cockayne, M.D. Oxon, M.R.C.P. Lond., Assistant Physician, Middlesex Hospital.
- H. E. Symes-Thompson, M.D. Camb., M.R.C.P. Lond., Physician, Great Northern Central Hospital.
- A. J. Whiting, M.D. Edin., M.R.C.P. Lond., Physician, Prince of Wales General Hospital.

THE chief resident physician had the assistance of the visiting physicians for the first two years of the war, each of whom did a tour of duty. They acted as consultants in difficult or doubtful cases.

The range of medicine which fell to the lot of the physicians was very comprehensive, as will be seen from Table IV. They were called upon to treat practically all the common systemic diseases, many of general infections, and nearly all the infective fevers, which had to be cared for until removed to an infectious hospital.

The main conditions treated, especially those which had a close relationship to the war, only need be recounted here.

Enteric Fever.—During 1915, a large number of cases of typhoid fever were admitted from Gallipoli, mainly convalescent, but many were still active or much debilitated and needed much attention. One case we were unable to save. I was much puzzled at first as to how the soldiers took the

infection, seeing that practically all had previously been inoculated with anti-typhoid vaccine. The reason was soon forthcoming, for the Pathologist found them all to be cases of paratyphoid, either A or B, and it was apparent that ordinary typhoid inoculation conveyed no immunity. As described in the pathological chapter, these cases gave rise to much work in the laboratory, for none could be disposed of until they had been pronounced free from infection for some considerable time. Later on in the war such cases could be sent to special convalescent depôts. In all we dealt with 367 cases.

Staff Inoculated with Triple Typhoid Vaccine.—An interesting question arose as to how best to protect the nursing staff from typhoid, owing to the large number of infected patients there were about the hospital. In September, 1915, I heard that Sir Almroth Wright, at St. Mary's Hospital, was using a triple vaccine which was said to convey immunity from typhoid and paratyphoid A and B, so I wrote to the Army Authorities asking their opinion of it. I received a reply that investigations were being made, and that the result would be communicated in due course; in the meantime, on my own responsibility, I could use paratyphoid vaccine and make my own arrangements for obtaining it. I managed to obtain a supply from the Royal Army Medical College, and Dr. Foster, the M.O. in charge of staff, inoculated forty-eight members of the nursing staff with it. It proved quite safe and produced no untoward symptoms. Subsequently I sent the results to the Officer in charge of the Vaccine Department, Royal Army Medical College, who thought the report I sent valuable and thanked me for it. In January, 1916, inoculation with triple vaccine became the practice in the Army.

Dysentery.—During 1915 and 1916, we admitted a large number of dysentery cases from the East, some of whom proved very intractable to treatment, and several had to be disposed of while still infected. It is a painful and exhausting disorder and prone to recur in some form or other. We treated 444 cases before the hospital closed.

Malaria.—Soldiers suffering from malaria were constantly with us, the largest number being admitted in 1917. Later

the Army Authorities adopted very thorough measures to prevent the attacks recurring, but many men probably became life-long invalids from the disease. The constant exhibition of quinine, the only treatment of value, detracts from sound health, and Major Barty King formed the opinion that it impaired the resistance to influenzal pneumonia, chiefly by lowering the stability of the blood. Malaria also tends to impair the cardiac strength and has many complications.

Rheumatism and Myalgia.—As one would have expected, the severe weather conditions of the winter campaigns of 1915 and 1916 were productive of considerable rheumatism, and a most distressing condition of the muscles known as myalgia. Over 600 men were admitted suffering from more or less severe rheumatism and myalgia—398 during these campaigns, and it was most prevalent during 1916 and 1919, there being very few cases in 1915. The pathology of myalgia is obscure.

Neurasthenia.—No less than 905 cases were admitted for nervous diseases, mainly neurasthenia or neurasthenical in type. I was always very sorry for these men. Hyper-conscientious, and commonly more than usually intelligent, they felt themselves failures in the great struggle. They had a keen sense of duty, but nervous weaknesses outside their control engendered incapacity in conditions of great nervous stress and physical danger. Their souls were at the "front," their bodies said "home," and that was the pity of it.

Gastritis and Colitis.—Bully beef and army biscuit proved too much for the stomachs and colons of 1,621 of the admissions, in spite of training and hard muscular exercise. As a rule they did well excepting the cases of colitis, who will have a reminder of their soldiering days for many years to come. Most cases were associated with pyorrhœa and bad teeth.

Heart Affections.—Some of the most difficult cases to deal with were those soldiers returned home diagnosed as suffering from heart affections. It was not easy to separate out temporary and functional cases from those in which there was grave disease. D.A.H., which meant disordered

action of the heart, was frequently to be seen on the patient's bed card, some 652 patients being admitted with this condition as against 446 who had been diagnosed as suffering from V.D.H., or valvular disease of the heart.

The Military Aspect of Heart Disease.—The heart is a living pump which keeps the blood stream moving through a closed system of blood vessels. It has, therefore, to receive blood and afterwards to propel it onwards. Delicate valves regulate its mechanism, while the muscular walls supply the force. Either may be impaired or diseased, and the physician has largely been guided in his diagnosis by what he can hear through the stethoscope. From an army point of view, especially in times of war, it is immaterial what the nature of the cardiac lesion is; the main point is, will the heart do the work required of it? Or, in other words, will it bear the strain to which it might be subjected? The same question arose on discharge of a heart case from hospital as when an army recruit is examined. Experience soon taught us to trust more to the actual physical evidence of the work a heart could do rather than the text-book evidences of heart disease as commonly taught; and thus many a soldier fought for his country, and lives to fight again if need be, who would ordinarily have been rejected for life insurance. A memorandum drawn up by Sir James Mackenzie, at the request of the War Office, on "The Significance of Abnormal Signs in the Recruit's Heart," was very helpful in these cases. At no period in the history of medicine has so much light been thrown on cardiac function as during this war, and physicians have learned to look more at the practical and business side of the question than hitherto.

Cause of D.A.H.—Functional heart disease, as we saw it, was chiefly due to overstrain, nervous excitement, gastric troubles, and gas poisoning. Major Barty King instituted graduated exercises for these cases which were helpful towards recovery. Tobacco, I think, was too frequently blamed, and I have grave doubt whether tobacco, as usually used, can directly impair the heart. Any effects are probably secondary to the action on the stomach.

Trench Fever.—I now come to some conditions which seemed peculiarly associated with this war. Late in 1915,

and continuing throughout the war, a peculiar kind of fever arose, accompanied by initial frontal headache, general pains, pain in the back, and especially by pain down the front of the shin. Sometimes spots appeared on the chest and abdomen, and the spleen enlarged. It was found that there were three main types; one lasting a little over a week, and often followed by a short relapse before recovery, another showing prolonged initial fever, and another, which commenced much in the same fashion but ran a course consisting of numerous attacks with short remissions, and continued for weeks, even months. This latter type suggested the clinical picture of tuberculosis, and formed the greater part of the active cases we saw here, the others being largely convalescent on admission. It was early classified as P.U.O.—pyrexia of unknown origin—but, on definite clinical types being separated out, it came to be known as "trench fever." The cause has not yet been ascertained, but it is undoubtedly an infection and spread by the bite of the louse. No less than 1,066 cases were dealt with, the severest outbreak being during the first four months of 1918.

Trench Nephritis—Types.—Trench nephritis, which accounted for over 700 admissions, was another condition which puzzled the doctors a good deal, and seemed to be a war disease. It presented the clinical symptoms of nephritis, or inflammation of the kidneys, of varying degrees of intensity, assumed epidemic proportions at times, and did not always run the ordinary course. Many cases, though acute, were of short duration, and, to all appearances, recovered completely, but time alone will show the real extent of kidney damage this condition has occasioned. Albuminuria usually persisted for some weeks, often for months, and when recovered from would return if the patient was not careful to avoid alcohol, or was exposed to cold or heavy muscular exertion.

Cause.—There was much speculation as to the cause of this condition. It affected English troops more than French, and was most prevalent on the western front. Officers did not suffer in proportion so much as other ranks. No definite conclusion has yet been reached, but undoubtedly prolonged exposure, coupled with severe exertion associated with but

little rest or sleep, were important factors. Tinned food, poison gases, and a variety of germs, each had their advocates.

Colonel W. Hunter, A.M.S., Consulting Physician to the Eastern Command, was much interested in these cases and their future health, and on one of his visits in September, 1917, asked me to get out some particulars as to what they became fit for on discharge from hospital. I was quite in agreement with him that it was much better to retain them in the army on employments to ensure that they received regular diet, medical supervision, and restrained as regards the abuse of alcohol.

At one time all cases of nephritis were at the earliest moment discharged from the army, but in December, 1917, an Army Council Instruction ordered that such cases when free from albuminuria for twenty-one days, and on full diet, were to be retained in the army, and even return abroad. If not clear of nephritic symptoms at the end of five months they were to be discharged from the army.

Gas Poisoning.—The physicians were early called upon to treat the effects of gas poisoning. Admissions from this cause alone commenced in 1915, but it was not until 1917 that there was any great arrival of patients who had in this manner become victims to the enemy's enterprise. Undoubtedly the mortality at first was heavy, and cases did not live to reach this country. The years 1917 and 1918 were the gas-warfare years as far as we were concerned, nearly all the 1207 cases being admitted during this period. Devilish ingenuity was displayed by the Germans in conducting this mode of warfare. The gases were selected to damage the lungs, the nose, the eyes, or the skin, and used either singly or arranged to take effect in combinations. Our cases were mainly those caused by phosgene, one of the severest of respiratory irritants in existence, and there were a good number who suffered from what was commonly termed "mustard" gas.

Considered generally, gas cases presented either a variety of poison symptoms in mild form, or had suffered chiefly as regards the heart and lungs, or externally as regards the eyes and skin. The convalescent stage was the most difficult to treat successfully, especially the sequelæ of cardiac and nervous weakness.

We found early that prolonged bed treatment was a mistake, and in spite of protests from the patients they were got up and made to exercise at the soonest possible moment—after seven days rest in bed as a rule. Graduated exercise and country walks proved most useful, but many cases, nevertheless, were long and intractable in character, and the physicians had to proceed slowly and warily to avoid relapses. It will take years before some of these cases will be restored to full health, and others will never be but semi-invalids. Death occurred in four cases only.

A "Memorandum on Gas Poisoning in Warfare" was issued in July, 1916, for the guidance of medical officers, and again in April, 1918, the latter being a most interesting and valuable document.

Influenza.—Some of the heaviest work on the medical side was caused by the appearance of influenza, especially the severe epidemic which raged in late 1918, and early 1919. It was so closely associated with broncho-pneumonia that I include the latter in the following table, which shows the annual admissions for both diseases.

Annual Admissions for Influenza and Pneumonia.

	1915	1916	1917	1918	1919	Total
Influenza	207	251	206	845	685	2,194
Pneumonia	23	72	52	49	61	257

Annual Deaths from Influenza and Pneumonia.

	1915	1916	1917	1918	1919	Total
Influenza	—	—	—	6	4	10
Pneumonia	2	7	3	33	16	61

It will be seen that the considerable pneumonia which occurred in 1918, and 1919, was largely influenzal in origin, having regard to the well established fatality of influenzal pneumonia.

An analysis of the influenza cases as regards the place of origin of infection yields the following results:—

Admissions for Influenza.

	1915	1916	1917	1918	1919
From overseas	188	189	96	241	526
From United Kingdom	19	62	110	604	157

During 1915 the cases mostly arrived in September from the Mediterranean, and a few from France came in November. In the winter of 1916 an epidemic which commenced about the same time at home and in France continued until April of 1917. It was not very severe, and most of the home cases admitted here came from Woodcote Convalescent Hospital. There was a recurrence in a severer form from June to August, 1918, both at home and abroad, the home cases came chiefly from the Eastern Command Labour Centre, Sutton.

It was not until September of the same year that we saw influenza of the most virulent type, which appeared suddenly and quite unexpectedly among a number of malaria patients a few days after admission from Salonica. In October United Kingdom cases began to stream in from the Eastern Command Labour Centre, Sutton, and a few from Woodcote—175 in October, followed by 71 in November. They practically ceased during December and January of 1919, but commenced again in February, and ended to all intents and purposes in May, adding another 147 to these numbers.

The 1918 influx of influenza from abroad, apart from the incidence in September, commenced a little later, November being the heaviest month with 176 cases, which were followed by 97 cases in December. The figures for 1919 were: January, 121; February, 157; March, 132; April, 49; May, 30; when the epidemic died away. All the 1918 and 1919 cases were infected in France, except one batch of 53 cases in February, 1919, which came from Salonica. Some of the 1918 cases, too, originally came from the East, but were infected in France on the journey to England.

The Staff and Influenza.—The staff suffered very little from the various influenza invasions, perhaps owing to the precautions they were instructed to take, until a month after the more virulent form made its appearance in the hospital in September, 1918, and from October onwards until the end of March, 1919, the female staff especially suffered with increasing severity, a fatal result occurring in the cases of two nurses, a housemaid and one of the women helpers on the farm. A chaplain also died from the same cause.

It is not necessary for me to describe the ugly clinical features which characterised the never-to-be-forgotten epidemic of 1918 and 1919. The earlier epidemic in the summer was only moderately severe as regards symptoms, which were mainly naso-pharyngeal in type, and due to no special organism, and all the cases did well.

Malaria Convoy Suffers Heavily from Influenza.—The convoy of malarial cases which commenced our real troubles as regards influenza—one of 150 patients—was received ex-steamship *Gloucester Castle*, from Havre, on 16th September, 1918. The soldiers were all very cheerful on arrival, glad to be back from Salonica, and looking forward to an early discharge to their homes. None needed any special medical attention. Two or three days later several of them were seriously ill with severe broncho-pneumonia. On 21st September the first death occurred, and by 22nd September no less than 60, which rose to 70 by 24th September, and ultimately 98, were fighting for their lives, mostly being in the throes of broncho-pneumonia, admittedly the most severe the physicians had ever seen. It was an appalling sight, especially in one ward, to see the rows of cyanosed men struggling for breath. Huge quantities of oxygen were used, and the district scoured for supplies, but a large number died in spite of all that medical science and skilled nursing could do. Before the nature of the outbreak was recognised, these cases had come in contact with 188 other patients, of whom 17 developed severe influenzal pneumonia, with, in several instances, the same tragic result. All the wards which had admitted influenza were placed in quarantine until 5th October. Commencing in that month, definite wards had to be allotted to influenza cases, which were placed out of bounds, the patients, as they recovered, being given a separate garden for outdoor exercise.

The subsequent cases were not so severe as those which occurred in the malaria group in September, but they were quite serious enough for some to have an unhappy termination. Not less than 2,500 cases of influenza were treated since the opening of the hospital, and probably this understates the number.

The results of treatment, having regard to the severity of the symptoms and the dangerous complications, were very

satisfactory, and great praise is due to Major Barty King and the nursing staff for their heroic work. Oxygen and stophanthus helped to save many lives when boldly given and not delayed. Quinine, phenacetin, and aspirin were avoided as much as possible, for it was thought that the fatalities in September, 1918, were due, not only to impaired heart muscle from malaria, but also to having been saturated with quinine over long periods.

Tribute to the Doctors and Nurses.—It was a severe strain, mentally and physically, on both doctors and nurses, and splendidly did they face their responsibilities, and deservedly earned the admiration and gratitude of their patients, so freely expressed.

I have already severely taxed the space at my disposal in describing the work of this department. The chief resident physician visited everywhere in the hospital, for many of the surgical cases had complications for which his advice was necessary. He also had charge of the detention hospital for mental and infectious cases.

Scabies.—A large number of cases of scabies were treated from surrounding depôts and camps, sulphur baths and inunction giving the best results.

Notifiable and other Infectious Diseases.—I will conclude by giving a table of notifiable infectious diseases which were either diagnosed on admission or developed so on afterwards, and in some cases arose from being infected after being in hospital some time. It was remarkable how little infectious disease spread in the hospital, considering that it was constantly receiving almost every kind of notifiable disease. The outbreak of measles and German measles, in the spring of 1917, which affected both patients and nursing staff, was the only exception. This comparative immunity we owe to the extensive use of turpentine and its cheaper substitute in the cleaning of floors, and to the fact that I encouraged, as much as possible, the hospital being cleared of patients in the afternoons, allowing a complete and thorough "blow-through" of fresh air, which is an all important factor in the prevention of infection in hospitals.

Incidence of some of the Notifiable Infectious Diseases.

	1915.		1916.		1917.		1918.		1919.		Totals.	
	Pat.	Staff.	Pat.	Staff.	Pat.	Staff.	Pat.	Staff.	Pat.	Staff.	Pat.	Staff.
Scarlet-Fever	3	1	5	2	7	—	8	—	2	—	25	3
Measles	1	1	1	3	12	7	5	—	1	—	20	11
German Measles	—	—	—	—	13	20	1	—	—	—	14	20
Diphtheria	2	—	13	—	7	—	6	—	3	—	31	—
Mumps	—	—	—	—	4	—	3	—	4	—	11	—
Chicken-Pox	—	—	—	—	1	—	2	—	—	—	3	—
Cerebro-Spinal Fever	—	—	1	—	—	—	1	—	—	—	2	...
											106	34
											140	

Isolation Hospital, Bletchingley.—Most of these cases were transferred to an infectious hospital for isolation and treatment—the soldiers to the Isolation Hospital at Bletchingley, and the staff to M.A.B. Fever Hospitals and to Wimbledon Isolation Hospital.

V

EYE DEPARTMENT

Visiting Ophthalmic Surgeons :—

Mr. Charles Higgins, F.R.C.S., Consulting Ophthalmic Surgeon, Guy's Hospital.

Mr. W. Adams Frost, F.R.C.S. (until 12th July, 1918), Consulting Ophthalmic Surgeon, St. George's Hospital.

Resident Ophthalmologists :—

Captain J. H. Mason, M.B. Vict., R.A.M.C. (until 28th February, 1919), late Assistant Surgeon, Royal Ear and Eye Hospital, Bradford.

Captain J. McHoul, F.R.C.S. Edin., R.A.M.C. (from 27th February, 1919), Refraction Officer, Royal Eye Hospital.

A Primary Ophthalmic Department.—The work in the eye department was undertaken at first solely by the visiting ophthalmic surgeons until the hospital became an ophthalmic centre in February, 1916, when Captain Mason was posted as Resident Ophthalmologist, and also a R.A.M.C. optician. Mr. Higgins early identified himself with orbital injuries, and his work in this respect was soon so much appreciated that in March, 1917, the hospital officially became a primary ophthalmic department and the Eastern Command centre for the supply of artificial eyes, while for some months previously cases had been sent here specially for this purpose (24/Appliances/67 (A.M.D.3), 13th March, 1917).

From the first considerable difficulty was experienced in obtaining artificial eyes, for in many cases the orbits had suffered so much that specially made eyes were required. Apparently Germany, in peace times, had almost a monopoly of this trade, and there were few reliable eye artisans in this country. It was another example of our unpreparedness for war and German trade encroachment.

Special Eyes Manufactured.—The position became so serious, as regards the supply of special eyes, in August, 1917, that, at Mr. Higgins' suggestion, I put forward to the War Office a scheme for establishing a special eye workshop here, which received prompt approval (24 Gen. No./5906 (A.M.D.3), 25th August, 1917), and in December of the same year the manufacture of special eyes commenced. The workshop was a great saving in time and money and repaid its cost, but owing to the labour difficulties, its life, though useful, was short. The supply of ordinary artificial eyes was by War Office contract, but in March, 1917, the Army Spectacle Depot took over the work. It was not, however, until September, 1919, that it could undertake to make special eyes. In the meantime our workshop had been dismantled and the plant transferred there.

The work of this department became so extensive that it was necessary to provide additional accommodation, especially for out-patients. A neighbouring dormitory was enclosed and divided into an eye-sight testing room and a waiting room. These were suitably equipped and taken into use in June, 1918.

Mr. Higgins' Splendid Work.—Mr. Higgins' orbital surgery was wonderful. His skill and patience overcame all difficulties, and there were few cases in which the structural alterations were too severe for him to be successful in re-establishing a useful orbit. Mr. Adams Frost reserved himself chiefly to deal with difficult refraction cases.

Captain Mason, and later Captain McHoul, successfully administered the department and did considerable general operative eye work.

Summary of Work.

1. Major Eye Operations :—

Plastic operations on face and orbit	...	...	769
Other eye operations	...	...	161
			930

(The minor eye operations were too numerous to record.)

2. Artificial eyes supplied (from 1916) —

1916	...	...	...	395
1917	...	...	...	953
1918	...	...	...	1,001
1919 (to October)	...	...	...	315
Total				2,664

3. Refraction cases examined :—

1916	...	...	...	745
1917	...	...	...	1,665
1918	...	...	...	1,825
1919	...	...	...	909
Total				5,144

4. Spectacles supplied (excluding Colonials) :—

1916	...	...	...	209
1917	...	...	...	519
1918	...	...	...	632
1919	...	...	...	221
Total				1,581

5. Total patients examined :—

1916	...	...	...	4,100
1917	...	...	...	8,442
1918	...	...	...	8,849
1919	...	...	...	3,198
Total				24,589

Great credit is due to this department for the results achieved. The work done as regards artificial eyes was very valuable to the community, as may be imagined when one considers how much better off a man is in civil life whose appearance is not disfigured by an absent eye, or the black patch, not infrequently met with after previous wars.

VI

EAR, NOSE AND THROAT DEPARTMENT

Visiting Aural Surgeons.

Capt. G. H. Lawson Whale, M.D., F.R.C.S. Eng., R.A.M.C. (T) (until Jan. 1916), Surgeon (Ear, Nose and Throat), London Temperance Hospital, and Hampstead General Hospital
Mr. H. Buckland Jones, M.B. Edin. (from Jan. 1916, to Feb. 1918), Surgeon, Metropolitan Ear, Nose and Throat Hospital

Resident Aural Surgeon.

Capt. P. Ferguson, F.R.C.S. Eng., R.A.M.C. (from 9th Feb., 1918, to 27th Jan., 1919).

DR. J. C. POTTER visited for a few weeks in January, 1916, but his heavy work elsewhere took up too much of his time, so he resigned his post here.

The aural ward was for some months in charge of Captain W. B. Peacock, who was followed by two American aural specialists in succession : Lieut. M. F. Arbuckle, M.O.R.C., U.S.A., of Washington University Medical School, and Lieut. M. B. Coffman, M.O.R.C., U.S.A., of Chicago.

On a resident aural surgeon being posted, Mr. Buckland Jones was released for other work.

The work of this department was extensive, especially as regards ear conditions. A considerable number of the soldiers had chronic suppuration of the middle ear, contracted during childhood, which had very largely become quiescent, until roused into activity again by the exposure to hard weather and adverse conditions generally in the trenches. In many cases it was not sufficiently severe to incapacitate the soldier from duty, but it was an unhealthy and annoying condition, and opportunity was taken to alleviate the condition while the patient was necessarily

detained in hospital from other causes. The condition is always a source of danger, and may light up at any time and have a fatal termination from cerebral infection.

Eastern Command Otorrhœa and Mastoid Centre.—The centre for the treatment of severe mastoid disease and suppurative otitis (middle ear disease) for the Eastern Command, formerly at Croydon General Hospital, was transferred here on 19th July, 1916, and the hospital then became a very busy aural centre indeed.

In-Patients.—The annual admissions for diseases of the ear, nose, and throat were :—

1915	1916	1917	1918	1919	Total
141	437	544	495	283	1,900

but this by no means represents the work of the department ; many of the cases admitted for other reasons were found to be suffering from ear, nose, and throat conditions which needed treatment, and there was a fair sprinkling of general debility and inanition from these causes only.

Out-Patients.—There was also an abundance of out-patients from Woodcote Convalescent Hospital, the Manor War Hospital, and Eastern Command Labour Centre and training camps and units situated within a wide radius of the hospital. A large number of soldiers generally had either enlarged tonsils, nasal blockage, or chronic ear discharge, which resulted in such frequent appearances at the "morning sick" parade that some expert treatment became the only alternative to invaliding.

Summary of Work.—Numerous radical cures for mastoid disease, tonsilectomies, submucous resections, removal of polypi, reparative operations after injury, etc., were successfully undertaken, except in a few cases of mastoiditis with cerebral infection, which proved fatal in spite of all that surgery could do. The number of major operations performed by the aural surgeons was as follows:—

1915	1916	1917	1918	1919	Total
90	194	281	145	76	786

The records of work done generally in this department

are not complete for the whole period, but the following is approximately correct:—

Cases specially admitted to the department	...	...	...	1,900
Cases treated from other wards	...	...	...	9,800
Out-patients	...	...	...	7,260
Total cases	...	...	...	18,960
Total number of examinations	...	...	...	40,000
Average daily number of in-patients under treatment...	...	...	...	200

Prevention of Man Wastage from Otorrhœa.—With Colonel A. Carless, A.M.S., Consulting Surgeon, Eastern Command, Captain P. Ferguson was engaged in work on the prevention of "man wastage from otorrhœa" in the army, so as to make it possible for men so suffering to continue to be efficient soldiers under all conditions.