# AWM4

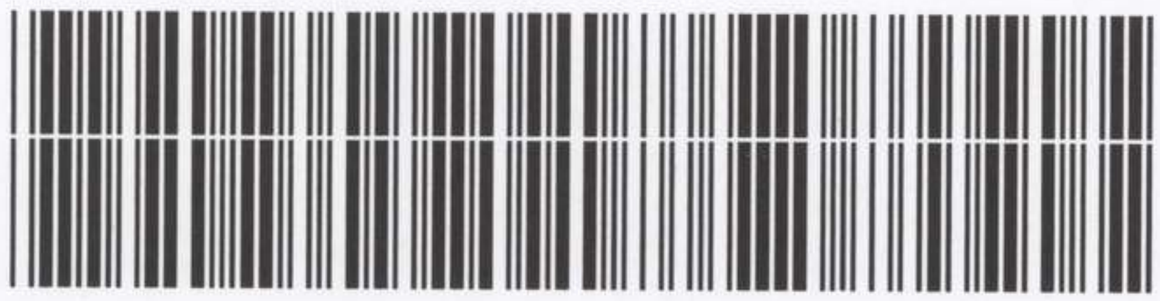
# Australian Imperial Force unit war diaries, 1914-18 War

Medical, Dental & Nursing

**Item number:** 26/73/15

**Title:** No 2 Australian Auxiliary Hospital, Southall

October 1918



AWM4-26/73/15

Instructions regarding War Diaries and Intelligence Summaries are contained in F. S. Regs., Part II. and the Staff Manual respectively. Title pages will be prepared in manuscript.

# WAR DIARY
*or*
# INTELLIGENCE SUMMARY.

(*Erase heading not required.*)

Army Form C. 2118.

466

| Place | Date | Hour | Summary of Events and Information | Remarks and references to Appendices |
|---|---|---|---|---|
| | Oct. | 1st. | Major Hardie M.C. and Capt Nisbet were granted leave for the purpose of sitting for an examination in Sanitary Sience at the University of Cambridge.<br>Mr. J.O. Fairfax ( Australian Press Representative) and Hon.Major H.de Vere Lamb( assistant Red Cross Commissioner) paid a visit to the hospital. | |
| | Oct. | 2nd. | Capt. A.Douglas ( Dental Corps) reported for duty with No.9. Dental Unit vice Capt Scholes being posted for duty with A.D.M.S. Tidworth.<br>A limb parade was held today:-<br>11 O.R. were passed as satisfactorily fitted.<br>4 O.R. were ordered artificial replacements (3 legs and 1 foot) | |
| | Oct. | 3rd. | Capt. L.R. Scholes left the unit today and reported for duty with A.D.M.S. Tidworth. | |
| | Oct. | 4th. | On Sep.28th.,last,notification was received from Major Gen.Sir N.R. Howse V.C. to the effect that Lt. Col. J. Gordon C.M.G. had been appointed a Member of the Advisory Council on artificial limbs during the absence of Sir Neville Howse V.C.( D.M.S. A.IF) on duty to Australia. | |
| | Oct. | 7th. | Major Vine ( Chaplain) left the Unit today en route to Australia.<br>Lt. Col. Buchanan left on 2½ months leave in accordance with the General Leave granted to members of the A.I.F. who left Australia in 1914 and who have not since returned to Australia for any reason. Lt. Col. Gordon assumed the duties of the Commanding Officer vice Lt. Col. A.L.Buchanan on leave. Major J.Hardie M.C. returned from Cambridge after sitting for an Examination in Sanitary Sience. | |
| | Oct. | 9th. | The usual Limb parade was held today:-<br>4 were passed as satisfactorily fitted.<br>7 were ordered artificial replacements.<br>Capt & Q.M. Aspinall L.J. was struck off the strength as from 8th. Inst.having been transferred to A.D.M.S. Tidworth for duty. | |
| | Oct. | 10th. | Capt Nisbet returned from Cambridge after sitting for an Examination in Sanitary Sience. | |

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466

| Place | Date | Hour | Summary of Events and Information | Remarks and references to Appendices |
|---|---|---|---|---|
| | Oct. | 13th. | Chaplain Capt. L.T. Maund reported for tempory duty today vice Chaplain Major Vine returned to Australia. | |
| | Oct. | 16th. | The usual limb parade was held today:-<br>2 Officers)<br>6 O.R. ) were passed as satisfactorily fitted.<br>1 pensioner)<br>1 man was ordered an artificial leg.<br>10 were ordered temporary peg legs. | |
| | Oct. | 17th. | A death from sepsis, secondary Haemorrhage supervening on a gun shot wound in the neck, occurred today. The patient being No.3610 Pte Brentnall James 44th. Bn. Authority was given by H.Q. A.I.F. that the next of kin who was resident in England, might have a private burial. The remains of this soldier was accordingly removed by motor Ambulance to Charing Gross, where it was handed over to the A.I.F. Head Quarters official for transport to Bromley.Kent. | |
| | Oct | 23rd. | The weekly limb parade was held today:-<br>3 O.R. were passed as satisfactorily fitted.<br>2 do were ordered artificial limbs<br>9 do were ordered temporary peg legs. | |
| | Oct. | 25th. | No.2044 Pte Buckland B.J. 46th. Bn. died today at9.A.M. from pneumonia. Arrangements were made some time ago for special leave to be granted to one of his brothers who arrived from France in ample time to be present at his death. Another brother who was a patient in a British hospital in England was also persent. His brothers and relatives in England request a private burial and accordingly arrangements are being made for same. | |
| | Oct. | 26th. | Capt. E. J. Thompson M.C. reported for duty today . Chaplain Capt. L.T. Maund relinquished temporary duty and was replaced by Chaplain Capt Deasey. | |
| | Oct. | 28th. | Capt. Biggs reported for temporary duty ex D.M.S. H.Q. | |
| | Oct. | 29th. | The Remains of the late Pte Buckland left the hospital today at 3.P.M.for interment in Isleworth Cemetery where an A.I.F. firing party will meet the deceased soldier and he will be buried in relatives grave. | |

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# WAR DIARY
*or*
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Army Form C. 2118.

466

| Place | Date | Hour | Summary of Events and Information | Remarks and references to Appendices |
|---|---|---|---|---|
| Southall | Oct. | 29 | Capt. James A.A.M.C. was granted leave until 11.11.18 by D.M.S. | |
| | " | 30. | A Limb Parade was held to-day :-<br>5 other ranks were passed as satisfactorily fitted<br>3 do were ordered Ernst Limbs<br>7 do were ordered temporary Peg legs | |
| | | 31. | Capt. Biggs relinquished temporary duty and reported to Headquarters for further Orders<br><br>The total number of artificial limbs passed as satisfactory and fitted to patients is as follows :-<br>Essential 6, Ernst 20, Allen & Hanbury 3, Masters 1, Hobbs 2 - Total 32. | |
| | | | Total admissions 114, - Discharges 168. | |
| | | | Average Daily sick 514. | |

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4

# WAR DIARY

OF

No. 2 Australian Auxiliary Hospital. SOUTHALL.

FOR

October 1918. 191

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## LIST OF APPENDICES.

| No. | Subject. |
|---|---|
| A. | Report for month by Lt. Col. J. GORDON. O.C. |
| B. | Report by M.O. i/c Surgical Wards. |
| C. | Report by Radiographer and Massage Dept. |
| D. | Report by the Surgeon i/c Theatre. |
| E. | Report by the Matron on months work. |
| F. | Report by the N.C.O. i/c Amusements. |
| G. | Report by Major Lethbridge M.B.E. on a visit to Orthopaedic Hospitals in Italy. |

466

War Diary 'A'

November 2nd, 1918.

To the D.M.S., A.I.F.,
Administrative Headquarters,
130, Horseferry Rd.,
LONDON.S.W.1.

I have the honour to submit the following report for the month of October:-

1. COMMAND.
I took over command of the Unit on 7th October vice Lt. Col. Buchanan who proceeded on 75 days' leave.

2. DISCIPLINE.
This continues to be good.

3. Q.M. DEPARTMENT.
The work in this Department has been entirely satisfactory. Hon. Lieut. & Quartermaster Mc.Call took over vice Hon. Capt. & Quartermaster Aspinall transferred to A.I.F. Depots in U.K. A Stock-taking was completed as at the 30.9.18. List of Deficiencies, etc. disclosed was placed before a Board of Officers and proceedings forwarded to D.M.S.

4. CONSTRUCTIONAL WORK.
The construction of Latrines at the Schools has been completed but the bath-rooms and hot-water service has been delayed through non-delivery of Boiler and Cylinder; these are expected daily.
The renovation of the whole of the exterior of the Main Building is in progress. This is being done by Contractor on account of the St. Marylebone Guardians.
The concreting of the covered way to the Schools has been completed, and sundry repairs to the tar pavings at the continuation of the covered way are still in progress.
Nine R.E. service men have been detached from temporary duty and have reported back to Hounslow, three remaining for sundry repairs and new work.
A shed to hold the chairs for the double amputation patients has been completed at the rear of H.I.J Wards.

5. RED CROSS WORKSHOPS.
These are being made full use of by the limbless patients who attend regularly and show great keenness for learning their respective trades. Hon. Capt. Peebles has left for duty Overseas and his place has been temporarily filled by Hon. Capt. Payne who reported on 22nd October.

6. V.A.Ds.
The work of this organisation continues to be satisfactory. There are a total of 53 at present attached which includes one Commandant, one Superintendent and 51 other ranks. I would point out the urgent necessity for Hospital accommodation for V.A.Ds. as the present arrangements are most unsatisfactory. I have been in communication

with O.C. Civilian Staff, Administrative Headquarters, with reference to this matter. Great difficulty was experienced in combating with the prevailing epidemic of Influenza, 25% of this section of the Staff having been attacked, including the Commandant. The necessity arose for setting apart two rooms at "The Romans" for the treatment of these cases, which I personally inspected and approved of.

7. GENERAL HEALTH.

Two deaths occurred amongst the patients as follows:-

1. 3610 Pte. Brentnall J., 44th Bn. from Sepsis, secondary haemorrhage supervening on a gun shot wound in the neck.
2. 2044 Pte. Buckland B.J., 46th Bn. from pneumonia.

Both these soldiers were buried in private graves, satisfactory arrangements being made by relations in conjunction with Headquarters.

A few cases of Influenza in a mild form were reported amongst the patients and Staff but the epidemic was most marked amongst the female members of the Staff.

8. AGRICULTURE.

The harvesting of the potato crop is nearing completion; already 15 tons have been stored for Hospital use and it is expected that another ton will be raised, making a total of 16 tons.

9. OFFICERS.

Several changes have occurred during the month as follows:-

Struck off:

| | | |
|---|---|---|
| Lt. Col. Buchanan | 7.10.18 | to 75 days' leave. |
| Chaplain Major Vine | 7.10.18 | to Australia |
| Capt. Scholes (Dental) | 3.10.18 | to Tidworth. |
| Chaplain Capt. Maund | 26.10.18 | to Headquarters |
| Capt. James | 29.10.18 | to sick leave. |

Taken on:

| | | |
|---|---|---|
| Chaplain Capt. L. T. Maund | 13.10.18 | from Headquarters |
| Chaplain Capt. Deasey | 26.10.18 | from Headquarters |
| Capt. E. G. Thompson M.C. | 26.10.18 | from Headquarters |
| Capt. Biggs | 28.10.18 | from Headquarters. |

10. ATTACHED.

Returns are attached by the Surgeon, Officers in charge of Special Departments and the Matron giving synopsis of their work.

Gordon

---------- Lt. Col.

O.C. NO. 2. A.A.H. SOUTHALL.

B

7

MONTHLY REPORT OF MEDICAL OFFICERS.

Month ending 31/10/18. Wards A. H. I. and J.

MEDICAL.
(1). Admissions ..... 8 .....
(2). Discharges ..... 5 .....
(3). Transfers ..... 11 .....
(4). Limbs fitted .....
(5). Now cases sent to Massage ..... 6 .....
(6). Operations.
Major. .....
Minor. .....
(7). X.Ray Examinations ..... 15 .....
(8). Condition on arrival after travelling ..... good .....

NURSING.
(1). Changes in Staff..... Sister. Kennedy left for Dartford and Sister. Buchanan took over. H.I. and J. Wards .....

ORDERLIES.
(1). Discipline. Quality of work.... good .....
(a). Male..... good ..... .....
(b). Female... good ..... .....
(2). Remarks.
.....

PATIENTS.
(1). Discipline ..... good .....
(2). Average stay ..... 6 months .....
(3). Work done by ..... very little .....
(4). Remarks. .....
.....

RED CROSS ,A.N.A. etc.
(1). Supply of comforts..... good .....
(2). Outings Concerts etc..... fair .....
.....

FOOD.
(1). Quality..... good .....(2). Quantity.... good .....
(3). Variety..... good .....

R.E.SERVICES. Improvements.
(1). Carried out..... Shed for chairs H.I. & J. Wards
(2). Suggested.....
(3). Remarks.....

ADDENDA. The following are attached:-
(1). ~~Reports of Unusual Cases.~~
(2). ~~---do------~~ All serious illnesses and deaths.
(3). ~~---do------~~ Medical Interest.
( strike out any not attached ).

Handé ..... M.O. in Charge.

31.10.18 ..... Date submitted.

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C

466

No. 2 Australian Auxiliary Hospital,
SOUTHALL.
November 4th 1918.

From. Captain Nisbet. A.A.M.C.

To. O.C.

X. Ray and Massage. Report for the month of October.

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The number of X. Ray cases shows a marked drop due to very few admissions to Hospital during the month.

Sgt. Priestley left during the month to join X. Ray dept at the Australian Hospital Tetbury. This N.C.O. , during his 18 months work here has been invaluable and his care and attention to his work cannot be too highly praised.

In the Massage Dept; although the number of cases is up to the average and the type of case has been the same throughout the month, namely, amputation stumps flexed at the hip joint.

Attached are figures:-

MASSAGE.

| | |
|---|---|
| Total Number of Patients | 89. |
| Average Daily attendance. | 44. |
| Treatments completed. | 19. |
| Total number of treatments | 1346. |

X. Ray Statistics for OCTOBER 1918.

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| | | |
|---|---|---|
| No. of patients | 97 | |
| No. of Limb cases | 89. | |
| No. of Plates. | 148. | |

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| | | |
|---|---|---|
| Shoulders | Nil. | |
| Hips. | 1. | |
| Heads , necks, and teeth, | 5. | |
| Backs. | 0. | |
| Chests. | 1. | |
| Localisation on Skin. | 1. | |
| Treatment. | 0. | 8. |
| Lower Limbs. | 80. | |
| Upper. Limbs. | 9. | 89. |
| | Total. | 97. |

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A.A. Nisbet ..... Captain. A.A.M.C.
Radiographer. No. 2 A.A.H.
SOUTHALL.

466

D

8

From: Major Hardie

To: O.C.
No. 2 Australian Auxiliary Hospital
Southall.

REPORT ON SURGICAL WORK FOR OCTOBER

I beg to forward you hereunder a list of the operations performed by me during the month of October.

The operations were of the usual character and the small numbers, compared to previous months, was due to the fact that a large number of Patients are awaiting embarkation to Australia and the admission of new cases has therefore been unavoidably delayed.

A change was made in the Nursing Staff, Sister Coombes, (transferred to Dartford) having been replaced by Sister Durham.

LIST OF OPERATIONS

| | |
|---|---|
| Re-amputations | 4 |
| Scars | 13 |
| Sequestrectomy | 5 |
| Foreign bodies | 1 |
| Hernia | 3 |
| Haemorrhoids | 2 |
| Osteotomy | 1 |
| Dilation of Anus | 1 |
| Neurectomy | 2 |
| | 32 |

.....Hardie Major

9

466

E

No. 2 Australian Auxiliary Hospital
Southall
31st October. 1918.

From: No. 106 Sgt. A.T. Cornish

To: O.C.
No. 2 Australian Auxiliary Hospital
Southall.

During the absence of the Permanent Padre, I beg to inform you that I carried out, in addition to my other duties the following arrangements in connection with the entertainment and amusement of the patients.

4 Outings to Windsor Castle
13 " to places of Amusements in London

In addition to the above the undermentioned were carried out at the Hospital:-

8 Cinema Shows
3 Pierott " by our own Staff
Daily Mail Concert Party
Oscar Asche Dramatic Company
Miss Marie Lloyd and a party of Artistes from Hammersmith Palace.

A.T. Cornish Sgt.

10

No. 2 Australian Auxiliary Hospital,
S O U T H A L L,
2nd November, 1918.

F

466

MATRON'S REPORT FOR OCTOBER, 1918.

WORK. The work of the Hospital has been much increased owing to the outbreak of Influenza - one death unfortunately resulting from Pneumonia following Influenza. The patient had previously been badly gassed.
One other death resulted from a wound in the neck.

HEALTH. The health of the Staff has suffered (and is still) from the prevailing outbreak. Four are away in Southwell Gardens.

CHANGES. This month have been many. Miss Miles Walker and a member of her Staff arrived from Dieppe on the 5th, and left again on the 18th for Sutton Veny to assist in nursing a virulent outbreak of Influenza.
It is with the sincerest regret that we learned of the death of Miss Miles Walker from the same disease on the night of the 30th.
Miss Quarterman of No. S.T.S. and five more Staff went to Hurdcott also on the 18th to combat influenza at No. 2 Group Clearing Hospital. Miss Quarterman lies dangerously ill there.
Miss Tucker, our most valuable and amiable Head Sister left on the 26th to take charge of the A.F.C. Hospital at Tetbury. She had endeared herself to everyone and is greatly missed.
Other changes include the going and coming of No. 1 and No. 6 S.T.Sections, and S/Nurse Lenton to France, who has been replaced by S/Nurse Hammersley.
H.S. Pratt is doing duty at H.Q.

IMPROVEMENTS. One of the two sitting rooms in the middle cottage has been transferred to No. 1 Cottage. This was done so that the Sisters might not miss so much the fires in their bedrooms.

MESS. The promised increase in the Mess Allowance is still not forthcoming. Sisters are providing themselves with necessary food from their pay, and it is with the greatest difficulty the Mess is kept out of debt.

Mary A. Farley ...Matron.

G.(1)

11

466

# APPENDIX TO A REPORT ON A VISIT TO ORTHOPAEDIC HOSPITALS IN ITALY

by

Major H.O. Lethbridge A.A.M.C.,

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After some nineteen month's experience at No. 2 Australian Auxiliary Hospital Southall and having visited several limb hospitals in England, France and Italy, one must necessarily have gained some experience and arrived at certain conclusions. Even yet however, certain problems are unsolved and one must be careful to avoid speaking dogmatically.

## LOWER LIMB AMPUTEES

It is now obvious to all that it is unwise to fit with a final limb before the stump has shrunk to its more or less permanent shape.

To avoid the disadvantages "moral" and"physical" which accrue from the lengthy use of crutches, it therefore becomes necessary to use temporary replacements which must be worn from four to twelve months according to the time needed by the stump to become finally shrunk. A temporary replacement should satisfy the following conditions :-

1. It should be easily alterable to conform to the shape of the shrinking stump.
2. It should be cheap.
3. It should be quickly made in as large numbers as necessary.
4. It should be comfortable.
5. It should enable the wearer to walk with the gait that he should ultimately adopt with his final limb.
6. It should be light.

The question of material is not important provided that the material used will enable the replacement to be made satisfying the above conditions.

In some hospitals the amputé is first given a plaster replacement before fitting with his second temporary limb. In most cases this appears ~~mmk~~ unnecessary, but in certain types of stumps, for example the fat flabby thigh where rapid and marked shrinking is going to occur for the first three weeks of wearing a replacement, it is advisable.

A good method of making a temporary plaster appliance is as follows :-

Cut a piece of thick soft felt to fit the stump like a glove finger, open at the bottom. Fit this felt accurately to the stump with plaster bandages, incoporating the lateral metal supports in the process. This needs less plaster and gives a more comfortable and lighter replacement than is usually seen.

The routine adopted at present at this hospital isx as follows :-

The stump is healed before any type of replacement is ordered

## BELOW KNEE

Moist leather is moulded on to a cast of the stump, care being taken to avoid pressure on the head of the fibula. This bucket is laced behind and lateral jointed steels extend up to a thigh corset which prevents sliding of the stump in the bucket. Tuber bearing is only given in certain cases which cannot tolerate the pressure below the knee. This bucket is fixed below to a standard wooden support in the end of which is a socket which receives:-

1. A peg for ordinary use
2. A foot for aesthetic reasons.

This foot made of wood has a moderate degree only of ankle

movement. (For details see later)

In Symes amputations leather buckets lacing in front with a soft tongue to protect the shin are being used. A foot piece is givenwith the ankle bolt below the bearing surface, the other boot being raised slightly if necessary.

ABOVE KNEE

The same lateral steels and standard replaceable peg and foot are being used here. The shape of the leg is given by a cone of wood fibre which is light, durable and strong but rather difficult to mould nicely into shape. The amputè is encouraged to walk with knee movement but a lock is supplied which he uses when walking on uneven surfaces or when standing for any length of time.

The bucket is made low in adductor region and comes well up on the outside gripping the great trochanter. The tuber surface is well blocked out and flattened, care being taken to place this bearing surface on the correct portion of the bucket that is postero-internally not posteriorily and to avoid having it sloping from without inwards. This latter fault is not uncommon and results in a continual tendency of the limb to move out of place.

In many cases a pelvic band is supplied, the portion gripping the ilium on the amputated side is made of iron, the remainder being soft. An attempt is being made to support the limb as follows :-

The pelvic band with its hinged shank supports the bucket externally. Internally about 3 inches from the adductor edge of the bucket is a wooden roller. Around this passes a cord which is fixed to the pelvic band in front and behind, a little beyond the middle line. In very short thighs broad pelvic bands like corsets moulded in moist leather to fit the patient accurately are being used. These temporary limbs can be quickly and cheaply made are comfortable and the patients walk well in them. It is hoped that the amputès returning to Australia fitted with these limbs will be able to use them with comfort and success and accomodate them to their shrinking stumps until such time as they are fitted with their permanent limbs.

We do not encourage the use of stiff pegs for above knee amputès. They give to the wearer an ungainly and awkward gait which more than outweighs the stability gained by having no knee joint. The kneeling peg is abolished.

It will be seen from the above that an attempt is being made to give to the amputè a replacement which is far more than a simple pylon. In view of the fact that he will have to depend on this replacement for at least several months we regard this as advisable.

Moreover, the amputè fitted with a temporary replacement with knee and ankle movement is being trained to walk as he should do and to balance himself as he will afterwards have to.

The argument so commonly used that stability is the first essential is sound but the use of a knee lock immediately converts this limb into a pylon from the point of view of stability. The wearer of an unjointed above knee pylon has an ungainly walk and is an encumbrance to his friends because of his inability to do anything with his limb when sitting down beyond letting it aggressively stick out in front of him.

PERMANENT LOWER LIMBS

These should be delivered only when the stump is finally shrunk. They should be light, durable, comfortable stable and should produce in the wearer the best possible gait. To obtain the best results co-operation between the Surgeon and the Limb Maker is essential. The human element should never be overlooked in fitting and a type of replacement which suits one man may be quite

unsuitable for another ~~for~~ with an apparently similar stump.

MATERIAL. Provided that the final limb satisfies the conditions above mentioned the material used does not matter. Wood is probably the most commonly used, but has the following disadvantages:-

1. It is apt to crack
2. It is difficult to shape the bucket to an exact fit of the stump
3. Even when this accurate fit is achieved, the stump will probably alter in its size and shape from time to time according to the weather, the leanness or fatness of the amputè &c

LEATHER. This can be moulded into a more exact fit of the stump and has the advantage over wood that it can be laced to accomodate an altering stump. Its disadvantages are that it is rather heavy and hot.

METAL. Duralumin is at present being used and will probably be more so after the War when it will be more procurable. Steel which is still probably the strongest material for its size and weight will probably be more used as time goes on.

## THE FOOT

The rubber foot is heavy and not durable and is going out of use. Wooden foot pieces are the most common. There should be a tarso metatarsal joint formed preferably by a rubber buffer in a V wedge. The distance from this joint to the ankle joint should vary according to the height of the individual. If too long he will rise too high as he comes forward on his artificial limb. If too short the opposite will happen.

The foot is usually set with the toe pointing slightly outwards to copy the inclination of the foot in nature. At present I am of the opinion that it would be an advantage to avoid attempting to copy nature and to place the knee bolt and ankle bolt parallel and the foot at right angles to these bolts that is, pointing straight forward. There is a considerable variation of inclination from pidgeon-toe to a marked outward turn of the foot and it is probably better to neglect this in setting up the artificial limb.

## ANKLE JOINT

This is a most important part of the artificial limb and exercises considerable influence on the gait. The joints should be so arranged that when the boot is on the leg should stand at right angles to the ground. A slight range of forward movement about eight degrees should be allowed for by compression of a rubber buffer This buffer should be broad and not too easily compressed. Soft springs and small rubber buffers in this situation have the disadvants of decreasing stability and balance.

This degree of forward ankle movement whilst still maintaining stability allows sufficient flexion to enable the amputè to walk up a moderate incline and to carry his body beyond the perpendicular with the foot still resting on the ground as occurs in normal walking.

We had one case of a double amputation supplied in Australia with two rigid ankles who was unable to walk, and his inability to do so was mainly due to the fact that the rigid ankles prevented his overbalancing himself forward step by step.

Backward movement should be similarly given by compression of a rubber buffer and with a range of about fifteen degrees.

Insufficient check of backward movement results in the sole coming flat on the ground at the same as the heel causing a limping and unstable gait. In descending moderate inclines a slight degree of backward movement allows the sole to come in contact with the ground soon after the heel.

where steeper grades have to be negotiated the following alternatives are open :-

1. To give greater range of ankle movement.
This is unwise, as the decrease in stability which results more than outweighs any advantage gained.

2. To neglect the inclines which after all occur only occasionally in the daily routine of most limbless men.

3. To supply an arrangement (as is done in Milan) which by screwing a connecting rod in the pocket alters the set of the foot without disturbing the degree of ankle movement.
This in theory is excellent but practically it has yet to prove that it does not dexcrease the durability of the ankle joint.
Lateral ankle movement is unnecessary and unwise.

## BELOW KNEE LIMBS

We are here confronted with the much discussed question whether the weight should be taken (1) on the tuber (2) below knee (3) partly below and partly above. It is by no means easy to come to a conclusion on this point.

Theoretically the lower the bearing surface is put the greater the stability the better the equilibrium and the better should be, the gait. Practically however, one is confronted with the fact that it is difficult in many cases for the amputé to take all his weight below knee. The head of the fibula is a frequent source of trouble and Limb Makers endeavour to get over this difficulty by blocking out the bucket in this situation or by applying lateral steels which divide to encircle the head of the fibula.

Tight lacing of the thigh corset to take part of the weight is prone to cause oedema of the stump and atrophy of the thigh muscles. The below knee amputé will certainly be fitted easier with tuber bearing. As a rule the bearing should be taken below the knee and tolerance will come with lapse of time and careful fitting. Where the stump is very short or where the amputé is unable after a careful trial to tolerate the weight below the knee tuber bearing should be given. The type of limb which bears unsatisfactorily below the knee and compels the wearer to use a tightly laced thigh corset should be condemned. In short below the knee stumps a leather sock should be fitted over the end of the stump and fixed to the above knee portion to prevent the stump slipping out of the bucket in flexion.

## ABOVE KNEE LIMBS

The Knee problem. If one considers how often in the normal limb some or all of the body weight is supported with the knee flexed and that so far no satisfactory limb has been in use which allows the wearer to support his weight in this position, one at once realises the importance of this problem. In short thighs it is of supreme importance and in double thigh amputes the question of whether they will ever wear their limbs with any comfort or safety depends very largely on the satisfactory solution of this question. In walking up or down grades the absence of this power compels the thigh amputé to use his limb as a stiff peg. On uneven ground the thigh amputé is always conscious of the fact that if his artificial foot hits any obstacle as he brings it forward and his weight comes on the artificial leg with the knee flexed he must either fall or save himself by a dexterous hop forward on his sound leg. It is this dread of falling and ever present feeling of instability which prompts the thigh amputé so often to choose what he regards the lesser of two evils and to wear a pylon knowing that this would not give way and let him down. A brake which will solve this problem should satisfy the following conditions

1. It should be voluntary.
2. It should be potentially applicable in any degree of flexion and in any degree from complete arrest to slight retardation.

3. It should be actuable quickly and simply so that its application would become an involuntary habit like the contraction of the adductors of the experienced horseman. ~~For this was~~

The drum expanding brake automatically actuated by pressure on the toe "Crichtleys" and the break at present under construction by the Essential Limb Coy, while representing a great advance in the fitting of the above knee ampute are not ideal in that they do not satisfy condition 1 abovementioned.

## EXTENSION OF THE LEG

To secure stability and in order that the knee should not give way when the weight is put on an artificial limb it is necessary to set the knee bolt slightly behind the vertical axis of the limb, thus producing in the erect position a moderate degree of hyper-extension of the knee.

Some above knee limbs have no means of extending the leg on the thigh. The Amputé wearing such a type is condemned to a more or less leisurely gait and has to wait for the swing forward of the leg on the thigh which occurs like a pendulum and cannot be materially increased in speed.

Different types of extensors are in use. The spring extensor of which the most common type is a rod extending down from the knee bolt and slung in an elastic loop fixed to the inner side of the calf, is in vogue in many above knee limbs.

Flexion puts the elastic on the stretch and its recoil extends the leg. If this elastic is new and tight the extension is too rapid, and the patient either walks with a stiff knee or full extension is prone to occur before the thigh has passed the vertical, thus causing difficulty in clearing the ground. Moreover the degree of extension is fixed so that whether walking slowly or quickly extension occurs always at a rate dependant on the tension of the elastic. Again the elastic gradually stretches and this type tends to revert to that which is ~~minus~~ without any extension.

Another type is that in which an elastic band stretches from the front of the thigh to the front of the shin. This is an attempt to replace the quadriceps extensor, and has the same disadvantages that have been outlined in the previous type.

The so called American type is perhaps the best. In this, shoulder straps are fixed to cords which exert a levering action on an extension from the knee bolt to the calf. Although differing in detail, they are alike in principle, elevation of the shoulder with tension on the straps extending the leg. The Amputè is able by walking very erect and tightening his straps to bring about a rapid extension of the leg on the thigh when walking fast, whereas, if he wishes he may leave the straps looser and in leisurely walking depend on the pendulum swing only, Moreover he is able when the weight accidentally comes on the flexed knee to bear a fraction of his weight by means of this extension lever, and with practice to lessen his liability to fall. The practice of using these shoulder straps to support the limb on the stump and thus asking them to fulfil two different duties is wrong. The limb should be supported by a well fitting pelvic band and the shoulder straps left free to fulfil their sole duty of extension.

In above knee limbs the knee piece is usually the weak link in the chain of durability. Constant knocking caused by the arrest of extension, in the end, tends to bring about weakness of the knee joint and not uncommonly ~~fracture~~ of the wooden knee piece,

This arrest is brought about in different ways such as:-

1. Strap checks behind the joint
2. A U shaped groove in the knee piece which in full extension abuts against a vertical rod extending upwards from the leg.
3. A wooden balcony on the knee piece which arrests against the top of the knee piece.

None of these types are altogether satisfactory, and the wooden knee piece will sooner or later be replaced by one of metal as is already being done at Milan.

## THE THIGH BUCKET

The question of the shape of this bucket has already been dealt with in "temporary" limbs. The inner slip socket of lacing leather used by Messrs Allen & Hanbury is an attempt to solve the difficulty of obtaining intimate apposition of the bucket to the whole length of the stump, but has not yet proved its efficiency.

End bearing should always be given where tolerable.

## PELVIC BANDS

A well fitting pelvic band is the best form of attachment of an above knee limb to the body. It should grip the ilium below the crest and should be moulded to the shape of the body.

The shank should be curved to allow for the fact that the attachment to the bucket is exterior to the gripped portion of the ilium. Most pelvic bands have a hinged joint on the shank.

Perhaps a ball and socket joint, allowing circumduction would give more freedom without decreasing stability.

The Amputé should be trained and encouraged in the use of his artificial appliance, particularly in the first few weeks.

In the case of thigh Amputés, it is a good plan to make them use two walking sticks. This prevents the common habit of leaning away from the affected side, putting weight on one stick, and increasing the ever present abduction.

One cannot fail to realise how far short of the ideal we still are, and opinions given in this report are liable to be altered or abandoned as experience improves our ability to fit the Amputé better from month to month.