

Final report of the Inter-departmental Committee on the Rehabilitation of Persons Injured by Accidents.

Contributors

Great Britain. Inter-Departmental Committee on the Rehabilitation of Persons Injured by Accidents.

Great Britain. Home Office.

Great Britain. Ministry of Health.

Great Britain. Scottish Office.

Publication/Creation

London : H.M.S.O., 1939.

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Final Report of the
Inter-Departmental Committee
on the
Rehabilitation of Persons
Injured by Accidents

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The Interim Report of this Committee was published in June, 1937, price 4d., post free 5d. Obtainable from any of the addresses overleaf, or through any bookseller.

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TABLE OF CONTENTS

	Page
WARRANTS OF APPOINTMENT	v
CHAPTER I. INTRODUCTION... ..	1
CHAPTER II. THE SUBJECT OF THE INQUIRY	4
CHAPTER III. STATISTICAL ASPECTS OF THE SUBJECT OF THE INQUIRY	5
(i) Number of cases treated in hospital of (a) fractures; (b) other injuries by accident	5
(ii) Results of treatment	6
(iii) Geographical Distribution of cases	7
(iv) Distribution according to the circumstances of the cases	7
(v) Distribution of industrial cases according to industry	9
(vi) Financial aspect of the subject	9
Appendix A.—Statement of the number of new fracture cases and of new accident cases dealt with in 1935 in Hospitals in Great Britain	11
Appendix B.—Statement indicating the distribution by Counties of the cases referred to in Appendix A... ..	14
Analysis of Accidents resulting in fractures:—	
Appendix C.—In Factories and Workshops	17
Appendix D.—In Coal Mines	18
Appendix E.—On Railways	22
CHAPTER IV. SCOPE OF THE REPORT	23
CHAPTER V. THE CASE FOR ORGANISED FRACTURE SERVICES... ..	26
CHAPTER VI. THE ORGANISATION AND FUNCTIONS OF A FRACTURE DEPARTMENT	38
(a) Modern Developments in the Treatment of Fractures	38
(b) General Organisation of a Fracture Department	41
(c) Routine of Fracture Department	45
(d) Restoration of Functional Activity	46
(e) The Co-operation of General Practitioners	50
(f) Psychological Factors; Co-operation of Patient	52
Appendix F.—Routine of a Fracture Department	61
CHAPTER VII. STEPS TO BE TAKEN TO GET FRACTURE SERVICES ESTABLISHED	64
Appendix G.—Statement showing distribution by counties of existing Fracture Services	75
CHAPTER VIII. AFTER-CARE	79
Appendix H.—Memorandum on Curative (Occupational) Workshops and Convalescent Training Centres provided by the Ministry of Pensions	91

	Page
CHAPTER IX. FINANCE	95
Appendix I.—Contributory Schemes	106
Appendix J.—Powers of Local Authority to Provide or Subsidise Hospital Treatment	107
Appendix K.—Note on Approved Societies	109
CHAPTER X. LONDON	111
CHAPTER XI. SCOTLAND. SOME SPECIAL CONSIDERATIONS	115
Appendix L.—Hospital Accommodation; arrange- ments between local authorities and voluntary associations	119
Appendix M.—Approved Societies (Scotland)	120
CHAPTER XII. OTHER INJURIES BY ACCIDENT	121
CHAPTER XIII. FIRST AID AND AMBULANCE	123
CHAPTER XIV. SUPPLY AND MAINTENANCE OF ARTIFICIAL LIMBS AND OTHER APPLIANCES	130
Appendix N.—Ministry of Pensions' arrangements for supply of artificial limbs	135
CHAPTER XV. VOCATIONAL TRAINING	136
CHAPTER XVI. THE HOSPITAL ALMONER'S DEPARTMENT	142
CHAPTER XVII. OTHER MATTERS	144
(a) The Teaching of Fracture Treatment to Medical Students	144
(b) Post-Graduate Study of Fracture Treatment	148
(c) Special Accident Hospitals	151
CHAPTER XVIII. SUMMARY OF CONCLUSIONS AND RECOMMENDA- TIONS	152
—————	
Appendix O.—List of Witnesses	163
Appendix P.—Statistical Inquiry into the Results obtained at Fourteen Organised Fracture Departments	166
Report	166
Form used for purpose of inquiry	170
Statistical Tables:	176
Table I.—Sex-Age distribution of cases	176
Table II.—Incidence of complications among cases reported on	177
Table III.—Proportion of cases of fracture in which delay occurred between date of Injury and date of first attendance	178
Table IV.—In-patient treatment provided at Fracture Departments	180
Table V.—Duration and Results of Treatment in cases of simple fracture without complications	182
Table VI.—Duration and Results of Treatment in cases of Fracture with one or more complications	184
Table VII.—Analysis of duration of treatment in uncompli- cated cases	186
Diagrammatic Representations	187
Appendix Q.—The Out-patient Accommodation of a Fracture Department	191
Plan A. Fracture and Orthopaedic Clinic, Mill Road Infirmary, Liverpool	193
Plan B. Fracture and Orthopaedic Clinic, Liverpool Royal Infirmary	194
Illustrations of patients exercising fractured limbs	195

WARRANTS OF APPOINTMENT

We hereby appoint—

Sir Malcolm Delevingne, K.C.B., K.C.V.O.
 Lieut.-Colonel W. T. Brain, Association of Municipal Corporations.
 Miss Muriel C. Bywaters, M.D., B.S., Board of Education.
 W. A. Cochrane, Esq., M.B., Ch.B., F.R.C.S.
 G. L. Darbyshire, Esq., L.M.S. Railway.
 W. S. Douglas, Esq., Ministry of Labour.
 W. Elger, Esq., J.P., Scottish T.U.C. General Council.
 T. Ferguson, Esq., M.D., D.Sc., F.R.C.P., Department of Health for Scotland.
 E. W. Hey Groves, Esq., M.D., D.Sc., M.S., F.R.C.S., Royal College of Surgeons of England.
 G. F. Johnson, Esq., Accident Offices Association.
 W. Lawther, Esq., Durham Miners.
 J. Marchbank, Esq., National Union of Railwaymen.
 A. W. Neville, Esq., Ministry of Health.
 Alderman Sir Harold Pink, J.P., British Hospitals Association.
 H. S. Souttar, Esq., C.B.E., M.D., M.Ch., F.R.C.S., F.R.A.C.S., British Medical Association.
 G. de Gruchy Warren, Esq., Midland Colliery Owners Mutual Indemnity Company, Limited.
 A. C. T. Woodward, Esq., M.B., Ch.B., F.R.C.S., County Councils Association.

to be a Committee to inquire into the arrangements at present in operation with a view to the restoration of the working capacity of persons injured by accidents, and to report as to what improvements or developments are desirable, and what steps are expedient to give effect thereto, regard being had to the recommendations made in the report issued by the British Medical Association in February, 1935, on "Fractures".

We further appoint Sir Malcolm Delevingne to be Chairman, and A. E. Quine, Esq., M.B., F.R.C.S., of the Ministry of Health, and J. A. Simes, Esq., O.B.E., to be Secretaries of the said Committee.

(Signed) JOHN SIMON.
 KINGSLEY WOOD.
 GODFREY P. COLLINS.

April, 1936.

We hereby appoint J. F. E. Prideaux, Esq., M.R.C.S., an Assistant Director of Medical Services, Ministry of Pensions, to be a member of the Inter-Departmental Committee on the Rehabilitation of Persons Injured in Accidents appointed in April, 1936.

(Signed) JOHN SIMON.
KINGSLEY WOOD.
GODFREY P. COLLINS.

May, 1936.

We hereby appoint H. H. Wiles, Esq., Assistant Secretary, Ministry of Labour, to be a member of the Inter-Departmental Committee on the Rehabilitation of Persons injured in Accidents appointed in April, 1936, in the place of W. S. Douglas, Esq., who has resigned from the Committee.

(Signed) KINGSLEY WOOD.
JOHN SIMON.
WALTER E. ELLIOT.

February, 1937.

Note.—The estimated gross cost of the preparation of this Report (including the expenses of the Committee) is* £1,562 2s. 4d. of which* £209 os. od. represents the estimated gross cost of printing and publishing the Report.

* Includes cost of Interim Report

INTER - DEPARTMENTAL COMMITTEE ON THE REHABILITATION OF PERSONS INJURED BY ACCIDENTS

To:

The Rt. Hon. Sir SAMUEL HOARE, Bart., G.C.S.I., G.B.E.,
C.M.G., M.P.

H.M. Secretary of State for Home Affairs.

The Rt. Hon. WALTER E. ELLIOT, M.C., M.P.,
Minister of Health.

Lt. Col. the Rt. Hon. JOHN COLVILLE, M.P.,
H.M. Secretary of State for Scotland.

I.—INTRODUCTION.

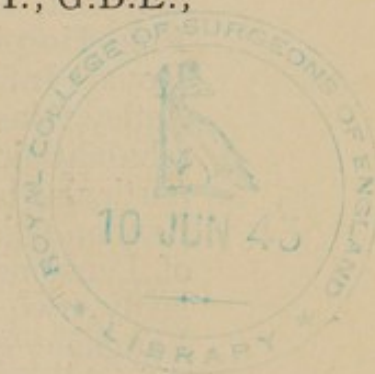
SIRS,

We have the honour to present our Final Report on the Inquiry which we were appointed to make into the arrangements at present in operation with a view to the restoration of the working capacity of persons injured by accidents, the improvements or developments which are desirable and the steps which would be expedient for giving effect to such improvements or developments.

In May, 1937, we submitted an Interim Report embodying the outline of a scheme for the organisation of Services or Clinics for the treatment of fractures, as this appeared to be the most urgent of the matters before us. The question of the provision of such services was already then being considered in many different quarters, plans were being prepared and in a number of cases requests were being made to the Committee for guidance, or action was being postponed until the Committee had reported. Before submitting the scheme we had sent it to all hospitals with medical schools, 11 other hospitals of a representative character in different parts of the country and a number of Medical Officers of Health, and had taken account, in the preparation of the scheme, of their observations and suggestions. We have found no reason, as a result of our further inquiry and consideration of the subject, to modify the scheme in any point of substance and we embody it in a fuller and more complete form in the present Report.

In the course of our inquiry we have taken a considerable body of formal evidence. We append to this Report a list of the witnesses who appeared before us.

We have visited a number of hospitals where Fracture Services were already established and seen the Service in operation, and also some where plans for such services were being considered, or difficulties in the establishment of such services were being experienced.



We have examined the arrangements in the departments for physio-therapy and remedial exercises of a number of hospitals, among which we would specially mention the Royal National Orthopaedic Hospital (Great Portland Street and Stanmore) for cripples, the Albert Dock Hospital (seamen), the West London Hospital, the Newcastle Royal Victoria Infirmary, the Royal Free Hospital, the Royal Northern Hospital, the Manchester Royal Infirmary, the Liverpool Royal Infirmary and the Astley Ainslie Institution, Edinburgh. We have also seen the rehabilitation arrangements made by some large employers, in particular by the L.M.S. Railway at Crewe (Dr. Moore), and the London Brick Company at Stewartby near Bedford; the Ministry of Pensions Hospital for neurasthenic cases at Cosham; and lastly, two of the Ministry of Labour Camps at Allerton and Langdale End near Scarborough in Yorkshire for the reconditioning of unemployed persons.

In connection with the question of the vocational training of persons permanently disabled for pursuing their previous occupation, we have visited Queen Mary's Hospital at Roehampton, the Cripples' Training College at Leatherhead, the Ministry of Labour Training Centre at Watford, and the Enham Village Centre.

Apart from evidence formally taken by the Committee, we have had the advantage of consultation with many who were in a position to give us valuable help; we may mention specially the Medical Department of the London County Council, the Deans' Committee of the London Teaching Hospitals, the Surgeons in charge of Fracture Clinics, and the Director of the Industrial Welfare Society (Mr. Hyde). We shall refer to these in more detail in the course of this Report.

We have given consideration to the position in Scotland where the conditions present some special problems.

We have obtained statistical information as to the number, character, distribution, causation, and duration of disability of fractures and other injuries which was indispensable for the proper appreciation of the problems we had to consider, partly from hospitals generally, partly from particular hospitals selected as representative in different parts of the country. We desire to acknowledge warmly the trouble taken by the surgeons and others concerned in the preparation of the returns.

Information on a variety of points has been readily placed at our disposal by the Home Office, the Ministries of Health, Labour, and Pensions, the Board of Education, the Central Miners' Welfare Committee, and the National Fitness Council and we have had the advantage of consultation with them in the preparation of our proposals.

The Foreign Office was asked at an early stage of our proceedings to obtain through H.M. Ministers in the United States, Belgium, Denmark, France, Germany, Holland and Sweden, information as to any special arrangements made in those countries for the rehabilitation of injured persons, by what authorities established, on what lines organised, how financed, etc. We desire to express our appreciation of the information collected for us.

The International Labour Office at Geneva, to which we also applied for any information in its possession as to the practice abroad, was good enough to prepare for us a memorandum on the arrangements—if any—in a number of important countries (United States of America, Austria, Belgium, France, Germany, Italy and the Netherlands). Our Secretary, Dr. Quine, also has visited, and reported to us on, Dr. Böhler's Institution (Unfall-krankenhaus) in Vienna and certain hospitals in Westphalia and the Ruhr.

We also had the advantage of the information collected by Mr. F. A. Lyon, Secretary of the Seamen's Hospital Society, and Mr. H. E. Griffiths, F.R.C.S., who visited the United States of America in order to examine rehabilitation arrangements in that country, before completing the plans for the new Albert Dock Hospital.

Since the appointment of the Committee, the Report of a Voluntary Hospitals Commission under the auspices of the British Hospitals Association, of which Lord Sankey was Chairman, has been issued. Its recommendations on certain matters, to which reference will be made in this Report, have been of assistance to us in framing our proposals.

The decision of the Government to appoint a Royal Commission to "inquire into the operation and effects of the system of workmen's compensation for injuries due to employment . . . and the relation of this system . . . to arrangements for the treatment of injured workmen and the restoration of their working capacity" has made it unnecessary for us to consider in detail, and make recommendations as to, the modifications of the Workmen's Compensation Acts which might be needed in view of the conclusions we have reached and the arrangements we propose for the restoration of the working capacity of injured persons.

We deeply regret that in the course of the inquiry we lost one of our members, Lt.-Col. Brain, who died in April, 1938. Col. Brain's experience and sound judgment had been of great value to the Committee. In view of the advanced stage which our inquiry had, at that time, reached, it was not considered necessary to make a further appointment.

II.—THE SUBJECT OF THE INQUIRY.

The subject which the Committee was asked to investigate was the arrangements for the restoration of the working capacity of persons injured by accidents. In the full meaning of the words, that would cover the whole range of treatment of the injured person from the time of the occurrence of the accident to the point when his condition is restored to the pre-accident state and he is able to resume his previous occupation or, in cases where full restoration is not possible, until the fullest possible measure of restoration has been effected.

Three separate stages can be distinguished:—

(1) The immediate treatment given on the occurrence of the accident by First Aid and Ambulance services.

(2) The hospital treatment* which includes (a) the actual surgical treatment, (b) the physio-therapy† and remedial exercises, for restoring the muscles, joints, etc., involved to their full functional activity.

(3) For certain classes of case, a stage of general reconditioning after the completion of the hospital treatment.

We were also asked to consider what arrangements could be made to train for some new occupation those cases where complete restoration has not been possible and the nature of the permanent disability is such as to preclude the injured person from resuming his former occupation.

We understood that our inquiry was to be directed chiefly to the second and later stages and that a general review by us of the First Aid and Ambulance services of the country was not contemplated. We have accordingly not attempted any such review: but these services have an important bearing on the arrangements to be made for the later stages and cannot, in the consideration of these arrangements, be entirely left out of account. We shall have something to say about them later in our Report (Chapter XIII).

* The Committee has not considered that it was called upon to inquire into arrangements for treatment in private practice. Some of our recommendations should have an important influence on the standard of such treatment. On the other hand the question of the relation of the general practitioner to an established Fracture Service and of co-operation between them is important and will be discussed in this Report (Chapter VI).

† By physio-therapy is meant treatment by light, heat, electricity, etc., and it includes massage.

III.—STATISTICAL ASPECTS OF THE SUBJECT OF THE INQUIRY.

We summarise briefly in this chapter the statistical information bearing on the subject of our inquiry which we have been able to collect.

1. *Number of cases treated in hospital of (a) fractures, (b) other injuries by accident.*

In reply to a questionnaire sent to all hospital authorities in Great Britain likely to be concerned, returns were supplied by 853 voluntary hospitals, and in respect of 121 municipal hospitals and 448 Poor Law Infirmaries, of the number of new cases of (a) fractures, (b) all accidents, treated in the year 1935. Of these, 84 voluntary hospitals and 20 municipal hospitals stated that they rarely or never treated fracture cases. Several replied that they were unable to furnish the number of cases treated.

According to these returns, the total number of new fracture cases treated in 1935 was 204,738. Of this number 139,129 were treated as out-patients only and 65,609 as in-patients. The total number of accidents (including fractures) treated was 1,303,478; and of this number 1,166,758 were treated as out-patients only, and 136,720 as in-patients. It will be seen from these figures that in the case of fractures the proportion treated as in-patients was about 32 per cent., in the case of all accidents about 10 per cent.

We append to this Chapter a Table showing the distribution of the cases between the voluntary hospitals, the municipal hospitals and the Poor Law Infirmaries, and in the case of the voluntary hospitals between hospitals with medical schools and groups of non-teaching hospitals graded according to the number of beds.

It will be seen that the voluntary hospitals accounted for 178,945 of the fracture cases (of which 49,462 were in-patient cases); the municipal hospitals for 23,552 (of which 14,180 were in-patient cases), and the Poor Law Infirmaries for 2,241 (of which 1,967 were in-patient cases). It must be borne in mind that many municipal hospitals have no out-patient departments; and, as regards the infirmaries, most of the cases would be cases of more or less permanent invalidity.

The figures in the Table can only be regarded as giving a rough idea of the position. The difficulty of obtaining exact statistics of the cases treated in our hospitals (or, at any rate, of fracture cases) is somewhat remarkable. The figures that have been supplied have in many cases had to be extracted with a great deal of trouble from the general hospital records.

2. *Results of treatment.*

If it has been difficult to obtain accurate information with regard to the number treated, it has been even more difficult to obtain information as to the results of treatment. Only a few hospitals have any system of following up their old patients or can give any information as to final results. We are therefore without information, in regard to the different types of fractures, either of the number or proportion of cases resulting in some degree of permanent disability, or in other cases, the duration of the treatment or the period during which disablement lasted before full capacity was recovered.

Information is available as to the results obtained in Böhler's Clinic at Vienna and in some of the fracture clinics established in this country.

We have endeavoured to fill the gap in some measure and to provide some guidance as to the results that may be expected under an organised system of treatment by inviting a number of experienced surgeons in charge of Fracture Departments to analyse for us the records of a consecutive series of unselected cases of fracture which were seen for the first time not later than 30th June, 1937, and treated throughout by the Department.

Fourteen Fracture Departments took part in this inquiry—and, in all, 6,364 cases were analysed with regard to the nature of the injury, the age and sex of the patient, the duration of treatment, the end result and other points. The organisation of the inquiry was entrusted to Dr. D. J. Williamson of the Ministry of Health. We are greatly indebted to him and to the Surgeons who collected and furnished the information. The work of examining, checking and tabulating the information sent in by the several Fracture Departments, which fell entirely on Dr. Williamson, proved to be extremely laborious. There were many doubtful points to clear up and the entries had to be scrutinised carefully to guard against mistakes.

The results of the inquiry are embodied in the series of Tables, and in Dr. Williamson's commentary upon them, which form Appendix Q to our Report. They will be found, we believe, to contain valuable information, not otherwise available, which will be of use in the consideration of various matters arising on our Report. For instance, it appears that even in these organised Departments, a not inconsiderable number of cases are discharged before function is fully restored (23·7 per cent. of the uncomplicated cases of simple fracture). Or again, the facts disclosed as to sex and age distribution—(of the cases analysed, 45 per cent. were men between 15 and 65; 23·5 were women between 15 and 65; 25·7 were children under 15; about 6 per cent. were over 65)—have a bearing on the question of the need for special provision to restore working capacity. We would invite attention, in particular, to the evidence which the Tables provide of the importance of what are liable to be considered minor injuries, especially injuries to the fingers and toes.

For example, 136 out of 500 cases of fractured fingers are compound, i.e., 27 per cent. The evidence indicates the necessity of getting such cases to hospital at once.

Perhaps the most striking feature of the Tables is the situation disclosed as regards the delay in many cases, even cases of serious injury, in seeking treatment.

Though statistics are unobtainable there is much information available as to the bad results met with in many cases treated under the system which has prevailed hitherto. Orthopaedic hospitals and surgeons of experience, to whom the failures have finally come, have spoken strongly of the disastrous results that have been brought to them and have furnished us with particulars of cases which should have been repaired in a few weeks but have involved months and even years of suffering and difficult and dangerous operations, and in many, serious and permanent disability. While such information cannot, of course, be put into any statistical form it points to serious defects in the arrangements under which fractures are at present treated in a large number of our hospitals. We refer to this again later.

3. *Geographical Distribution of Cases.*

We append to this Chapter a Table showing the distribution by Counties of the cases included in the Returns supplied by the hospitals. The small number of cases, mostly special, treated in the Poor Law Infirmaries have been excluded.

We hope this information may be useful to the Departments and to local authorities and others by indicating the size of the problem in the different localities.

4. *Distribution according to the circumstances of the cases.*

For convenience of treatment we have divided the cases into three major groups, viz.:—

- (a) Industrial (i.e., accidents occurring in the course of employment in industry);
- (b) Road traffic (i.e., accidents occurring on the highway in which a vehicle is involved);
- (c) Miscellaneous and general (i.e., sport, domestic, etc.).

It was important for the purpose of our inquiry, as will appear subsequently, to obtain a rough idea as to the proportion of cases falling under each of these headings, and we accordingly applied to a number of leading hospitals in selected districts which might be regarded as being representative, to assist the Committee by recording the number of fractures dealt with in each group during three winter months and three summer months.

The two periods winter and summer were selected for the reason that some classes of accidents are more numerous at certain seasons than at others.

The information furnished by the hospitals has been summarized in the following Table.

TABLE SHOWING THE NUMBERS OF NEW FRACTURE CASES TREATED IN CERTAIN HOSPITALS DURING THREE WINTER MONTHS OF 1937, AND ALSO DURING THREE SUMMER MONTHS OF 1937 WHICH WERE DUE TO (1) INDUSTRIAL ACCIDENTS; (2) ROAD TRAFFIC ACCIDENTS; AND (3) OTHER CLASSES OF ACCIDENTS (SPORT, DOMESTIC, ETC.)

	Number of fractures with percentage proportion.			
	Industrial Accidents.	Road traffic Accidents.	Other Accidents.	Total.
Three winter months.				
	Per cent.	Per cent.	Per cent.	
*Three London voluntary hospitals	324 (37.4)	60 (6.9)	483 (55.7)	867
†Four Liverpool voluntary hospitals	322 (35.2)	67 (7.3)	525 (57.5)	914
‡Nine Provincial voluntary hospitals in industrial districts	1,502 (30.9)	677 (13.9)	2,690 (55.2)	4,869
§ Seven other Provincial voluntary hospitals ...	626 (30.9)	372 (18.3)	1,031 (50.8)	2,029
Three summer months.				
* Three London voluntary hospitals	233 (30.7)	55 (7.3)	470 (62.0)	758
†Four Liverpool voluntary hospitals	277 (30.9)	153 (17.0)	468 (52.1)	898
‡Nine Provincial voluntary hospitals in industrial districts	1,709 (26.6)	884 (13.7)	3,845 (59.7)	6,438
§Seven other Provincial voluntary hospitals ...	629 (25.0)	620 (24.7)	1,264 (50.3)	2,513
Three winter and three summer months combined.				
*Three London voluntary hospitals	557 (34.3)	115 (7.1)	953 (58.6)	1,625
†Four Liverpool voluntary hospitals	599 (33.0)	220 (12.2)	993 (54.8)	1,812
‡Nine Provincial voluntary hospitals in industrial districts	3,211 (28.4)	1,561 (13.8)	6,535 (57.8)	11,307
§Seven other Provincial voluntary hospitals ...	1,255 (27.6)	992 (21.8)	2,295 (50.6)	4,542
Totals	5,622 (29.2)	2,888 (14.9)	10,776 (55.9)	19,286
(for the whole of the year 1936)				
Manchester Royal Infirmary	292 (12.2)	369 (15.4)	1,738 (72.4)	2,399

* St. Bartholomew's, Guy's and St. Thomas's.

† David Lewis Northern, Royal Infirmary, Stanley, and Royal Southern.

‡ Birmingham; General and Queens; Bristol: General and Royal Infirmary; Leeds General Infirmary, Newcastle-on-Tyne Royal Victoria Infirmary, Nottingham General, Sheffield Royal and Glasgow Western Infirmary.

§ Bath Royal United; Bournemouth Royal Victoria and West Hants; East Suffolk and Ipswich; Oxford, Radcliffe Infirmary; Southampton, Royal South Hants; Aberdeen Royal Infirmary; Edinburgh Royal Infirmary.

5. *Distribution of industrial cases according to industry*

Information as to the number of accidents occurring in the major industries of the country is available in the Workmen's Compensation Statistics issued each year by the Home Office, and, in more detail, from the separate returns issued by the responsible Departments, i.e., the Factory Department of the Home Office in respect of factories, docks, wharves and quays and the larger building operations; the Mines Department in respect of Mines, and the Ministry of Transport in respect of railways.

The latest Statistics under the Workmen's Compensation Acts are those for 1937. The number of *new* cases of disablement by accident in which compensation was paid in that year in each of the seven major industries of the country was as follows:—

Shipping	7,332
Factories	218,532
Railways	18,176
Docks	9,861
Mines	139,230
Quarries	6,861
Constructional work	9,658
Total	<hr/> 409,650 <hr/>

The Departments have been good enough, at our request, to extract from the reports received by them the number and nature of the cases which involved fractures and as the information may be of use to industry in connection with our Report, we append to this Chapter Tables summarizing this information. In the case of mines, the number of such cases (including dislocations) in 1935 was 1,734 and the average number during the three years 1927-9 was 2,031. In the case of factories and other places covered by the Factory Act, the number (excluding cases of amputation) in 1935 was 8,530 (of which 783 were injuries to women). On the railways, out of a total number (including passengers) of 23,220 injured in 1935, 1,269 were cases of fracture or dislocation.

It may be convenient to add here, for comparison, that the total number of persons injured in road accidents during 1937 was 226,355.

6. *Financial aspect of the Subject*

The financial loss to the community resulting from injuries by accident must be enormous. Of the two ways in which this loss can be diminished, (a) the prevention of accidents, (b) mitigation of the results of accidents by improvements in the treatment of the injured, the former, which is the aim of

the safety provisions of the Factory, Mines and other Acts, the State systems of Inspection, such movements as the Safety First Association and so on, seems to have received much more attention so far than the latter. The financial loss is not, of course, the primary consideration either in the measures for preventing accidents or in measures for improved treatment—that is the prevention or mitigation of suffering and misery; but it is clear that, if as a result of improved systems of treatment, a substantial shortening can be effected in the period required for treatment and restoration of working capacity, i.e., the disability period and if, further, the proportion of cases resulting in partial or total permanent disablement can be greatly reduced, the saving to the country would be very great.

There is no means of estimating the cost to the community of its accident roll, but it must run into many millions of pounds. The cost of workmen's compensation under the Workmen's Compensation Acts as estimated by the Home Office in its annual Statistics for the five years ending 1937 averages about £11,000,000 per annum and for 1937 it is estimated to have been about £13,000,000*—a figure which includes payments in respect of cases which originated in earlier years and continued on the compensation list. Of the accident cases in the seven major industries in which compensation terminated in 1937 there were 13,694 which had lasted 13 weeks and less than 26, and 6,836 which had lasted 26 weeks and over. Of the cases in which compensation was not terminated in 1937 there were 5,546 in which it had lasted over a year but under two years, 6,056 in which it had lasted over two years but under five years, 6,173 in which it had lasted over five but under 10 years and 7,978 cases in which it had lasted for more than 10 years. In the same year lump-sum settlements were made in 7,329 cases which had been in receipt of weekly compensation for 26 weeks and over, and the amount so paid in these cases was £1,571,057.

These figures do not include considerable sums recovered as damages at common law, and take no account of the indirect damage to industry caused by the loss, temporary or permanent, of skilled workers.

Industrial accidents do not, it is estimated, form more than a third of the total number. A very large sum must be allowed for the medical and sickness benefit among the general population, which in the case of persons insured under the National Health Insurance Acts falls on National Health Insurance Funds; and for assistance given by the Public Assistance authorities in necessitous cases. To this must be added the cost to private individuals who have to bear the expense and loss themselves.

* A small proportion of this amount (less than 10 per cent.) was in respect of compensation for cases of industrial disease.

APPENDIX A.

SUMMARY OF RETURNS RECEIVED IN REPLY TO THE COMMITTEE'S CIRCULAR LETTER AND QUESTIONNAIRE DATED 3RD JULY, 1936.

[The Questionnaire was addressed to 853 Voluntary Hospitals and 121 Municipal. 45 Voluntary Hospitals did not reply. 84 Voluntary Hospitals and 20 Municipal said that Fractures were rarely, if ever, treated there. About 40 Voluntary Hospitals said they were unable to furnish statistics.] Statement showing for Great Britain the number of new fracture cases and of new accident cases dealt with in 1935 in classified Hospitals and in Poor Law Infirmaries.

	GREAT BRITAIN.			ADMINISTRATIVE COUNTY AND CITY OF LONDON.			ENGLAND (excluding the Administrative County and City of London).			WALES.			SCOTLAND.		
	No. of Hos- pitals and P.L. Infs. (2)	O.P. only. (3)	I.P. (4)	No. of Hos- pitals and P.L. Infs. (5)	O.P. only (6)	I.P. (7)	No. of Hos- pitals and P.L. Infs. (8)	O.P. only. (9)	I.P. (10)	No. of Hos- pitals and P.L. Infs. (11)	O.P. only. (12)	I.P. (13)	No. of Hos- pitals and P.L. Infs. (14)	O.P. only. (15)	I.P. (16)
(1)															

Note : O.P. means Out-Patient
I.P. " In-Patient

II

FRACTURES

I.															
AT VOLUNTARY HOSPITALS.															
General Hospitals.															
Class I (with medical schools)															
" II 200 or more beds (without med. sch.)	34	36,167	14,590	12	7,717	2,170	15	19,852	8,239	1	Not. av.	399	6	8,598	3,782
" III 150-199	48	32,848	8,590	5	5,341	672	39	25,605	6,984	2	1,776	585	2	126	349
" IV 125-149	38	17,105	5,106	4	874	198	30	15,013	4,165	—	—	—	4	1,218	743
" V 100-124	27	7,078	2,567	1	290	60	23	6,760	2,227	1	28	194	2	—	86
" VI 30-99 beds	47	9,662	3,853	5	1,827	343	37	6,152	2,865	2	665	87	3	1,018	558
" VII less than 30 beds	255	18,844	9,467	9	1,109	236	198	15,320	7,601	28	1,772	1,080	20	643	550
Special Hospitals—	333	4,069	3,621	1	—	—	242	3,209	2,687	32	483	353	58	377	581
Orthopaedic	23	275	288	2	—	—	19	275	288	1	—	—	1	—	—
Children's	48	3,435	1,380	14	321	125	28	2,373	690	1	—	22	5	741	543
Total : (Voluntary Hospitals)	853	129,483	49,462	53	17,479	3,804	631	94,559	35,746	68	4,724	2,720	101	12,721	7,192

AT VOLUNTARY HOSPITALS.

General Hospitals.

Class I (with medical schools)

" II 200 or more beds (without med. sch.)

" III 150-199

" IV 125-149

" V 100-124

" VI 30-99 beds

" VII less than 30 beds

Special Hospitals—

Orthopaedic

Children's

Total : (Voluntary Hospitals)

(1)	GREAT BRITAIN.			ADMINISTRATIVE COUNTY AND CITY OF LONDON.			ENGLAND (excluding the Administrative County and City of London).			WALES.			SCOTLAND.		
	No. of Hos- pitals and P.L. Infs. (2)	O.P. only. (3)	I.P. (4)	No. of Hos- pitals and P.L. Infs. (5)	O.P. only (6)	I.P. (7)	No. of Hos- pitals and P.L. Infs. (8)	O.P. only. (9)	I.P. (10)	No. of Hos- pitals and P.L. Infs. (11)	O.P. only. (12)	I.P. (13)	No. of Hos- pitals and P.L. Infs. (14)	O.P. only. (15)	I.P. (16)
FRACTURES— <i>contd.</i>															
II. At (a) HOSPITALS AND (b) POOR LAW INFIRMARIES OF COUNTY COUN- CILS AND LOCAL AUTHORITIES— (a) Hospitals—General Orthopaedic Children's Total : (C.C. & L.A. Hospitals) (b) Poor Law Infirmaryes Grand Total : New Fracture Cases	117	9,069	13,924	28	5,419	5,870	73	3,288	7,577	5	106	186	11	256	291
	2	—	5	—	—	—	2	—	5	—	—	—	—	—	—
	2	303	251	—	—	—	2	303	251	—	—	—	—	—	—
	121	9,372	14,180	28	5,419	5,870	77	3,591	7,833	5	106	186	11	256	291
	448	274	1,967	—	—	—	404	195	1,756	41	78	164	3	1	47
	1,422	139,129	65,609	81	22,898	9,674	1,112	98,345	45,335	114	4,908	3,070	115	12,978	7,530
		204,738			32,572			143,680			7,978			20,508	

APPENDIX B.

SUMMARY OF RETURNS RECEIVED IN REPLY TO THE COMMITTEE'S CIRCULAR LETTER AND QUESTIONNAIRE DATED 3RD JULY, 1936.

Statement indicating the distribution by Counties of the numbers of new accident cases and of new fracture cases dealt with in 1935 in Voluntary Hospitals and in the Hospitals of County Councils and Local Authorities. The figures for Poor Law Infirmaries are not included.

I.—ENGLAND AND WALES.

Name of Geographical County.	No. of Hospitals.	FRACTURES						ALL ACCIDENTS (including Fractures).					
		Voluntary Hospitals.		Hospitals of County Councils and Local Authorities.		Totals.		Voluntary Hospitals.		Hospitals of County Councils and Local Authorities.		Totals.	
		O.P. only. (3)	I.P. (4)	O.P. only. (5)	I.P. (6)	O.P. only. (7)	I.P. (8)	O.P. only. (9)	I.P. (10)	O.P. only (11)	I.P. (12)	O.P. only. (13)	I.P. (14)
Bedford	3	165	224	—	—	165	224	1,688	461	—	—	1,688	461
Berks	10	35	67	6	22	41	89	4,284	672	63	42	4,347	714
Bucks	7	227	223	—	—	227	223	1,897	472	—	—	1,897	472
Cambridge	1	Not av.	219	—	—	Not av.	219	2,586	Not av.	—	—	2,586	Not av.
Isle of Ely	1	31	21	—	—	31	21	131	62	—	—	131	62
Chester	28	2,305	1,316	8	146	2,313	1,462	23,976	3,293	57	289	24,033	3,582
Cornwall	14	204	344	—	—	204	344	832	756	—	—	832	756
Cumberland	9	562	305	—	—	562	305	2,621	551	—	—	2,621	551
Derby	12	1,114	272	3	35	1,117	307	18,557	1,753	34	97	18,591	1,850
Devon	34	152	537	—	49	152	586	5,232	1,235	—	123	5,232	1,358
Dorset	11	175	192	—	—	175	192	1,266	574	—	—	1,266	574
Durham	17	4,264	1,822	39	34	4,303	1,856	24,317	3,825	467	125	24,784	3,950
Essex	30	4,037	1,014	87	688	4,124	1,702	34,136	2,235	312	1,825	34,448	4,060
Gloucester	25	2,952	1,009	—	175	2,952	1,184	51,828	1,040	—	309	51,828	1,349
Hereford	5	195	123	—	—	195	123	870	223	—	—	870	223
Hertford	14	531	389	24	137	555	526	5,743	848	80	333	5,823	1,181
Huntingdon	1	4	60	—	—	4	60	164	68	—	—	164	68
Kent	34	3,648	994	—	325	3,648	1,319	22,643	2,487	—	472	22,643	2,959
Lancaster	73	18,505	4,485	1,009	2,247	19,514	6,732	180,360	10,535	13,477	5,638	193,837	16,173
Leicester	12	1,987	473	—	—	1,987	473	15,507	981	—	—	15,507	981
Lincs. (Holland)	3	30	125	—	2	30	127	60	215	—	2	60	217

APPENDIX C.

ACCIDENTS RESULTING IN FRACTURES WHICH WERE REPORTED TO THE
HOME OFFICE UNDER THE FACTORY AND WORKSHOP ACTS IN 1935.

(Table supplied by the Factory Department of the Home Office)

GREAT BRITAIN.

Part affected.			Right.	Left.	Not stated.	Total.
Shoulder	...	...	20	31	39	90
Clavicle	...	...	24	33	73	130
Arm	...	...	119	139	85	343
Elbow	...	...	54	59	34	147
Forearm	...	...	138	144	42	324
Radius	...	...	38	40	13	91
Ulnar	...	...	11	6	4	21
Wrist	...	...	368	312	185	865
Hand	...	...	190	129	68	387
Fingers	...	...	570	657	229	1,456
Thumb	...	...	157	159	54	370
Ribs	...	...	—	—	728	728
Spine	...	...	—	—	48	48
Pelvis	...	...	—	—	56	56
Hip	...	...	2	1	2	5
Thigh	...	...	46	43	32	121
Patella	...	...	12	24	34	70
Leg	...	...	191	159	134	484
Tibia	...	...	29	21	13	63
Fibula	...	...	44	36	25	105
Ankle	...	...	139	112	120	371
Foot	...	...	301	297	169	767
Toes	...	...	—	—	1,481	1,481
Unclassifiable	...	...	1	—	6	7
Totals	...	...	2,454	2,402	3,674	8,530

APPENDIX D.

FRACTURES AND DISLOCATIONS DUE TO ACCIDENTS OCCURRING AT MINES UNDER THE COAL MINES ACT, 1911 (EXCLUDING THE STRATIFIED IRONSTONE MINES OF CLEVELAND, LINCS. AND NORTHANTS) DURING THE PERIOD 1927-9 (AVERAGE NUMBER) AND IN THE YEAR 1935.

(Tables supplied by the Ministry of Mines.)

District (and Average No. of Persons Employed.)	Fractures of						Dislocations of		
	Thigh.	Leg.	Arm.	Rib.	Head.	Total.	Upper Extremity.	Lower Extremity.	Total.
Northumberland :									
1927-9 (49,195)	4	35	22	10	5	76	5	3	8
1935 (44,435)	1	23	14	5	3	46	2	—	2
Durham :									
1927-9 (133,719)	16	118	78	30	13	255	12	4	16
1935 (107,756)	14	110	80	13	7	224	9	2	11
Cumberland and Westmor- land :									
1927-9 (10,653)	2	6	2	2	—	12	1	—	1
1935 (6,406)	2	4	4	1	—	11	—	—	—
Lancashire and Cheshire :									
1927-9 (83,976)	12	58	22	8	4	104	10	1	11
1935 (61,045)	10	53	22	7	6	98	7	2	9
Yorkshire :									
*1927-9 (180,177)	24	156	77	23	10	290	15	7	22
1935 (141,163)	12	98	55	11	2	178	6	2	8
Nottingham and North Derby :									
*1927-9 (108,784)	21	104	37	12	6	180	9	2	11
1935 (88,757)	12	82	38	13	6	151	5	6	11
South Derby and Leicester :									
*1927-9 (16,133)	3	13	6	3	1	26	2	2	4
1935 (12,665)	—	15	3	1	1	20	1	—	1

COAL MINES ACT, 1911.

SEPARATE PARTICULARS FOR 1927-9 (AVERAGE) OF THE COALFIELDS COMBINED IN PRECEDING TABLE.

District.	Fractures of					Dislocations of		
	Thigh.	Leg.	Arm.	Rib.	Head.	Total.	Upper Extremity.	Lower Extremity.
South Yorkshire ...	17	122	65	18	6	228	11	5
West Yorkshire ...	7	34	12	5	4	62	4	2
Nottingham ...	11	48	18	4	4	85	5	1
North Derby ...	10	56	19	8	2	95	4	1
South Derby ...	1	4	3	1	—	9	—	1
Leicester ...	2	9	3	2	1	17	2	1
Shropshire ...	—	4	1	—	—	5	—	—
South Staffs. and Worcs....	2	11	7	2	—	22	1	—
Cannock Chase ...	5	18	9	5	1	38	1	—
Warwick ...	2	16	9	3	1	31	1	1
Bristol ...	—	1	—	—	—	1	—	—
Somerset ...	—	5	2	1	—	8	1	—
Kent ...	—	4	3	1	—	8	1	—
Fife, Clackmannan, Kinross and Sutherland.	4	27	15	9	2	57	4	1
Lothians (Mid and East and Peebles.	2	22	12	11	4	51	2	1
Lanark, Linlithgow, Renfrew, Dumbarton and Stirling.	10	60	28	17	5	120	6	5
Ayrshire, Dumfries and Argyll.	2	13	4	3	2	24	2	1
								3

AVERAGE NUMBER OF PERSONS EMPLOYED IN 1927-9.

South Yorkshire	...	...	121,275	Shropshire	...	...	3,247	Fife, Clackmannan, Kinross and Sutherland.	23,389
West Yorkshire	...	...	58,902	South Staffs. and Worcs.	...	...	5,973	Lothians (Mid and East and Peebles.	13,631
Nottingham	...	...	54,397	Cannock Chase	...	...	24,269	Lanark, Linlithgow, Renfrew, Dumbarton and Stirling.	55,325
North Derby	...	...	54,387	Warwick	...	...	18,190	Ayrshire, Dumfries and Argyll...	13,309
South Derby	...	...	4,531	Bristol	...	...	994		
Leicester	...	...	11,602	Somerset	...	...	4,256		
				Kent	...	...	3,568		

APPENDIX E.

STATEMENT SHOWING THE TOTAL NUMBER OF PERSONS INJURED ON THE RAILWAYS IN GREAT BRITAIN IN THE YEARS 1932-5 AND INDICATING THE NUMBER, AND PERCENTAGE, OF CASES OF FRACTURE AND DISLOCATION.

(Figures extracted from the Annual Reports of the Ministry of Transport.)

Year.			Total number of persons injured.*	Fractures and dislocations.†	Per cent. of fractures and dislocations.
1932	...	...	21,033	1,007	4·8
1933	...	...	21,696	886	4·1
1934	...	...	22,229	1,165	5·2
1935	...	...	23,220	1,269	5·5

* All injuries to passengers and persons, other than railway servants, however slight they may be are required to be reported. In the case of railway servants only those accidents which cause the servant to be absent for more than three days (one day in years 1932 and 1933) are now required to be reported.

† No separate figures for cases of fracture.

IV. SCOPE OF THE REPORT

The terms of reference in our warrant of appointment directed us to inquire into the arrangements for the treatment of "persons injured by accidents". This was a wide field and we have not attempted or thought it necessary to explore the whole of it. In the main we have concentrated on the question of treatment of fractures which was the subject to which our attention was specially directed by the warrant of appointment (we regarded certain other classes of injury such as dislocations and sprains as coming within the same category), but we have not excluded consideration of other classes of injury and have sought the advice of those qualified to give it as to the possibilities of developing a Fracture Service into a more general traumatic service.

It is obvious that there are some classes of injury by accident, such as serious injuries of the internal organs or the brain, which fall into an entirely different category from injuries to the bones, and could not suitably be treated by a staff which specialised in the latter class of injury. The arguments which can be used in favour of specialisation in regard to the treatment of fractures apply with equal effect as regards specialisation in the treatment of injuries of the internal organs and the brain. At present they are treated efficiently, we believe, in the general surgical wards by those who have interested themselves in, and acquired the technique for, that kind of case. We have no reason for supposing that any change is called for in regard to such cases, though it may well be that the recommendations we make later in regard to "after-care" have their application to this class of case as well.

We have come to the conclusion therefore that proposals for the institution of "general" traumatic services are not called for, and would under conditions in this country be impracticable. We are supported in this conclusion by the evidence of the Royal College of Surgeons. Sir Cuthbert Wallace said:—

"Traumatic surgery covers such a lot of ground. A man may have a crack on the head or a ruptured intestine. You cannot expect a man to specialise in all these things. They really belong to different departments. . . . By talking of traumatic surgery you are mixing up a lot of things, it appears to me."

On the other hand, there is a very large field of injuries which are of a minor character in that they do not require in-patient treatment but which may have important results in the effect on working capacity if not promptly and efficiently treated.*

* These injuries may be roughly classified into :—

- (a) Injuries of soft parts, i.e., the skin and the underlying tissues, muscles, tendons, vessels and nerves.
- (b) Cuts, bruises, scalds, burns and crushes.
- (c) Foreign bodies (e.g., glass, grit, needles) in the soft parts or in any orifice—eye, ear, nose, throat, etc.
- (d) A number of miscellaneous results of accidents such as bites, stings, electrical injuries, poisoning from corrosive, narcotic, and other poisons, asphyxia and gas poisoning, heat-stroke, etc.

The numerous injuries to hands and fingers are a good instance. These minor injuries form the great bulk of the work of every casualty department and are liable to be left to junior house surgeons, dressers and nurses to treat. We have no evidence to show that it is necessary to apply in full to the great majority of these cases the principles of organization which are needed in a Fracture Service. There is no reason, of course, why a Fracture Service should not be enlarged to take charge of this group of cases, if the conditions permit; and we think it extremely probable that a Fracture Service, once established, will attract to itself, if not all the cases in this group, at least those the nature of which makes the application of the principles of continuity of treatment and after-care desirable. This in fact is already happening. The surgeon-in-charge of a Fracture Clinic inaugurated at the beginning of 1937 (Mansfield and District General Hospital) reports:—"At first it was thought that the clinic could be strictly confined to fracture cases, but in actual practice it proved very difficult to exclude other cases arising as the result of accidents such as strains, dislocations, internal abdominal injuries, head injuries, severe lacerations and many other conditions. . . . In my opinion the treatment of a severe muscular or ligamentous sprain is often more difficult and liable to result in more permanent disability than many cases of fracture in the same vicinity."

Sir John Fraser, giving evidence on behalf of the Royal College of Surgeons, Edinburgh, considered that, from the point of view of rehabilitation, there were three types of injury which demanded particular consideration, viz., fractures (including dislocations), injuries of the back and wounds of the hands complicated by sepsis. These three classes, he said, formed the bulk of industrial accidents, and in each of them there is not only the problem of immediate treatment but also the equally important consideration of after-care, remedial treatment and occupational therapy. He contemplated that all would be brought within the sphere of the clinic, and in reply to a question said that, once a fracture clinic was established, he thought it would develop automatically in this direction.

We may note that a general Traumatic Clinic has already been established at one London hospital (the West London) which takes all cases of injury, with certain exceptions such as injuries involving the viscera of the chest and abdomen. During the first eight months of its existence (1st November, 1937—30th June, 1938) the Clinic dealt with 6,417 injuries of which 894 were fractures and dislocations.

We do not wish to express any dissent from the view that a Fracture Service is capable of extension to include other classes of injury and that such extension is desirable. It will be seen

later that we regard certain of our proposals as applicable to other classes besides fractures. Dr. Böhler's Hospital in Vienna is a notable example of a general Injury Service.

The most important and most urgent need at present, however, is the provision of services for the treatment of fractures and our recommendations bear, mainly though not entirely, on the steps necessary to secure this. There are cogent reasons of a practical character for this. The rapid provision of Fracture Services will depend largely on local effort, and will entail a good deal of planning and negotiation between the different interests involved, and also some expenditure. It is desirable therefore that the problem should be put to them in its simplest form, confined to the treatment of fractures and uncomplicated by any wider issues. Advance towards the wider conception of a traumatic unit (if found desirable) is more likely to take place in this way by a process of development than by pressing the conception at once upon the local government and hospital authorities. The question of the provision of Fracture Services has now become familiar to the country, the wider question has not; and to put forward and press the wider question now would, we are afraid, hold up the institution of Fracture Services indefinitely.

We shall have something more to say with regard to injuries other than fractures in a later chapter of this Report (Chapter XII).

V. THE CASE FOR ORGANISED FRACTURE SERVICES.

As stated in our Interim Report, the modern treatment of fractures is based on certain principles of organisation and treatment. The principles of *organisation* may be summarised as concentration of cases in one department under single control, continuity of treatment and supervision by that department until restoration of working capacity has been effected to the fullest possible extent, and a system of records of cases which will permit the history of each case to be followed from start to finish, and the final results ascertained. The principles of *treatment* aim at securing in every case exact reduction of the fracture, fixation in correct position and immobilisation of the broken part, and active movement from the earliest possible moment of the uninjured parts of the limb to prevent wastage of muscles and stiffness of joints. We were given to understand at the time of our appointment that these principles were accepted by the Government Departments concerned and that the object in view was the provision throughout the country of fracture services, based on those principles, which would place within the reach of every injured person the benefits of the improved methods, with the threefold result of mitigating suffering, reducing the period of disablement and the loss of working and earning power, and securing wherever possible complete restoration of working capacity. It is now nearly two years since that Interim Report was issued. It seemed at that time that a widespread movement for the establishment of Fracture Services had begun and was likely to make rapid headway, and it is disappointing to have to report that, in spite of the acceptance of those principles by the leading representative bodies, progress in the general application of them has not been as rapid as we hoped. The matter has been taken up in a number of places by the local government authority, by the authorities of individual hospitals, by industrial leaders and industrial organisations with offers of financial assistance, and by others; but though progress has been made the hope that a *general* movement had been started and would be carried through by the hospitals themselves, both voluntary and municipal, individually or in co-operation, has not been realised. And in more than one case where all the material conditions (accommodation, etc.) were favourable and a scheme was under consideration, the project has hung fire for some reason. One reason no doubt is unwillingness on the part of hospital authorities engaged in a perpetual struggle to raise money and make ends meet to contemplate any new scheme involving fresh expenditure. There is unfortunately also reason to think that in some cases the personal views of members of the visiting staff of hospitals have been one of the hindrances, and we repeat what we said two years ago that the proved advantages of unified control are so

great that the interests of individual members of the staff should give way to the general interests of the community.

We think it desirable therefore to set out briefly, in this Chapter, the case for the establishment of Fracture Services on modern lines, and in the first place we wish to emphasise that this is a matter of general public interest. A good deal of our Report is concerned with the relations of the question to industrial accidents, but as pointed out in an earlier Chapter, industrial cases form, at most, not more than one-third of the total number of fracture cases treated in our hospitals. If public opinion is aroused as to the need for a change of system and demands it, the hospitals which depend on public support may be expected to listen.

We also want to make it clear at the outset that it is not—or not to an important extent—the *methods of treatment* that are in question. Though, as we shall emphasise in a later part of our Report, the training of medical students in fracture treatment is very far from satisfactory in a great many cases, and there is a great deal of leeway to make up in respect of actual surgical practice, competent surgical opinion generally is not divided on the appropriate methods of treatment; and in particular the old method of treatment by which the whole limb was immobilised, may be regarded as having gone for good. It is, in the main, the organisation of the hospital services for the treatment of fractures which has been, and in many cases still is, defective and in which a radical change is needed.

What have been the characteristics of the system up till now? The following account, which appeared a year or two ago in the report of an important provincial hospital, is a fairly accurate description of the general practice:—

“ Ordinary fractures are seen by the Casualty Officer in the Out-Patient Department of a General Hospital. They may be reviewed by the Resident Medical Officer or in more serious cases by the Visiting Surgeon on his day. If afterwards admitted to the Wards they are taken in on the day of the Visiting Surgeon in attendance who may not previously have seen the case. After the operation the patient is seen daily by the House Surgeon and possibly a time or two by the Surgeon who operated. After discharge the patient is directed to attend the Massage Department where he is generally under the care of a doctor who has not seen him before.”

Under such a system it is a matter of chance whether the patient comes under the care of a surgeon who is interested and experienced in the treatment of fractures and allied injuries or of one who is not; the nursing staff who will attend to him have to deal with cases of all kinds and have not the specialised training and amount of practice required for handling fracture

cases; when he leaves the ward the supervision of his case tends to become haphazard, and as there is no adequate system of following the case in its later stages no one—at any rate no one on the surgical staff—knows the end result of the case and whether the rehabilitation has been complete. It is little wonder that under such a system it is not uncommon to find, on the one hand, cases of defective surgical treatment resulting in mal-united and non-united fractures and, on the other hand, cases where, as a result of the want of after-care in the later stages, the patient fails to make progress and gradually drifts into more or less permanent incapacity.

A surgeon formerly in charge of the fracture centre of a London General (War) Hospital, and with nearly 20 years post-war experience of athletic or "sports" injuries in a University town, comprising a very large number of cases, writes:—

" Anyone interested in fracture work must be appalled from time to time by the cases he sees in which fragments have never been properly reduced and where after prolonged disuse and long-continued massage a high percentage of permanent disability results . . . considerable experience in fracture work is necessary for the assurance of uniformly good results and the avoidance of risks in the early stages when much swelling is present.

" The orthodox treatment, or masterly inactivity, of a quarter of a century ago is still employed to-day in many places."

and again—

" The basic requirements . . . of accurate reduction, fixation, and function, are not satisfied by most of the splints whose employment was a standard routine in hospitals until the last few years and which are still in current use in a great many cases.

" In modern treatment (of fractures of the leg) the saving in sick wastage and hospitalisation is nothing short of dramatic, and function replaces the usual dreary and expensive ritual of months of physiotherapy."

In a Fracture Clinic organised on the lines we have indicated, the patient, whether as an in-patient or an out-patient, comes from the beginning under the care of a staff which has concentrated on, and perfected its technique in, the treatment of such cases; and remains under the supervision of that staff throughout; the progress of the case through all its stages being carefully noted and recorded until rehabilitation is complete or, in default of that, a stable condition reached.

In the Interim Report we said that we believed that the scheme which we had drawn up and presented in that Report for the organisation of Fracture Services on these lines throughout the country represented the views, and had the support, of a large body of medical opinion in this country.

That belief has been amply confirmed both by the reception accorded to the Report, and by almost all the evidence we have subsequently received.

Apart from some points of detail, no criticism of the scheme has reached us from any important medical centre (with one exception to which we shall refer presently), nor have we noticed any such in the medical press. On the contrary, the principles on which the scheme is based have received the emphatic approval of the representative surgical bodies of the country.

Important and suggestive evidence, which has been of great assistance, was given by both the Royal Colleges of Surgeons, England and Edinburgh. It will be sufficient to quote one or two passages. The views of the Royal College of Surgeons of England were presented to us by the President, Sir Cuthbert Wallace, Professor Grey Turner, Vice-President (Professor of Surgery in the University of London), and Professor Barling (Professor of Surgery in the University of Birmingham). Sir Cuthbert Wallace in his evidence pointed out that the tendency to specialise in surgery has been growing, especially since the war, and will continue, and proceeded:

“ Q. You agree with the conception that the treatment of a fracture should be carried through by one individual, or one group of individuals, from start to finish? A. I agree.

Q. You also consider that it involves some segregation of these cases into a special department?—A. Yes.

Q. You consider that segregation is in the interests both of the patient and the student?—A. With the proviso that the student is part of the system.

Professor Grey Turner said:—

“ During the many years I was associated with the teaching of under-graduate students I realised that several of the surgeons were so interested in other problems that the Fractures were left more or less to the Junior Assistants or even to the House Surgeons ”.

Professor Barling told us that “ modern methods of fracture treatment call for specialist training in these methods and are not (as were older methods) within the competence of a general surgeon unless he has special interest in such cases. Many surgeons, with the main work of their unit devoted to some

speciality, take little or no interest in fracture cases admitted to their wards". He went on to say that "some of the most difficult problems you have in surgery are connected with fractures" and that it is not possible when you take a fracture in hand to say whether that fracture is going to involve special difficulties or not.

We may add here that The Council of the British Hospitals Association which, on the institution of the present inquiry, set up a special committee to prepare evidence to be given before us on their behalf, have in their evidence expressed their general agreement with the principles of the scheme, and made a number of valuable suggestions for promoting its general adoption.

The Royal College of Surgeons of Edinburgh informed us through the representatives they appointed to meet us (Sir John Fraser, Mr. W. J. Stuart and Mr. J. W. Struthers) that "the work and thought of recent years have marshalled a considerable body of criticism against both the system (under which fractures demanding in-patient treatment are admitted to the general surgical charges) and the results", and summarised for us those criticisms which from personal experience they believed to be the most important. We give this summary in full:—

(1) The practice of admitting fracture cases to general surgical wards on 'waiting days' implies that their admission coincides with the advent of acute cases, many of which may be of an urgent character. Under such conditions fractures are apt to receive less specific and individual attention than would otherwise be the case.

(2) The work of the average general surgical ward is sometimes so heavy that it is difficult to find time and opportunity for the detailed care of fracture cases.

(3) The degree of individual interest in fractures varies, and there are situations in which this class of case is unwelcome in general surgical wards. It is obvious that such a possibility might react adversely upon the results.

(4) In a hospital comprising a number of general surgical charges a uniform fracture admission system implies the duplication of material and equipment, with the result that for economic reasons the standard of equipment is likely to be reduced.

(5) The criticism of duplication is equally applicable in matters of clerical assistance, case records and follow-up control. These are important considerations in the care of fracture cases, and to add this detail to the clerical and record system of a general surgical ward implies considerable additional burdens.

(6) X-ray facilities are apt to be inadequate; much of the work has to be accomplished by a mobile unit, and a multiplicity of demands from different charges is so time-consuming that it may be impossible to render adequate service within a reasonable time. There is a similar criticism in respect of the radiographic personnel.

(7) While massage and physiotherapeutic facilities are available the opportunities for occupational therapy are restricted, in fact there is comparatively little organised effort directed towards early rehabilitation of the patient. After-care difficulties are particularly evident in the case of country patients. Owing to the demand on hospital accommodation fracture cases cannot be retained in hospital over the period devoted to remedial treatment, and much of it has therefore to be carried through on an out-patient basis. When patients are resident at a distance from the hospital many difficulties arise, and there is no doubt that results are thereby prejudiced.

They submitted the following conclusions:—

1. We believe there is room for improvement in the results following industrial accidents, particularly in respect of the time period in which rehabilitation is secured and the completeness of the recovery.

2. We believe that fracture results will be improved by the establishment of organised clinics in connection with existing hospitals.

3. We recommend that greater attention be paid to the system of after-care and follow-up of injured persons.

4. We urge the development of occupational centres in association with hospitals, because we believe that this provision is essential for early and satisfactory results.

In his examination, Sir John Fraser especially stressed the importance of after-care treatment. "These people", he said, "require a lot of encouragement mentally and yet they demand a considerable knowledge of the surgical aspects of the question in case damage is done by imperfect or improper exercises. Most of us can treat fractures and get them into a reasonable position and the bone joins . . . but it is the after-care that is so important . . . Now that calls for very expert care. I think it is much more difficult than the original treatment of the fracture". We shall return to his evidence in this matter later.

We have noticed that the late Sir David Wilkie, Professor of Surgery in the University of Edinburgh, in an address (reported in the *British Medical Journal* of 4th September, 1937) expressed similar views. "Whatever views" he said, "we may hold as to who should treat fractures, it will almost inevitably tend to become more and more the perquisite of the orthopaedist."

We have quoted the views of the Scottish representative body at some length because the only important medical evidence in criticism of the scheme in our Interim Report which was tendered to us came from a group of senior surgeons attached to two large teaching hospitals in Glasgow who claimed that conditions in hospitals in Scotland as regards organisation of the work, as regards arrangements for the instruction of students, and in other ways, differed markedly from those in England. While admitting the principle of continuity of treatment (which they said was already secured under their system) and admitting—and indeed stressing—the importance of after-care and the great room for improvement in that respect, they strenuously opposed the principle of segregating fractures in a separate department; it would in their opinion entail “an inevitable loss of healthy rivalry between the surgical members of the staff,” result in methods of treatment becoming stereotyped and hinder progress, and detrimentally affect the instruction of medical students. Under the system in operation in the particular hospitals for which they spoke the surgical work generally is organised in separate “surgical services,” each service consisting of the visiting surgeon and several assistant surgeons, who work as a team and are at the hospital every day.

We have no desire to question the possibility that such a system, worked by competent men, may give good *surgical* results (they considered that when the bone was joined and the joint functioning their task was finished) but we cannot assent to the proposition which they submitted in justification of their system that all persons deserving of the name of surgeon should be regarded as equally competent to deal with fractures.

The evidence is all the other way: and it seems common sense to suppose that a surgeon who devotes himself to a particular branch of surgery will (other things being equal) have the advantage in that branch, from wider experience and more constant practice, over a surgeon who does not. The diffusion of interest in a general ward which the witnesses claimed as an advantage in their system is, from another aspect, a very evident disadvantage. The witnesses in fact admitted to some degree the need for specialisation and emphasised the importance of sending fracture cases from districts outside the large towns into such central organised clinics as their own.

And what we have said about the surgical staff applies also to the nursing and auxiliary staff: a fracture clinic has the great advantage of a unified staff, specially trained and experienced in dealing with fracture cases.

If the treatment of fractures is not organised it is often impossible for the surgeon in charge of the case, with the best will in the world, to treat it properly. For example, the actual preparation of plaster bandages and the moistening of dry plaster

requires experience if wet plaster of suitable consistency is to be produced; the application of plaster bandages and of liquid plaster requires the observation of certain rules if it is to set hard without cracks. The patient must be under the observation of persons who are used to looking for the signs that all is not well. The active movements of the patient need controlling and observing by people who are familiar with what should be done.

Further, it must be obvious that an effective after-care and follow-up system must be much more difficult to arrange when a hospital has several fracture services instead of one.

There is, however, another side to the question. If, as is claimed, the establishment of fracture services on the lines indicated in our Interim Report will result in a shortening of the period of disablement and help to secure the utmost possible restoration of working capacity, it is evident that the industries of the country, which supply a considerable proportion of the fracture cases that occur, have a special interest in the provision of such services. And as the general provision of effective services throughout the country will be greatly facilitated and expedited if the representative industrial organisations, of employers and workers alike, give their support to, and use their influence in furthering, their establishment, we approached the National Confederation of Employers' Organisations and the Trade Union Congress General Council. Both bodies were good enough to send representatives to confer with us.

The National Confederation assured us of their interest not merely on the ground of the financial benefits that might accrue from a shortening of the periods of disability due to industrial accidents but on broader general grounds. No one will question the value of the support which is given by those connected with industry to the maintenance of the voluntary hospitals of the country. The Confederation's representatives felt, however, that the case for the re-organisation of fracture services in the hospitals had not been fully proved, that the matter was still in the experimental stage, and that while some employers and employers' organisations were already taking a great interest in it and had initiated arrangements with hospitals for the creation of fracture clinics, something more was needed in the way of demonstration of the superiority of the results under the "Fracture Service" scheme before an approach could be made to industrial employers in general for their support. They suggested that comparative statistics should be collected by the Committee on a wider basis from the hospitals of the results obtained under the old and the new systems respectively.

No doubt such a comparison, if it could be made, might be convincing in one direction or the other. Unfortunately the data are not available. The voluntary hospitals, in general, have kept no records of the cases treated which show the length

of the period of treatment and the final result; nor in the absence of a follow-up system, such as forms part of the organisation of a Fracture Service, would they be able to do so, even if they wished. Many hospitals have found it a matter of great difficulty to extract from the hospital records even the bare number of the fracture cases treated, in reply to the Committee's request for that information.*

It has also been suggested that the records of Insurance Societies which undertake Workmen's Compensation Insurance might be drawn upon but, at best, these could only yield partial information. They have no exact knowledge of the patients' final condition, and in the numerous cases which are settled by lump sum payments the Insurance Society has no further concern or interest in the case. Interesting information might be forthcoming, as is shown by the analysis which Mr. H. E. Griffiths, the Surgeon of the Albert Dock Hospital, has made of a very large number of cases in his book on "Injury and Incapacity"—but they would not yield the exact statistical comparison which the Confederation desired.

A certain amount of direct evidence, however, is already accumulating from hospitals where Fracture Services have been established recently, and that evidence is uniformly favourable.

The Chairman of the Medical Committee of St. Mary's Hospital, Paddington, London, says:—

"The unanimous opinion of the Committee, based on impression, is that the results of the treatment of fractures at the Hospital are much more satisfactory since the inauguration of the Fracture Clinic: this view was endorsed by the Radiologist who has, perhaps, better data on which to form his opinion than the other members of the Committee."

The Chesterfield and North Derbyshire Royal Hospital reports:—

"It was soon obvious that this (i.e. the new system) was resulting in a shorter stay in hospital, a shorter period as an out-patient, a more satisfied patient, and a much better functional result."

* The surgeon-in-charge of a recently established Fracture Clinic (Mansfield) points out that in considering average disability periods "it should be remembered that other factors apart from the work of the Fracture Clinic can affect this period"; that "many cases appear to spend long periods off work after they have been discharged from the clinic," in many cases when the condition on discharge was considered quite satisfactory by the surgeon; and consequently that the disability period of a fracture as assessed by the surgeon on clinical grounds may be an entirely different thing from the disability period when worked out from the point of view of actual return to work. Comparison is only possible not only if data are available but also if they are compiled on the same basis.

The Ashington Coal Company, Limited, which was instrumental in securing the organisation of a Fracture Clinic at Ashington Hospital says:—

“ We have every reason to be pleased with the results which the Fracture Clinic has shown.”

During the 18 months the Clinic had been in existence 302 cases of fracture or dislocation among the mine workers had been treated and almost every kind of injury. Where comparable figures were available for the years 1930-4, the results showed a diminution, sometimes considerable, in the average period of disability.

The East Suffolk and District Hospital have found that by treating Fracture cases in an organised clinic the period of disablement has been reduced.

A Consulting Surgeon of the King George's Hospital, Ilford, has informed us:—

“ It is my personal opinion that such special arrangements as we had in this hospital for fracture treatment do not involve any additional cost, as we find the period of hospital attendance of each case is very materially reduced.”

The Bootle General Hospital (1936), reports:—

“ The work of the fracture clinic has grown enormously and the results obtained by the new arrangements are excellent. This hospital is situated in a densely populated dock area and on a main road; so accidents involving fractures are frequent, and the hospital fracture department is a great boon not only to patients but also to the hospital.”

Peterborough and District Memorial Hospital (7th August, 1936), says:—

“ We find the effect most satisfactory from the point of view of the organisation and for the patients, and certainly progress is much faster and the period of incapacity is considerably shorter.”

The London Brick Company, writing on the 14th September, 1937, as regards cases treated under the arrangements at Peterborough, said:—

“ It is yet somewhat early to give any concrete information as to results, but I would say this, we can very materially reduce the period of incapacity.”

Clayton Hospital and Wakefield General Dispensary, says:—

“ Our method of organisation has given good results so far and the expenditure incurred is more than balanced by the fact that so many cases are now treated as out-patients who in the past were admitted and remained as in-patients for long periods.”

General Infirmary, Leeds (17th July, 1936), states:—

“ There is no doubt that since fracture cases were segregated five years ago and treated by a special staff, better results have been obtained and the period of incapacity shortened.”

The British Hospitals Association in their evidence said:—

“ The general experience in the new Fracture Clinics organised by the larger general hospitals throughout the country in key positions reveals . . . that the average stay of these cases in hospital has been considerably reduced.”

We would also call attention to the following important paragraph in the recently issued Report of the Royal Commission on Safety in Coal Mines:—

“ We have regarded the treatment of colliery accident cases after they leave the colliery and cease to be under the manager's control as rather outside our terms of reference, but Dr. Fisher drew our attention to the suggestion that ‘ fracture clinics ’ should be established at suitable centres in the mining areas for dealing with fracture cases from collieries on the specialised lines originally devised by Dr. Böhler of Vienna. Dr. Fisher had been much impressed by cases he had seen under treatment in this manner: ‘ The fracture is diagnosed with exactness in the first place, it is put up with accuracy in the second place, and it is supervised with great care in the third place The results are in favour of everybody concerned, the person gets a better result and he is at work at an earlier period It is especially marked in cases of fracture of the spine.’ He urged that these clinics should be strongly encouraged. One of the witnesses for the Institution of Mining Engineers, Captain S. Walton-Brown, also mentioned the subject in his written statement and in his oral evidence expressed views favourable to the establishment of fracture clinics. Action has already been taken by the industry in some coalfields to establish such clinics, and is contemplated in others (Walton-Brown). As the whole subject is being exhaustively investigated by an inter-departmental committee appointed by the Secretary of State for Home Affairs, the Minister of Health and the Secretary of State for Scotland to consider the rehabilitation of persons injured by accident, of which committee one of our number is Chairman, we have contented ourselves with bringing these views to the notice of the committee.”

We may add that the surgeon in charge of a Fracture Clinic which has been established in the Midlands has expressed the view that there are a considerable number of cases in that coalfield which are capable of being restored to full work, but who, owing to the absence in the past of facilities for treatment to a conclusion, have remained on compensation for partial incapacity for prolonged periods.

He is of opinion that every colliery in the area could produce examples of men only capable of light work who need not have remained in that condition; and that the burdening of the industry with an accumulation of cases of this kind during the last fifty years is one of the principal reasons for the existing high costs of compensation.

We have quoted these reports in the hope that they will encourage the doubtful and help forward the movement which has already made progress since our inquiry began, but we do not think they are needed to prove the case for the establishment of Fracture Services. It seems to us to be axiomatic that if, as the best surgical opinion holds, they represent an improvement on the old system, better results must follow, the period of disability will be shortened and the number of cases of permanent disablement reduced.

In conclusion, we may recall that the principles underlying the scheme we have submitted are the principles on which Sir Robert Jones based the great work that he did during and after the war in the treatment of war casualties; they are also the principles on which the well-known clinic of Dr Böhler in Vienna, which has had so remarkable an influence, is worked.

It was Sir Robert Jones' recorded opinion that "a great defect in our large general hospitals is the system whereby a surgeon is expected to treat equally well cases in regard to which he is an acknowledged master and cases which do not interest him in the least. There is an urgent call to remedy this dangerous defect"*. As regards the nursing staff, he refers to the importance of having nurses with "a thorough knowledge of the highly specialised work of splinting, application of plaster massage and electrical treatment"†.

As regards Dr. Böhler's work, so much has been written about it, and it is now so well known, that it is unnecessary for us to refer to it in any detail.

We may quote from Dr. Böhler's work on the Treatment of Fractures* one passage significant of the new attitude:—

"In order to be informed of the after-history of cases of fracture, I have followed up all my own cases treated since 1916, according to set forms suitable for the different bones, and by means of these, information is obtained of all cases which have not fully recovered. Every year an attempt is regularly made to find out by means of these forms which accidents have left lasting disabilities. In this way it has been possible to detect many unsatisfactory methods of treatment and arrangements of appliances."

Finally, the opinion of the American College of Surgeons coincides with that of the Colleges of England and Edinburgh. They have recommended that one individual surgeon should be responsible for the supervision of fracture cases in each hospital.

* Life of Sir Robert Jones, by Frederick Watson, (London, 1934), p. 222.

† *Ibid.*, p. 241.

‡ Fourth English Edition, page 565.

VI.—THE ORGANISATION AND FUNCTIONS OF A FRACTURE DEPARTMENT*

We now come to the main question of the organization and functions of a Fracture Department. This was dealt with provisionally in our Interim Report, and as we have already stated, we have received little criticism of the outline there given: on the contrary, it has been very generally approved by surgical and hospital opinion.

On a consideration of all the evidence we have taken, we see no reason to modify, in any important particular, what we said in the Interim Report: and in this Chapter we submit a fuller and more complete presentation of our proposals.

It will help to an appreciation of our proposals if we preface it with a brief review of modern developments in the treatment of fractures which has been prepared by the surgical members of the Committee.

(a) Modern Developments in the Treatment of Fractures

During the last 50 years the treatment of fractures has passed through a series of stages so remarkable that without some knowledge of their nature it is scarcely possible to appreciate the methods at present employed or to assess at their true value the results which may be obtained. Fifty years ago a fracture usually involved prolonged fixation in irksome splints, and was only too frequently followed by some permanent disability. Today, it is axiomatic that active use of the limb commences at the earliest possible moment, such splints as are used aim at support and not restraint, and it is by no means uncommon for a patient with a fractured ankle to walk out of the fracture department in which he has been treated on the day of the injury.

The old method of treatment cannot be better expressed than in the surgical dictum which was still impressed upon medical students 30 years ago, "Fix the joints above and below the fracture." In the case, for example, of an elderly woman with a fracture of the thigh this meant that she was tied to a long wooden splint, from the foot to the armpit, for two months. Even if she survived she was permanently crippled with a fixed hip and knee. But in every case the inevitable results of the

* In this chapter we use for the sake of clearness the term 'Fracture Department' to denote a Hospital Fracture Service organized on the lines set out in the report, and the term 'Fracture Clinic' to denote the 'sessions' held by the staff of the Department (daily, weekly, or other) at which the ambulant cases are examined and treated. The term 'Fracture Clinic' has been used in our Interim Report and in other publications to denote the organized service as a whole, and by this time has found its way, in this sense, into popular usage. In general, the context will make it clear in which sense the term is used in this Report.

methods were wasting of the muscles and stiffness of the joints, whilst the poor circulation of the blood in the motionless limb tended to retard the bone union which it was the object of the method to achieve.

The immense success of aseptic surgery directed the efforts of surgeons towards the abdomen, and interest in fractures waned. The pioneer work of a number of eminent surgeons showed, however, that aseptic methods could be applied to this field also, and a period began in which open operation was regarded as the method of choice. The fractured bones were exposed by a cutting operation, accurately replaced, and secured in position by screws, plates, or wires applied directly to the bones under visual control. At a later date, after bony union had occurred, the pieces of metal might be removed by a second operation. The technical difficulties and the skill required, however, limited the method to a few centres, and it was impossible that its application would ever become general. The work done by these pioneers had, nevertheless, a permanent value in that it taught the possibility and the great importance of accurate replacement of the bony fragments, and the value of the early movement of the joints which was rendered possible by the mechanical fixation of the bones.

At an earlier date X-rays had been discovered and it became possible to see the precise nature of the injury to the bone and the degree of success achieved in replacing the fragments in their normal relation. It was soon realised that this procedure, which is usually called the "setting" or "reduction" of the fracture, was a much more difficult problem than had formerly been thought, and that much of the disability following on fractures was due to their imperfect reduction. The introduction of X-rays marks an epoch in the treatment of fractures, but it would be a great mistake to imagine that they can replace clinical examination and experience.

Surgeons classify fractures into *simple fractures*, in which there is no communication between the site of injury and the surface of the body, and *compound fractures*, in which there is a communication with the surface through an open wound. Compound fractures are prone to become septic; this may delay union, or it may cause so much loss of bone that union is impossible, or it may even necessitate amputation of the limb.

In the Great War surgeons were faced with the problem of handling huge numbers of compound fractures in which, quite frequently, a large wound and gross sepsis increased the difficulties enormously. Before the war such severe and septic injuries almost invariably meant the amputation of the limb, and very often the death of the patient. Experience showed, however,

that adequate support of the limb could be effected, with little inconvenience to the patient, by using apparatus which maintained a continuous pull on the part of the limb below the break. By this means the muscles of the broken limb were put at rest and relaxed, pain was relieved, the broken bone-ends could be brought together and the bones kept in line. Under these conditions healing and union could usually be obtained without undue difficulty. Ingenious methods were devised which held the bone securely in alignment whilst the joints were left free for active movement, so that the strength of the muscles and the circulation of the blood were maintained. As a result the union of the bone was obtained with little loss of function in the limb, convalescence was greatly shortened, and the final disability reduced to a minimum.

It was, however, some time before these lessons were generally applied to the simple fractures occurring in civil life, and indeed, it is only in recent years that their true meaning and value have been appreciated. In the modern treatment of fractures the principles involved are extremely simple, although their application may call for the highest skill and ingenuity. They are three in number. The first is accurate reduction of the deformity, or "setting" the fracture, so that the bone fragments are fitted together as accurately as may be possible. The second is support of the limb in such a way that the fragments are immobilised but movement of the rest of the limb is as free as possible. The third consists in *active* use of the injured limb from the earliest moment and to the fullest extent, the security of the fracture being always maintained.

In accordance with these principles the treatment of a fracture passes through three stages, in each of which competent handling is essential if ultimate success is to be achieved.

Reduction (Setting).—It is now quite generally conceded that accurate restoration of the bone fragments to their normal relationship is of great importance, and that it can be achieved with a high degree of precision under radiographic control. Failure to obtain accurate replacement is one of the most important causes of prolonged or even permanent disability, and it is, therefore, of vital importance that every fracture should be under expert control from the outset if satisfactory results are to be obtained. The maintenance of correct apposition of the bone fragments requires apparatus constructed of plaster of Paris and other material by assistants possessing a skilled technique, in a definite department furnished with special modern appliances. The difficulty of effecting reduction may be increased by delay or by unskilled handling. If there is much delay the processes of repair commence, and after about a week it may be impossible to reduce the fracture by any means short

of open operation. Moreover, inexperienced handling in the early stages may not only make reduction more difficult but may involve injury to nerves and other important structures.

Immobilisation.—Of equal importance is the maintenance of the correct position once it has been obtained, and this can only be achieved by constant supervision and by X-ray examination at intervals up to about a month after the reduction. After that time actual slipping of the fragments is less likely to occur, but if the limb is not properly supported so that the injured part is relieved of all strain angular deformity may develop and lead to serious disability.

Functional Re-education.—Early active movement of the uninjured joints and muscles is one secret of the success of modern methods. In many cases the limb can be so supported that the patient can himself use it in an almost normal manner, using his hand and fingers, for example, with a fractured wrist or walking with a fractured ankle, long before bony consolidation has even begun. In this way the blood supply and nutrition of the muscles is maintained and the formation of adhesions around the tendons and in the joints is prevented.

Neglect of this vital principle accounts for much of the prolonged disability which has followed fractures, but skill and judgment are required in directing the patient to those movements which he can perform to the greatest advantage and this can far more easily be achieved in an organised clinic. It is not merely a question of modern equipment and the services of an expert staff, valuable though these may be. Only those who have handled these cases in large numbers can appreciate the value of mass suggestion, or the stimulus of seeing recovery in others with similar injuries.

The importance of maintaining the patient's morale can hardly be exaggerated. The patient's mind is naturally impressed by the powerlessness of his fractured limb. The sooner, and the more, he moves the uninjured parts of the limb, the more quickly his confidence in his own powers will be restored.

(b) *General Organization of a Fracture Department.**

The object to be aimed at is to bring all cases into a single department under a unified and specialised control and to ensure that the treatment continues under the same supervision until the process of rehabilitation, i.e., restoration of working capacity, is complete or has been effected to the fullest possible extent. An integral part of the service will be a system of records of cases which will permit the history of each case to be followed from start to finish and the final results ascertained.

* We deal with the second stage of the treatment, that is, restoration of functional activity by physio-therapy and remedial exercises, in the next sub-section.

The department should be placed, as a general rule, under the charge of a visiting surgeon *who has given special attention to this branch of surgery*, and he should have associated with him one or more whole-time assistant surgical officers, according to the number of cases treated.

Provision should be made for an X-ray technician to be available at any time day or night, so that there may be no delay in the X-ray examination by which alone the treatment of fractures can be accurately controlled. A specially trained nursing staff is also essential.

The standard of work of a Fracture Department will depend primarily upon the detailed supervision and the personal direction of the treatment of cases by the surgeon-in-charge. The surgeons assisting, whether holding the position of registrars (or chief assistants) or house surgeons, will not be permanent members of the staff; and it will devolve upon the surgeon-in-charge to train and supervise a succession of such men. This will involve the surgeon-in-charge giving frequent attendance at the Department and a considerable part of his time.

Staff.—The following are given as approximate estimates, based on the experience of existing fracture departments, of the special staff that would be required for different types of clinics and the cost of such staff:—

1. The Fracture Department in a city hospital of 500 to 1,000 beds dealing with 2,000 to 2,500 fractures per annum would require

	£
Surgeon-in-charge; one of the visiting staff of the hospital who should, however, receive an honorarium for the special and onerous duties he would undertake	500
2 whole-time assistants of the standing of registrars (say) £400 and £200	600
Radiographic Service	250*
	and board
2 resident house surgeons (on the staff of the hospital).	
1 stenographer }	350
1 records clerk }	
Total cost of staff per annum	£1,700

Nursing and massage staff would be supplied by the hospital as part of its general services.

2. A hospital of 200 to 500 beds dealing with a proportionate number of fractures would require a similar staff but on a smaller scale. There would be required:—

	£
Surgeon-in-charge	300
1 whole-time assistant	300
2 resident house surgeons (on the staff of the hospital).	
Radiographic Service	250*
	and board
Clerical assistance	200
	<hr/>
Total cost of staff per annum	£1,050
	<hr/>

These two groups of hospitals will, as appears from the statistics given on pages 11-13, account for nearly half the total number of fractures treated annually.

3. In the case of hospitals ranging from 50 to 200 beds, it may not be practicable, at any rate immediately, to provide an entirely full-time staff; but in the larger of these institutions arrangements could be made to appoint a whole-time Registrar (desirably an F.R.C.S. with special training in fractures) to take charge of the fracture work in conjunction with the visiting staff, or alternatively to secure the services of a Visiting Consultant. It is estimated, if this is done, that the special salaries involved should not exceed from £400 to £600 per annum. The general organisation should, however, be on the same lines.

It will be seen that we suggest one departure from ordinary practice in respect of the remuneration of the surgeon-in-charge. It is not the custom for the visiting staff of a hospital to receive any remuneration for their services; and at teaching hospitals and other large general hospitals in cities, where fracture departments have already been established, the fracture department is controlled by an honorary surgeon or honorary orthopaedic surgeon as part of his honorary duties. At many hospitals, however, we apprehend that it may be difficult to secure the man best qualified for the work unless he receives some honorarium for his services.

As we have pointed out above, the surgeon-in-charge of the department, if a high standard of efficiency is to be maintained, will undertake much more onerous duties than those usually falling to a visiting surgeon and he will be called upon to give a considerable part of his time to them to the sacrifice of other and more remunerative work. It has, for example, been found necessary in certain provincial towns of medium size, to subsidise for

* This represents roughly the Fracture Department's proportion of the cost of the Hospital's Radiographic Service.

a few years a specialist surgeon whose prospects of establishing himself in private consulting practice would be otherwise precarious.*

Another question that has been raised is that of the relation of the fracture department in a hospital to the orthopaedic department of the hospital. In most of the hospitals which have already established fracture departments the department is closely associated with the orthopaedic department, the same surgeon being in charge of both. Such an arrangement has certain definite advantages, though it is not essential to the Committee's scheme. In any case, as the work of the two departments will in many respects be so closely related, it will be desirable that a close contact should be maintained between them.

Accommodation.—One result of the improved methods which is of great importance for the organisation of Fracture services is that many cases which would formerly have been retained in hospital as in-patient cases can now be dealt with wholly in the out-patient clinic as "ambulant" cases. The pressure on the hospital beds is diminished and the cost of treatment lessened.

Special wards should be assigned to the department to ensure fully efficient treatment of in-patient cases, because it is only under these conditions that the special personnel and equipment of the department can be constantly available to meet their needs. Where it may not be possible under existing conditions to set aside separate wards for the purpose, certain beds in the general wards should be definitely assigned to the fracture department as a temporary arrangement pending the provision of separate accommodation. More beds are needed for men than for women; small children are usually admitted to the children's surgical ward. The amount of in-patient accommodation required will vary somewhat according to the character of the area served. On the basis of the results which are being obtained in hospitals where the Fracture service has been organized on these lines, and as a rough approximation, a general hospital in a city with a mixed population may need from 15 to 20 beds for each thousand cases of fracture dealt with yearly. A hospital serving a population largely occupied in heavy industry (and likely to have a larger proportion of serious cases), or a hospital to which cases are referred from a large surrounding rural area, would require a higher proportion; while hospitals in residential areas might need less.

We would stress the importance of provision for the treatment of shock immediately on the arrival of the case at the hospital. The "shock room" is a special feature of the Fracture Clinic

* In such cases the local authorities in the neighbourhood have made agreements with the voluntary hospital for the treatment of cripples, the income accruing thereby enabling the voluntary hospital to subsidise the appointment of a surgeon, who treats both fracture patients and ordinary cripples.

at the new Albert Dock Hospital, to which great importance is attached by the surgeon-in-charge; and it may be of interest to quote the description we have been given of it:—

Shock Room.—In the shock room are mobilised all the methods of treating shock. The stretcher, on leaving the ambulance, passes straight on to the couch which may have either end raised or lowered. Balanced above the couch is a radiant heat bath in three sections with thermostat control which can be immediately pulled down over the patient. On five specially designed trolleys are sterile instruments covered with sterile towels of different colours. These are for (a) control of haemorrhage, (b) intravenous transfusion, (c) blood-grouping apparatus including microscope, (d) blood-collecting apparatus, (e) drugs with sterile syringes, etc. There is a sixth trolley which is the dirty trolley with tools for removing boots, clothing, etc. There is also a cubicle with couch for the blood donor. The shock room is kept at 80 degrees (F.).

For out-patient treatment the following accommodation, most of which can be found in the usual hospital out-patient department, will be needed:—

- (a) Reception room.—For preliminary removal of clothes, cleansing, examination and note-taking.
- (b) Operating theatre, such as is used for minor surgery in an out-patient department, including Plaster Room.
- (c) A room suitable for holding the daily and weekly clinics.
- (d) An X-ray department, which should possess a portable set.
- (e) Accommodation for physio-therapy and remedial exercises.
- (f) Clerks' room with records.
- (g) The usual number of casualty beds (4-5) should be available for cases which it is desirable to keep under observation for a day or two, and for those suffering from shock (if there is no special shock-room).
- (h) Storage for splints, general surgical stores and instruments.
- (i) Staff accommodation.

In Appendix Q we give by way of illustration plans of two recently erected Fracture Out-patient Departments.

(c) *Routine of a Fracture Department.*

We append to this chapter a note (Appendix F) sketching out in some detail the normal routine of a Fracture Department.

(d) *Restoration of Functional Activity.*

It is hardly possible to exaggerate the importance of this part of the work of the Fracture Department. The practice in the past, and not obsolete everywhere yet, under which it was left to the patient himself, after the surgical treatment was ended and union of the broken bone effected, to regain the full functional activity of the injured part by his own exertions, possibly with some assistance from the massage department of the hospital, resulted too often in a prolonged period of disability, in some cases a permanent loss of function. Mr. Elmslie, in an address to the conference of the British Hospitals Association in June, 1936, referred to this:—

“ There are still ”, he said, “ many hospitals which undertake the treatment of fractures which are either not equipped or are inadequately equipped for physical treatment, and there is insufficient follow-up to make sure that the patients really carry on with their physical treatment, until they are recovered from their injuries.”

In giving evidence he emphasized the importance of this “ after-care ”:

“ It is most important that the direction and supervision of physical treatment should be in the hands of the surgical team responsible for the fracture. One of the chief difficulties in the after-treatment of injuries is the failure of the patient to get back confidence either in the injured limb or in himself.”

Left to himself, without supervision or encouragement or the spirit of emulation which comes from exercises done in common with other patients, he tends to nurse the injured limb rather than exercise it, with the result that his condition remains static instead of improving.

All our evidence that touched on this question concurred in the importance of the matter.

Various methods are in use for bringing about the restoration of functional activity in the injured limb, which may be classified under the headings of (a) physio-therapy, (b) remedial exercises, (c) occupational therapy.

Physio-therapy in the sense in which it is used in the medical profession, is a branch of medical treatment, including, for example, the use of electricity for stimulating the muscles of the injured part. In one hospital which we visited, electrical treatment played a very important part in the after-treatment and probably in most hospitals it plays a part in some cases, and the necessary apparatus would be available.

Occupational therapy, as a means of restoring functional activity, was pressed upon us by some witnesses. Sir John Fraser urged that there should be attached to every hospital, or a group of hospitals, an occupational therapy centre at which there would be "a wide variety of work, gardening and outdoor work and carpentry and all sorts of things and the patient would be brought through the intermediate stage before he is able to resume full work." It will "give the man the encouragement of being able to see that he can do these things when he goes back to his work." Dr. Cunningham, the Superintendent of the Astley Ainslie Institution, Edinburgh, says that, in addition to its usefulness as a means of restoring physical function, "interesting employment which holds the patient's attention acts as a mental tonic and prevents introspective tendencies and the development of neuroses. It is essential" in his opinion "that it should be carried out by persons who have been specially trained for this type of work". Mr. Girdlestone, Clinical Director of the Wingfield-Morris Orthopaedic Hospital, and until recently Nuffield Professor of Orthopaedic Surgery in the University of Oxford, also advocated the provision of occupational therapy.

Occupational therapy, as is well known, formed an important part of the treatment of wounded men in the war. "Curative workshops" were instituted at the Shepherd's Bush Military Orthopaedic Hospital: "when the preliminary stages of operative and surgical treatment are over there is a steady graduation through massage and exercise to productive work which is commenced as soon as the man can really begin to use his limbs at all"*.

Occupational therapy on such lines is already carried on by one or two special institutions such as the Royal National Orthopaedic Hospital and the Astley Ainslie Institution; but it does not seem likely that arrangements for this could be made in the great majority of hospitals where fracture departments should be instituted: and Mr. Elmslie, who recognised, in his evidence on behalf of the British Orthopaedic Association, the value of occupational therapy, thought it would find a place in a rehabilitation centre if such were established, rather than in a hospital.

Remedial exercises.—Our attention, therefore, has been mainly directed to the provision to be made for remedial exercises, which must, in any case, form an important part of the after-treatment.

The ideal arrangement, no doubt, is that the Fracture Department should have its own arrangements, separate from the general arrangements of the hospital, for remedial exercises

* Life of Sir Robert Jones, pp. 167-8.

and physio-therapy. Dr. Moore of Crewe, whose experience in this field lends great weight to his advice, strongly advocates this; one of the surgical staff should, he thinks, look in every day to see what the patient is doing and how he is doing it and what progress he is making. And this ideal has been translated into fact at the Fracture Department of the new Albert Dock Hospital, belonging to the Seamen's Hospital Society, where (besides a small electro-therapeutic department) a large gymnasium is provided, with space enough for various games and exercises, some competitive; the "getting fit" is treated as a whole-time job for the patient who is required to attend during the day, is placed under the direction of a trainer subject to the supervision of the surgeon-in-charge, and is given his mid-day meal.

The more the restoration of working capacity can be carried out at the Clinic the better; the whole process of restoration remains under one and the same skilled control; the problem is simplified and the need for special arrangements outside the hospital lessened. Several of our witnesses expressed the view that if cases are treated in a properly organised and conducted Department there should be little need for any subsequent "re-conditioning" process. The Surgeon in charge of the Fracture Department of the Mansfield and District General Hospital, which serves a mining area, reports that out of 500 mining cases received in the first six months of 1938, 432 or 86 per cent. were able on leaving the Hospital to go back at once to their ordinary work, and 49 or 10 per cent. were cases which would probably be restored to full working capacity by a process of rehabilitation.

It is not to be expected that every hospital will be able at once to make provision on this scale, but the general principle that systematic and sustained exercises, of a progressive character and under proper control, are an essential part of the rehabilitation process can be applied with accommodation and equipment even of a simple and inexpensive character and we have seen excellent work being done in this way.

With adequate facilities for remedial exercises carried out under trained direction and with encouragement from the staff, there is good reason to hope that in a very large proportion of the cases, the Fracture Department will be able to treat the case to a conclusion and turn out the patient ready for his full-time work.

Where it is not found possible, owing to lack of accommodation or other reason, to provide the Fracture Department with separate arrangements for the purpose, and use has to be made of the hospital's general arrangements for physio-therapy and remedial exercises, it is essential that control of the treatment of the case remain in the hands of the surgeon in charge of the

Fracture Department. This is the point at which maintenance of continuity in the treatment is of the first importance. The surgeon-in-charge who has been treating the case during the first stage must direct or prescribe the treatment during the second and must be in a position to satisfy himself that it is being given and what effect it is having; equally the patient, if his co-operation is to be maintained, must feel that he is still under the care of the department and that the purpose is to see him through to the finish. The feeling of confidence and assurance that the surgeon and his assistants should be able to inspire in the patient is one of the most important factors in his recovery. If, therefore, use has to be made of the Hospital's general arrangements for physio-therapy and remedial exercises, either—

(a) sections of the hospital's main departments for physio-therapy and remedial exercises might be detached and placed under the control of the surgeon in charge of the fracture department, or, failing that,

(b) Members of the staff of these departments should attend the daily and weekly clinics of the fracture department, receive the fracture surgeon's prescriptions direct, and carry them out subsequently in those departments under the general supervision of the officer in charge.

The latter arrangement is the less satisfactory, and if it has to be adopted, the case should be examined frequently and regularly by the surgeon-in-charge that he may satisfy himself that the treatment is having the desired effect.

Difficulties in carrying through this part of the treatment arise when the patients have their homes at a considerable distance, as will happen in many cases which are brought to the Hospital from rural, or even suburban, areas. We consider these in a later part of our Report which deals with the arrangements generally that can be made for fracture cases among the residents in rural areas.

A patient may be capable of resuming full or partial work before full functional recovery of the injured part has been attained, and it may be advisable for him to do so; but treatment should be continued as if he were not working.

We deal with the question of "light work" more fully in Chapter VIII.

We may mention here the importance of adequate nutrition during the whole period of treatment. Mr. H. E. Griffiths, Surgeon to the Albert Dock Hospital, has remarked that "the out-patient departments of our hospitals are crowded with cases

of patients suffering from the combined disabilities of injury and under-nourishment ”.

The experience of the Medical Department of the Ministry of Pensions has shown the value of holding *evening* clinics for men who have returned to work but continue to require treatment. It was stated to us that:—

“ A large proportion of these cases find that by periodical attendance at these clinics they are able to keep at work. The cases are for the most part the result of gunshot wounds of limbs where repeated flares have resulted in a diminution of function either of muscle or of joints, and there is little doubt that massage and electrical treatment does enable certain men to remain at their work. A certain number of cases also of the rheumatic group attend for short periods of treatment at evening clinics while still working. Radiant heat and diathermy and other forms of electrical treatment are found to keep these men going ”.

The Ministry reports that these evening clinics have been found to be a great boon by the men, and though the circumstances are different from those we have to consider, it would seem that for men who are back on ‘light work’, for example, before their treatment is concluded and who might find it difficult to leave their work to attend a clinic in the daytime, the institution of an evening clinic in connection with the Fracture Department might be very helpful.

We are informed that it is the practice at the Royal National Orthopaedic Hospital to hold an evening clinic weekly for the examination and treatment of patients, and that the clinic is much appreciated by persons who are in employment during the day.

(d) *The Co-operation of General Practitioners.*

It is essential for the success of schemes for the treatment of fractures to secure the interest and help of general practitioners. We have no doubt that they will co-operate heartily with efficient schemes. As specialised hospital services have developed, general practitioners have referred their cases to them; we expect that they will similarly be ready to co-operate with fracture services. No doubt a small number of fractures will continue to be treated by general practitioners, but the number may be expected to decrease in proportion to the spread of fracture schemes.*

* The Hon. Surgeon in charge of the Fracture Dept. at the Wigan Royal Albert Edward Infirmary has furnished the following note as to its practice in this connexion:—I have encouraged local doctors to attend my Department to make them conversant with the treatment and care of splints, etc. This enables me to refer back to the doctors a number of minor fractures and know that proper supervision is being carried out. This co-operation works quite well and relieves the pressure on my Department without in any way interfering with its efficiency. It also encourages doctors to refer all fractures to me, knowing that by so doing the case does not necessarily pass out of their (the doctors’) hands.

The co-operation of the general practitioner will be of special importance when the patient lives at a considerable distance from the clinic and is unable or unwilling on grounds of expense or for other reasons to attend the out-patient clinic, and when arrangements cannot be made (as is being done in some cases)* to collect and transport him to the clinic. (See later as to the question of the cost of transport to the clinics, at the end of section (e) of this chapter.) In such cases the patient's medical attendant would be in the position to do good service by taking responsibility, in part, for the "after-care" of the patient, seeing that he carries out the instructions of the surgeon-in-charge and so forth. It would be necessary that a close liaison should exist between the clinic and the general practitioner and that the general practitioner should be fully informed as to the patient's condition and the nature of the after-treatment the clinic considers necessary, the responsibility remaining of course with the surgeon in charge of the clinic. The co-operation of the general practitioner, who is able to visit patients in their homes, will be of special value in cases where the patient, on account of family or other duties, finds it difficult to spare the time to leave home for attendance at the clinic. We have discussed this matter fully with the representatives of the British Medical Association who gave evidence, and they anticipated there would be no difficulty in securing the co-operation of the medical practitioner. And it may be added that the better the training the general practitioner has received in regard to fractures, whether in his student days or subsequently by refresher courses such as we suggest elsewhere, the more ready he will be to co-operate and the more efficient his co-operation.

We feel assured of the help of the Association in promoting such co-operation.

We anticipate therefore that general practitioners will share in the work of the diagnosis and treatment of fractures, as with other recognised specialities such as eye diseases, and diseases of the ear, nose and throat. The general practitioner will have the responsibility of diagnosing or suspecting the presence of a fracture; he will refer the case to the hospital to be dealt with in its special department; he will exercise general supervision over the patient who is living at home, and supervise or give such general or special treatment as is recommended by the surgeon in charge of the fracture clinic. In the intervals between the patient's regular visits to the hospital, he will refer the case to the clinic for special examination if he suspects that anything has gone wrong. In some cases where Cottage Hospitals are staffed by general practitioners they may find it convenient to see the patients there instead of at their homes. Thus the facilities afforded by these small hospitals could usefully be employed to supplement those of the Fracture Clinics without detracting in any way from the responsibility of the Clinics.

* e.g., by the South Derbyshire District Miners Welfare Committee.

(e) Psychological Factors; Co-operation of Patient.

In giving effect to a scheme of Rehabilitation such as the Committee is putting forward, covering the whole period from the occurrence of the accident until the restoration of full working capacity (or the fullest working capacity possible in the circumstances of the case) is completed, the object which must be kept primarily and steadily in view, if the scheme is to produce the best results, is the recovery of the patient; and the attention of all concerned must be concentrated on that throughout.

We are of the opinion that the best results can only be achieved when, owing to the traditions and reputation of Fracture Services, the patient will feel from the moment of his reception that he has embarked on a course which will end in the shortest possible time with his complete recovery. The whole Fracture Service of the country should be designed to achieve this object.

Recovery depends not only on the "positive" measures of surgical treatment, physiotherapy and reconditioning but on the "negative" measures for preventing the intrusion of factors which may militate against recovery.

The rate and degree of recovery will depend not only on the nature of the treatment given for the physical injury but also on the individual mental "make-up" of the injured man, on the extent to which the incentive towards recovery is present, and on the attitude adopted by his friends and advisers. The witnesses generally were agreed that a psychological factor was present in varying degree in the majority of cases, and that this was often a dominant factor in retarding recovery.

In the main the difficulties referred to were those noted in industrial cases as being caused by the consequential effects of disablement, viz., the fears and apprehensions as to security of employment, anxieties as to the maintenance of home and family, and the accumulation of debt as a result of the reduction of the weekly income. Dr. Lockhart (for the Association of Industrial Medical Officers) said: "There is a lot said about the psychological sequelae of accidents and that the patient gets emotionally disturbed as a result of his accident. I think we feel that a good deal of this is not so much the direct result of the injury, as it is of anxiety as to what is to be the economic sequel to the accident. Is he going to be permanently disabled? Is he able to carry on financially until he gets back to work? What is going to be the economic effect in general among his family?" Other witnesses stressed the fear of recurrence of disablement leading to reduced wage earning capacity at a future date and fear as to the prospect of finding work on discharge from treatment. One medical witness said, "The most potent force in preventing psychological sequelae among our employees is that the majority of our men are permanent servants who will remain at their work until the age

of sixty-five normally when they would be pensioned. It is most unusual to have any form of psychological sequelae among permanent workmen, whereas it is common among seasonal workmen ”.

Apart from these states of anxiety dependent on the consequential effects of disablement, a second group of cases was referred to by many witnesses, which were regarded as the psychological effects directly associated with the accident. In these cases an anxiety state was said to be induced by the natural apprehensions in regard to taking up work of a dangerous kind involving the risk of further accidents, as in the case of miners who could not again go down a pit, and of painters and electricians who dare not face going up a ladder. We were unable to get any definite evidence as to the incidence of these cases. It would seem that the condition might be only a temporary one and could to a large extent be prevented by occupational therapy or similar measures, directed towards the restoration of confidence. When, however, these effects occurred in a man with a highly neurotic disposition such a man might be prevented permanently from returning to his original employment and if alternative work was not available he might have to be considered as to his suitability for vocational training.

A third group of psychological sequelae is that in which the sequelae are determined by the effects of inefficient physical treatment, harmful medical suggestions, unnecessary hospitalisation or too prolonged passive treatment in massage departments.

Witnesses generally were agreed that in the case of fractures prolonged disability might result from unimportant degrees of displacement owing to the mental effect upon the patient, and that the bad psychological effects would be much diminished if fractures were treated efficiently in the first place. It would seem that this applies generally to the treatment of all accidents. The first doctor who treats an accident is in a strategic position either to encourage or prevent psychological sequelae. Dr. Moore instanced cases in which harmful suggestions as to the permanency of the disablement had been the starting point of serious psychological sequelae. In this connection a statement by Sir Farquhar Buzzard was quoted to us: “ If medical practitioners were as much alive to the psychological as to the physical dangers of a patient who had been in an accident, if they took as much care to prevent infection of his mind with insidious morbid ideas as they did to prevent infection of his body with pathological organisms, many of these cases would be cleared up ”.

Psychological insight and the ability to influence the minds of their patients for good are essential for all healers of the sick. The attitude of the staff and the mental atmosphere of

a fracture department must be such, if the results are to be good, as to influence the minds of patients powerfully towards recovery.

We have been told that the treatment in successful fracture departments is "50 per cent. psychological, 50 per cent. surgical". We understand this statement to mean that the staff imbue the minds of patients with the determination to get well as soon as possible. The patient's co-operation is secured, he employs his will-power to overcome his disabilities, he does his best to perform the prescribed exercises to bring movement back to stiff joints, and so on. We are informed that at centres which aim at the complete cure of their patients by thorough treatment in the shortest possible time the number of persons whose return to employment is retarded through psychological complications is very small. We are emphatically of opinion that fracture departments should have that aim, and are confident that mental complications will become correspondingly rare.

When the patient himself recognises that there is something wrong with his physical treatment or that it is too prolonged, suspicions, grievances, ideas of victimisation and compensation and fears of permanent disablement and loss of employment begin to form in his mind and the canker sets in—a canker which is very difficult to eradicate.

A fourth group of psychological sequelae is that in which questions of compensation and contentious litigation dominate the picture as factors influencing the incentive towards recovery, or giving rise to a state of grievance.

Our attention has been inevitably directed to the bearing of the provision made for "compensation" in industrial cases by the Workmen's Compensation Acts. The reduction of family income to thirty shillings a week or less presents to the father of a family a harassing problem. Another cause of anxiety is the possibility of a still further reduction when he is found to be capable of what is termed "light work". Dame Agnes Hunt writes: "The patients are afraid of improving because they know that they will be marked 'as able to do light work', and they know there is no light work. Others will refuse further treatment because it might result in a smaller sum when the final award is made." Other witnesses stressed the fact that the fear of loss of the right to compensation or of reduction of compensation was a potent factor in many cases in the retardation of recovery. Our attention was further drawn to the increase in recent years amongst all classes of society of "compensation mindedness"—the general idea that having received an injury a person is entitled to some compensation—and also to the harmful effects of the delay which was often said to occur in arriving at a settlement.

The effects we have called attention to above may be regarded as the "normal" psychological sequelae of accidents. We have

noted that they have been considered as in the main due to economic causes, to the effects of inefficient treatment of the physical injury and to complications related to the question of compensation. There remains for consideration another small but distinct group of cases in which the temperament and mental "make-up" of a person involved in an accident are such that more serious effects follow. These occur in persons who are constitutionally predisposed to the development of functional nervous disorders when exposed to any form of mental stress and give rise to the conditions which are included under the term neurasthenia, the most important of which are the cases of hysteria and anxiety neurosis. The appearance of these nervous disorders seems to bear no relation to the severity of the physical injuries. Apart from exceptional cases in which the accident was of such a kind as to evoke states of fright and terror, it would seem that the accident acted as a conditioning or precipitating agent in the onset of the neurosis and that very much the same factors as have been referred to in the normal psychological sequelae play a part in its development. These disorders do not differ in kind and cannot be distinguished clinically from those which characterise the failure of many individuals in all walks of life to adapt themselves to various forms of economic and domestic stress. It is recognised that these neuroses are prevalent amongst all classes of the population and they are not particularly associated with accidents. Indeed we feel that there may be danger in emphasizing the existence of these cases for, as was pointed out by Dr. Brend, "it is clear that an attitude which regards the psychoneuroses as likely sequelae of an accident is one which itself tends to create or increase the condition by suggestion."

Nevertheless they cannot be disregarded and it is certain that where these conditions exist the treatment of the physical injury is made more difficult and recovery is often retarded. The incidence of these neuroses in accident cases was estimated by the majority of witnesses as being considerably less than 1 per cent. in fracture cases, and about 1 per cent. or rather more in other cases of accident.

It has to be remembered, however, that this incidence includes cases of injury arising among the working classes, as among other sections of the community, which are not industrial in origin, and that in such cases neuroses arising from causes of the same or similar kind will be found to exist. This raises a problem of much wider range, which would be outside the scope of this Committee to consider.

We have given full consideration to the possibility of making specific recommendations for the lessening of these psychological sequelae and for the treatment of these neuroses in so far as they form a hindrance to rehabilitation.

(a) So far as what may be regarded as the normal psychological sequelae of accidents are concerned there was complete unanimity of opinion amongst witnesses that in the first place efficient treatment of the physical injury in a "fracture service" such as we propose would help very considerably to prevent these sequelae. Witnesses generally were further agreed that such complications would be considerably reduced by measures taken to relieve the consequential economic effects of the accident. Thus Dr. Snowden said "it would go a very long way to prevent such anxiety states arising if the patient could be assured that he would be taken care of until his working capacity was fully restored, that his home and family would be provided for and that his job would be ready for him when he was restored." Similarly the evidence of the Association of Industrial Medical Officers was—"if treatment and rehabilitation were made, with compensation and maintenance, part of a co-ordinated scheme much of the anxiety and consequently of the psychological sequelae would be eliminated." Mr. Griffiths, referring to Dr. Sherman's clinic at Pittsburgh, U.S.A., said "amongst the factors which accounted for his success was the fact that Dr. Sherman was able to send men back to work of some kind at an early stage so that occupational therapy really took place in the mills and there was no ground for the development of anxiety neurosis associated with the fear of unemployment or litigation."

We do not propose to offer any suggestions as to how these consequential economic effects or the difficulties related to compensation might be removed, as so far as industrial cases are concerned all these matters will now come under the consideration of the Royal Commission which has been appointed to consider the working of the Workmen's Compensation Acts. We would only stress the importance in the interest alike of industry and the community of finding a solution to the problem, if as we believe the rehabilitation of the injured worker is the primary consideration.

On one point however connected with the working of the Compensation Law, our inquiry leads us to make a definite recommendation. Under the law as it stands at present, an injured workman who has so far recovered as to be able to undertake 'light' work may have his compensation reduced. If, owing to the inability or unwillingness of his previous employer to find him such light work or to the state of the labour market in the place where he resides, he is unable to obtain such work, he has the choice either of applying to the Court for the restoration of his compensation to the full amount or (if he is an insured person) of applying for unemployment benefit. We are informed that unemployment benefit is frequently

claimed in such cases, with the result that a man may be receiving in partial compensation and unemployment benefit together more than his full compensation rate, or, if he has a large family, even more than his wages for full time employment. It is obvious, in such circumstances, that an injured man's "will to recover" is liable to be weakened. We would most strongly recommend that an injured man's capacity for light work, which may be reached at a certain stage of his treatment, should be regarded, not from the point of view of compensation and as a reason for reduction of the compensation, but solely as a means by which the complete restoration of his working capacity can be furthered. As long as the patient requires to be under the treatment of the Fracture Department he should continue to receive compensation as for total incapacity, unless light work of a remedial kind approved by the Fracture Department surgeon is available. In other words "light work" should only be admitted as part of the curative treatment, and under the conditions indicated elsewhere in the Committee's Report, and for that purpose it must necessarily be made available by the employer or otherwise. If that is not possible its place will have to be supplied, when necessary, by some other form of 'reconditioning.' We deal with this aspect of light work more fully later (Chapter VIII). Safeguards against any abuse will be provided by the power of the Fracture Department to discharge from treatment any man who, when fit to undertake such work as may be considered by the Department to have a curative value or (if such work is not available) a corresponding 'reconditioning' treatment, refuses or neglects to co-operate in the treatment by undertaking it.

It will be observed that we have discussed the foregoing questions on the assumption that treatment will take place in a fracture service organised on the lines recommended in the Report and under the same surgical control throughout. Under the conditions which have hitherto prevailed, and in the absence of continuity of treatment and an adequate "follow-up" procedure, the same considerations would not apply; and if the two systems were to continue to exist side by side, it would be difficult, if not impossible, to introduce the different outlook in regard to 'workmen's compensation' provisions and practice which we think a satisfactory fracture service would call for. If our proposals generally in regard to the establishment of such a service are approved, the need for a vigorous effort to secure their general adoption is emphasized.

(b) Though we believe that the major part of the psychological problem could be remedied by the organisation of fracture services and amelioration of the consequential economic effects of disablement, there still remains for consideration the question as to whether it would be possible or desirable to make

some special provision for the treatment of the neuroses. Divergent views were expressed by medical witnesses both as to the need for such treatment generally and as to the methods of treatment that should be given. The evidence of the Joint Committee of the Trades Union Congress and the British Medical Association was to the effect that special organisations for the treatment of these cases should be established if it were shown that the necessary treatment was not available in general hospitals. Witnesses on behalf of the Industrial Medical Officers Association also said that psychotherapy of some kind would be helpful in some cases, though the number of such cases would be small. One psychologist, Dr. Snowden of the Maida Vale Hospital, urged strongly the necessity for treatment by medical psychologists in all such cases and suggested the setting up of an experimental clinic for psychological treatment. At the same time he agreed that "a better understanding of the various kinds of neuroses in this field could only be brought about by the medical profession itself, and that the profession itself needed education in the matter before anything in the nature of organising clinics for treatment could be envisaged." On the other hand Mr. Elmslie said "I should personally trust very much more to the psychological effect of work and of a sympathetic assistant in getting him to work than to anyone who is going to sit down and discuss his psychological difficulties." Dr. Moore also expressed the view that there was no general need for the provision of psychological treatment and feared that it might be more likely to do harm than good.

The difficulties of this problem are still further increased when the question is raised as to whether the accident is actually the cause of the neurosis and as to where the liability for treatment of the neurosis lies.

On this point the position was succinctly stated in evidence by Dr. Brend, lately a neurologist on the staff of the Ministry of Pensions, and one of the Medical Referees under the Workmen's Compensation Acts, when asked as to what form of treatment should be provided in these cases—"Of course it depends a great deal upon whether you are simply going to treat the condition irrespective of the liability. An anxiety state has probably very little to do with the accident although the accident may have been a precipitating factor. Treatment will then be for a condition, which in my opinion, in most cases, was existing before the accident; so that it really becomes a problem of general treatment i.e. of the facilities available for the general population." We have also borne in mind the fact that psychotherapy is often a lengthy and expensive method of treatment and that it is only suited to a limited number of patients. Moreover, as we have mentioned above, there is a real danger that any special provision for the treatment of neuroses as connected

with accidents would encourage the idea that accidents are likely to produce neuroses, and would tend to create the very condition which the provision was intended to remedy in much the same way that the introduction and perpetuation of the term "Shell Shock" increased the incidence of the neuroses in time of war (finding of the War Office Committee of Inquiry into Shell Shock). For this and other reasons Dr. Brend said "Increase of the facilities for treating the neuroses is urgently required for all classes of the community but it does not seem to me advisable that a movement in this direction should form a prominent part of an effort to help injured workmen."

In view, therefore, of these divergencies of medical opinion, the difficulties involved in determining liability, and the possible dangers of making such provision we do not feel justified in making recommendations as to special treatment for the neuroses associated with accidents at the present time.

We believe that the emphasis should be directed towards their prevention on the general lines we have indicated and that in industrial accidents these neuroses will be less in evidence the more the conditions of work are favourable and the more the interests of the workmen are safeguarded by the employers.

The only suggestion we would make is that a fracture service should have facilities for consulting a medical psychologist when the Surgeon-in-Charge considers it desirable.

Nevertheless extended experience of the results of fracture services and the effects of economic remedies may in course of time indicate that there is still a residuum of cases for whom something more in the way of treatment will be required. Experience may show that it may be desirable to set up special rehabilitation centres, where intensive treatment specially applicable to them could be given, but we do not suggest that such centres should be established unless and until further experience under improved arrangements for fracture services and the failure of other methods have proved their necessity.

Another question of a different character which is of importance as affecting the co-operation of the patient is how to ensure the regular attendance at the out-patient clinics of patients who have reached the out-patient stage or have been treated in the out-patient clinic from the start.

The evidence before the Committee shows that for one reason or another out-patients who are instructed to report at the clinic for examination on particular dates frequently fail to do so.

One of the benefits of a properly organised "Follow up" system is that it enables a running check to be kept on such cases and measures to be taken, by reminders, visits of the almoner's staff and otherwise, to obtain the patient's attendance.

Where, however, the patients have to come considerable distances, difficulties of conveyance and the cost involved may be very serious obstacles to the patient's attendance. Under the Oswestry Scheme to which we refer on page 72 the difficulties have been minimized by the utilization of small "after-care" clinics at various points in the large area served by the hospital. A similar arrangement has been made in Lanarkshire by the Lanarkshire Orthopaedic Association which was established by the local practitioners' Union in co-operation with the coal owners and miners' associations to meet the needs of cases discharged from the Glasgow hospitals. Attendance even at such local clinics may involve some expense; under the Lanarkshire Scheme the employers refund any travelling expenses in excess of sixpence.

Such arrangements are the exception at present, and in the great majority of cases attendance at the central Fracture Clinic will be necessary. There are various ways in which the difficulty of conveyance can be got over. Assistance in necessitous cases can often be obtained through the Almoner's Department. We observe that in a Memorandum issued by the Institute of Hospital Almoners (July, 1932), this is mentioned as one of the services the Almoner can render. Employers and Insurance Companies are usually ready to help in such cases and can be approached by the Almoner. Some firms themselves arrange for the conveyance of their injured workers. In the South Derbyshire Coalfield, the District Miners Welfare Committee has organized a special service to collect out-patients on clinic days and to take them to the clinic and back. Possibly some extension of such services could be organized by other bodies. Presumably Public Assistance Committees would be ready to provide part or whole of the travelling expenses in necessitous cases.

It may be mentioned that some local authorities refund tram fares to necessitous patients attending certain daily municipal clinics. Again in connection with the statutory schemes for tuberculosis, venereal diseases, maternity and child welfare, similar arrangements are in force; and the Cancer Act 1939 provides a similar procedure for cancer patients.

We do not think it necessary to make any special recommendation on the subject. So far as cases that fall under the Workmen's Compensation Acts are concerned, the question of the payment of these expenses forms part of the general question of the cost of treatment which comes within the terms of reference of the recently appointed Royal Commission. Apart from these cases, the matter is one which, like some others connected with the restoration of the working capacity, can best be dealt with through the agency of the Almoner's Department as a centre of social service for hospital cases.

APPENDIX F.

ROUTINE OF A FRACTURE DEPARTMENT.

The following outline of the essential features of the routine of a fracture department is based on the most modern practice in this country and elsewhere.

The routine includes:—

1. The primary treatment of cases which can be dealt with as out-patients.
2. Daily fracture clinics at which all such out-patient cases attend.
3. Weekly fracture clinics for the review of all cases under active treatment, whether out-patients or former in-patients.
4. Arrangements for the care of in-patients.

1. *Primary treatment of out-patient cases.*

These cases will have been transferred from the casualty department of the hospital. A case is immediately examined by an assistant, who gives instructions for a suitable X-ray photograph to be taken. As soon as this is ready the fracture is reduced by the surgeon-in-charge or by one of his assistants, and suitably secured in plaster or otherwise. The limb thus secured is again X-rayed. If the result is satisfactory the patient is sent home with instructions to report at the daily fracture clinic on the following day. If the result is unsatisfactory or if any complication arises the patient should be retained in hospital.

A concise history of the circumstances of the accident, a brief description of the physical signs, together with particulars of the method of reduction and fixation, and the X-ray findings, are recorded on a fracture card (case-sheet), which is sent to the office of the fracture department.

2. *Daily fracture clinics.*

The daily fracture clinics are attended by all ambulatory cases which have to be seen daily, or almost daily, for some days after the initial treatment. The clinics are conducted by a senior assistant, assisted by a house surgeon. They are also attended by the plaster sister and a recording secretary.

On the first attendance of the patient after the initial reduction and fixation of the fracture, the accuracy of the reduction is "checked," the plaster and splinting inspected, a correct diagnosis entered on the record card, and the notes amplified where necessary. If the primary reduction is considered not to be satisfactory, arrangements are made to re-adjust the position of the fracture. If all is well, the patient is then instructed regarding the use of the limb as a whole, and the use of those joints which are not immobilised (e.g., fingers, elbow, shoulder, in a Colles fracture). In addition, for many of the common fractures, typewritten copies of such instructions are distributed to all patients concerned. A letter is sent to the patient's practitioner informing him of the nature of the case and the treatment given, and inviting his co-operation.

The new patients are now told when to attend the fracture clinic again, which may mean a daily visit for a few days if the limb needs careful supervision. They are warned to return immediately should any signs of undue pressure become apparent.

The whole programme of fracture treatment from beginning to end—reduction; fixation until union is present; protection until consolidation is complete; with an appropriate scheme of exercises both before and after removal of the splintage—is carried through in the out-patient fracture clinic.

If the fracture department includes a physio-therapeutic section, masseuses attend at the daily fracture clinic. They instruct the patients about the use of the limb and of the free joints, and note the surgeon's prescriptions for special physio-therapeutical treatment (massage, faradic stimulation of muscle, special exercise schemes).

If the physio-therapy department is separate from the fracture department, the directors of the two departments arrange for close co-operation. The prescription for special physio-therapeutical treatment recommended by the surgeon is entered on the patient's case-sheet, and transmitted to the physio-therapy department; a copy of the records of the treatment subsequently given in that department is also entered on the case-sheet kept in the fracture department. The patient continues to attend the fracture clinic.

3. *Weekly fracture clinics.*

The weekly fracture clinic is a review clinic of all cases under active treatment. For convenience, the clinic may be held twice weekly, if the number of patients requiring to be interviewed in any one week is too unwieldy for a single session.

The patients attending include:—

- (a) All out-patient cases of fracture under treatment.
- (b) All former in-patient cases of fracture.
- (c) Cases reporting at varying intervals for follow-up purposes.

The weekly clinic is conducted by the surgeon-in-charge and attended by the assistant surgical staff and the full auxiliary staff. Two stenographers may be required in a large clinic. At a teaching hospital senior students accompany the surgeon for instruction on cases.

All patients under treatment are seen at first every week, later perhaps every second or third week. Every patient is examined either by the surgeon-in-charge or a senior assistant, house surgeons assisting. By this means the work of the daily fracture clinics is closely supervised by the surgeon-in-charge.

Most fractures are re-X-rayed every third week to exclude re-displacement within the plaster. If any plaster is changed, the limb is re-X-rayed, by routine, to ensure that the position of the bones remains unchanged. All X-ray films are incorporated in the case-sheet. After plasters are removed the ranges of joint movement are accurately measured and recorded. Muscle development is noted. The patient continues to attend until recovery is complete.

When the patient is considered fit to be discharged, he is instructed to report after a certain interval in order to ascertain if the function of the injured part has been fully restored and to learn if he has resumed work.

4. *Arrangements for the care of in-patients.*

Patients requiring in-patient treatment are admitted, preferably to special wards, under the care of the surgeon-in-charge of the fracture department. The practice varies in different hospitals with respect to fractures of the skull and of the pelvis, and as regards cases of accident involving injuries to the abdomen in addition to a fracture or fractures; such cases are commonly admitted under the surgeon of the week, who consults the surgeon-in-charge of the fracture department about the treatment of fractures of the limbs or spine.

If the condition of the patient allows, an X-ray examination may be made in the casualty department, or in the X-ray department on his way to the ward, thus saving him disturbance later.

If a house surgeon has authority to admit a fracture case to the wards, he notifies the resident assistant forthwith. It is the duty of the resident assistant to see the case without delay in the absence of the surgeon-in-charge of the department. In cases of special difficulty the surgeon-in-charge must himself be notified.

A case-sheet of the uniform type used in the department is made out for an in-patient, as for an out-patient. It is kept in the ward, and continuation notes regularly dictated and typed.

All in-patient fractures are seen at least once daily either by the surgeon-in-charge, or his assistant.

If an operation is necessary the patient's doctor is notified of the time of the operation and invited to attend. After the operation, notes for the case-sheet are dictated, including instructions as to after-treatment, and a letter is sent to the patient's doctor.

On discharge from the ward, the patient is instructed to report at the weekly fracture clinic at a specified date, and the case-sheet is sent to the out-patient department.

5. *Follow-up organisation.*

For the great majority of the less serious fractures the weekly fracture clinic acts as a follow-up clinic. For other cases special follow-up clinics may be held.

No patient is discharged as not requiring further treatment until the fracture is firmly consolidated, until nerve injuries and other complications have recovered, and until joint movement and muscle development are as far as possible restored. In any case where it is probable that, with the lapse of time, there will be further change (for better or worse) the patient may be discharged but is given a card, advising him in his own interest, to attend the follow-up clinic.

The case-sheet may be stamped with a special mark, and the number of the case-sheet entered in a diary. Six months later the patient is sent a card instructing him to attend the follow-up clinic. The clinic may be held weekly, fortnightly or monthly. All the cases or selected cases discharged in the corresponding period six months earlier are examined, final notes are made on the case-sheet, and the follow-up index card is completed.

If the patient does not attend, he may be sent a second letter. If he still does not attend he may be asked to fill up a form of questionnaire, from which the follow-up index card is completed as far as possible.

6. *Records.*

In a typical fracture department a uniform records system is used with a single dossier, which follows the patient from his first admission to the fracture department until his discharge. The system comprises the following files and documents:—

- (1) Name index file.
- (2) Fracture case-sheets.
- (3) Disease index file.
- (4) Statistical records; weekly and yearly.

VII.—STEPS TO BE TAKEN TO GET FRACTURE SERVICES ESTABLISHED.

At an early stage of their inquiry the Committee considered the desirability of preparing a map—as a basis for consideration by all concerned—indicating the centres at which Fracture Clinics might be established (having regard to the existing distribution of hospitals) and the areas which might be served by them—so as to ensure that the whole country was covered; and for that purpose made some preliminary inquiries.

The publication, however, in April, 1937, of the Report of the Voluntary Hospitals Commission of which Lord Sankey was Chairman, with its recommendations for the division of the country for hospital purposes into “regions” and the formation in each region of a Voluntary Hospitals regional council to correlate hospital work (Report, paragraphs 25 and 26), and the decision of the British Hospitals Association to give effect to these recommendations, made it unnecessary for us to proceed with this idea.*

In the “conclusion” to our Interim Report we said:—

“The provision of a net-work of fracture services covering the whole of the country will call for careful planning and will involve the adjustment of the scheme in points of detail to meet local needs and conditions. The provision of a fracture clinic for any area and the mapping out of the area to be served by the clinic, is a problem which can only be satisfactorily solved by those in the locality who are concerned in its establishment; and if it is to be solved so as to render the most effective service there must be consultation and co-operation between the interests involved—the local government authorities, the larger voluntary hospitals in the more important centres, the smaller institutions in the rural areas, the medical profession, the ambulance services, and we would add the employers and workers and their respective organizations.”

* The British Hospitals Association states (2 March, 1939) that the present position is as follows:—

Three-quarters of the country has been mapped out into Divisions and some of these have already been sub-divided into Regions. The whole of England and Wales will consist of about 15 Divisions, in each of which there will be an advisory body or Divisional council. Several such councils are already in being and others in process of formation. In each Region there will also be a Council and several of these are already formed. Within 6 months it is believed that the sub-division into Regions will have been agreed upon and provisional arrangements will have been completed for the establishment of the appropriate councils.

In Scotland a policy of regionalisation was recommended by the Mackenzie Committee in 1926, and the five Regional Committees required were formed in 1929. Four are understood to be fairly active.

We strongly recommend that, as has already been done in some important centres, joint committees representative of the local government authorities having hospitals under their control and the regional councils of the voluntary hospitals should be set up for the purpose, or where such Committees are already in existence that they should actively take up the question of organising an effective Fracture Service in each area. The Joint Hospitals Advisory Board which has been established on these lines in Manchester is, so far as we are aware, the first Committee of the kind to work out a complete scheme for its area. The initiative should be taken by the major local authorities to whom statutory powers of making hospital provision have been given, i.e., the County Councils and County Borough Councils. We would also urge that other interests concerned, especially the local bodies representative of the medical profession and the organizations of employers and workmen, should be taken into consultation in regard to the arrangements to be made. In view of the importance of an adequate ambulance service (Chapter XIII) it would be desirable that the Ambulance Authorities of the area should also be taken into consultation.

We have considered further whether any statutory obligation should be placed on the local authority in this respect. We think it better on several grounds that, at any rate until further experience has been gained, the matter should be left to free consultation between the local authority, the voluntary hospitals and other parties interested.* It would, however, in our opinion be very desirable that the Ministry of Health or in Scotland the Department of Health should have the opportunity of advising on any plans in respect of their adequacy and practicability. We do not suggest that plans should be made to conform to some rigid and uniform standard, but the Departments, through their acquaintance with the working of Fracture Services in many districts of various characters, will be in possession of a body of experience which should be very helpful.

We have also considered whether any action, and if so what, should be taken when no plan is worked out. We hope that such cases will be rare, but if there should be any such, we suggest that the Minister should have power to appoint one or two independent commissioners to hold a local inquiry into the circumstances and to publish their report.

As illustrating the growing interest and belief in the value of the methods outlined in this report, we may mention that in a

* We note that the Committee on Scottish Health services which reported in 1936 recommended that in Scotland the hospital services should be developed by co-operation of voluntary and statutory hospitals and that a definite obligation should be placed on the local authorities to supplement existing hospital facilities if required to do so by the Central Department.

number of areas the initiative has already been taken by employers' organizations and arrangements have been made with local hospitals for the establishment of a fracture service which will provide for cases arising in the industry, with the financial support of the organizations.

We are glad to be able to report that on the initiation of prominent industrialists and others a movement has been set on foot in Glasgow which will, it is understood, result in the institution at one of the hospitals in the City of a Fracture Clinic in full conformity with the scheme outlined in this Report.

We may also mention that a conference was held at Manchester in October, 1936, by the General Federation of Trade Unions, and recently a Joint Committee has been appointed by the Trades Union Congress and the British Medical Association to consider among other matters of common interest the question of the rehabilitation of injured workers.

Indeed interest has been widely aroused among both employers and workers in industry, and we would wish to refer to, and express our appreciation of, the successful efforts made by the Industrial Welfare Society under the lead of its Director, Mr. Robert Hyde, to bring the subject under the consideration of employers in important centres such as Glasgow, Hull, Birmingham, Newcastle-on-Tyne, Swansea and Luton, as well as in London, and to secure their support. We would also acknowledge the help which the Miners' Welfare Committee have given by bringing the question to the notice of the District Welfare Committees and asking them to bear it in mind when considering grants to local hospitals.

The scheme which we have submitted is based on the assumption that the clinics will be established at, and as an integral part of, existing hospitals, though the possibility and desirability of establishing independent clinics in a few centres at which methods of treatment would be made the subject of special study, and post-graduate courses could be organized, should not be ruled out. (We return to this point later in Chapter XVII of this Report.)

Not all hospitals are called upon to deal with the number of cases, or can command the services of the staff or the resources, that are needed for the efficient functioning of a Fracture Clinic. Different opinions were expressed by witnesses as to the limit (whether fixed by the size of the hospital, as judged by the number of beds available, or otherwise) below which a Fracture Clinic could hardly be maintained effectively.

The witnesses from the Robert Jones and Agnes Hunt Hospital, Oswestry advised that a high standard of treatment which ought to characterise a modern Fracture Clinic cannot

be maintained unless a certain volume of work can be counted upon. In their opinion, 500 cases a year would be ample to justify the establishment of a clinic.

Mr. McMurray, Director of Orthopaedic Studies in the University of Liverpool, also thought that there should be a fracture unit in a hospital which had as many cases as 500 a year, though in a district where this figure was not reached it would be necessary to adopt some hospital as the seat of a fracture unit even if the cases did not number more than two or three hundred a year.

On the other hand Mr. Elmslie considers that a small number of large and highly efficient clinics would be both better and more economical than a large number of scattered clinics—distance he did not regard as an important factor (this had been found in the war); “there is no urgent necessity for a fracture always to be set at the earliest possible moment”.

Mr. Girdlestone (Wingfield-Morris) described the system under which all the general hospitals and most of the cottage hospitals in three counties (Oxfordshire, Bucks, Berks.) have been linked up with the central clinics at Oxford and are visited about once a fortnight, or oftener if asked, by the staff of the central clinics; and gave it as his opinion that “given an arrangement of that kind, and provided fracture work was placed in the hands of one keen surgeon, there was no reason why it should not be carried out efficiently at quite a small hospital. Certainly every hospital of more than 50 beds serving an area of 10 or 15 miles radius ought to have an organized fracture service”.

On balance the evidence would seem to indicate that if a Fracture Clinic is to maintain its efficiency it should handle not much fewer than 400 cases a year. In regions of the country, however, where the population is too widely scattered to permit of a large enough number of cases being readily brought to a centre and treatment has to be decentralised, a system such as that organised by the Wingfield Morris Hospital would be an alternative method of organising the work (see later in this chapter under “provision for rural areas”).

Coming to Scotland where the geographical conditions and distribution of the population make a still more difficult problem, we may quote the evidence of the Royal College of Surgeons, Edinburgh:—

“In the case of a city like Inverness, for example, on account of its remoteness from any other centre, it was obviously impossible to contemplate any other arrangement than that the fractures arising there would be dealt with locally. Further, it was not wholly a matter of the size of the hospital as gauged by the number of beds but rather

of how expert the staff is that is available to deal with them. In a small town like Dunfermline, where the hospital has about 100 beds, the expert supervision available would make that hospital quite suitable for the establishment of a fracture clinic. Generally, however, the degree of experience necessary to create an expert could only be secured under conditions which would provide a large amount of practice."

It will be seen, therefore, that no hard and fast lines, or definite rules, can be laid down. The arrangements for any area must be settled after consideration of all the circumstances and conditions of the area. We consider the subject of the provision for rural areas later.

So far as urban areas are concerned, the question whether a fracture clinic should be established at any particular general hospital, will depend partly on local needs, partly on the resources and staff available. Where a fracture clinic at one of two or three local hospitals is found sufficient for local needs, some sort of pooling arrangement between the hospitals and the hospital staffs will be the most convenient and most efficient arrangement. We give instances of different kinds of arrangements that have been made at different centres.

At Bristol the two voluntary general hospitals have amalgamated and provide two fracture departments under one Director and with a common staff.

At Sheffield, where the two large general hospitals have also amalgamated, each continues to provide a fracture department under a centralised general control.

At Manchester, under the scheme of the Joint Hospitals Advisory Board, hospitals treating fractures in the City would be organized in three groups. The hospitals in each group would arrange for transfer of fracture cases, and their fracture departments would have, very largely, the same surgical staff.

At Birmingham, the amalgamation of the two general hospitals as the Birmingham United Hospital is enabling a central fracture department to be established.

We deal with the case of London in a separate chapter.

It is hardly necessary for us to say that, in our opinion, it is of the first importance that every Teaching Hospital should have a fully staffed and equipped fracture clinic.

As we have already stated, we consider that in all cases a beginning could be made with but little capital expenditure whilst much of the staff necessary for the re-organization is already available at the hospitals.

The existing general hospitals in Great Britain which treat fractures may be arranged in four groups which are shewn in the following table together with the number of fractures treated by each group:—

<i>Size and character.</i>	<i>Number.</i>	<i>Number of new Cases of fracture treated in 1935.</i>
1. Teaching hospitals	34	50,757
2. Other general hospitals with 200 or more beds:		
Voluntary	48	41,438 } 59,410 17,972 }
Municipal... ..	90	
3. General Voluntary Hospitals with 100 to 199 beds.	112	45,371
4. General Voluntary Hospitals with less than 100 beds.	588	36,001
Total		191,539

It will be seen that the first group, the Teaching Hospitals, deal with about 25 per cent. of all the cases. Of the 34 Teaching Hospitals 14 have Fracture Clinics organized on the lines recommended in our Report according to the information at present before us.

The second group deals with 29 per cent. of the total number of cases. This group includes a considerable number of large hospitals with about 300 to 400 beds; they treat many fractures, and are well staffed; they either have the staff for a Fracture Department or should be able to provide the necessary personnel without difficulty. According to our present information, 18 of the 48 Voluntary Hospitals and 7 of the 90 Municipal Hospitals, which are included in this second group, have fracture departments organised on the lines which we recommend.

The third group of 112 hospitals with 100 to 199 beds presents a more difficult problem. The difficulty is that many of these hospitals are staffed by surgeons in general practice, who as a rule could not afford the time necessary for supervising a Fracture Department. We have not heard of more than 27 in this group where a properly organized Fracture Clinic exists. But in many instances a hospital of this type is the only available institution serving a considerable area or population, and, as the preceding table shows, many of them are treating 450 cases a year or more; and we feel that a great effort ought to be made to set up Fracture Departments, rather than that cases should be sent to the nearest city perhaps 20 or 30 miles distant. It would be important, however, when circumstances permit, that they should be linked up with a central clinic, which would preferably be a teaching hospital, for general and consultative purposes—as is already done in some districts.

These first three groups of general hospitals together deal with nearly 76 per cent. of the cases and the establishment of Fracture Departments in these hospitals would go far to solve the problem.

The fourth group of 588 hospitals with less than 100 beds, dealing with 36,001 cases, presents a most difficult problem which admits of no ready solution. A certain number of these hospitals should certainly be advised not to deal with fractures at all, beyond possibly giving "first aid" and then sending the cases elsewhere. For the rest there must be a close liaison with the nearest large hospital with a fracture clinic, either by sending on cases to this hospital, or receiving regular visits from members of the staff of this hospital.

We are informed by Mr. McMurray, who is in charge of the Fracture Department of the David Lewis Northern Hospital, that arrangements of this kind are in operation as between Liverpool and some of the outlying Lancashire towns. Mr. McMurray writes:—

"I would suggest that these small country town Cottage Hospitals should have on their staff a Consultant from one of the large Teaching Hospitals. Under these circumstances the Consultant could be brought in in any case of necessity to see, advise and possibly treat severe fractures. Preferably he should have a definite day to visit the Cottage Hospital when he may see the cases under his care, and also any new fractures which have come in since his last visit. In this way the staff of the hospital could be trained, the nurses improved in the treatment of such cases, and the results obtained by the Fracture Service in that small hospital would be equal to those obtained in the Teaching Hospital.

"It is no good suggesting that the Cottage Hospital has the opportunity now of calling in such Consultants, for as a matter of fact such admission of Consultants to the smaller hospitals practically never occurs. Usually the staff of the smaller hospitals feel that they are insulted if it is even suggested that any other surgeon should be brought into their hospital. If the Consultant was already a member of the staff then this feeling of slighting would not take place, and more frequent consultations would be the rule."

We therefore think that the difficulties of dealing with the small hospitals should not be allowed to delay re-organization in hospitals in the three other important groups, in which the necessary plans offer no insuperable difficulties. And furthermore we feel convinced that if the teaching hospitals and large city and county hospitals had well organized Fracture Departments, the number of cases retained for treatment at these smaller hospitals would progressively diminish.

The Table in Appendix G indicates more fully the extent to which the principles of segregation of fracture cases, unity of control, continuity of treatment, are being applied at the present time according to the information collected by the Committee from the hospitals themselves. (The first inquiry was made in July, 1936, and the information then obtained has been supplemented by reports received from time to time; but the Committee may not have been informed in all cases of changes that have been effected since, and the actual position is possibly more favourable than the Table shows). Briefly, out of 899 general hospitals treating fractures, 74 in England, 3 in Wales and 1 in Scotland appear, according to the information supplied, to be applying those principles completely; and 20 in England, 1 in Wales and 3 in Scotland are doing so to a greater or less extent.

Fracture Clinics on these lines are now established in many of the great cities, Birmingham, Bristol, Cardiff, Hull, Leeds, Liverpool, Manchester, Newcastle, Nottingham, Portsmouth, Sheffield, and to an increasing degree in London. They include the majority of the teaching hospitals in the provinces.

The question may be raised whether, in the first instance, trained personnel will be available for a rapid extension of the system of Fracture Clinics. We are satisfied that no apprehension need be felt on this score.

In the fracture departments already established at general hospitals of medium or large size the surgeon-in-charge has of necessity to have at least one Senior Assistant or Fracture Registrar, who usually has the F.R.C.S. diploma and is often intending to practise as a consulting surgeon, probably as an orthopaedic surgeon. A man who is suitably qualified and has spent some years as chief assistant in a Fracture Department is competent to take charge of a fracture service, and during recent years, as fresh Fracture Departments have been established such fully-trained men have been available to take charge of them.

The number of men now in training for such appointments must be considerable. Seventy-eight hospitals have informed the Committee that they have Fracture Departments organized on the lines advocated by the Committee; in a considerable proportion of these 78 hospitals there is a Senior Assistant in the Fracture Department. The total number of general hospitals in Great Britain with more than 100 beds is 284, and at many of these a fracture department will not be needed.

At many of the hospitals, moreover, where there is a need for, and the possibility of providing, a Fracture Department, there is already a surgeon on the staff who is in established practice and who would be placed in charge of the new department because of his interest in, and experience of, the treatment of fractures.

It seems, therefore, that there will be a sufficient supply of experienced men coming on to take charge of newly-established fracture departments, provided that the appointments offer the possibility of the holder earning a reasonable livelihood in consulting practice.

Provision for Rural Areas.

We have given a great deal of attention to this, the most difficult problem connected with the organization of a system of fracture services for the country as a whole. For the individual residing in the country it is just as important that there should be available a fully competent fracture service as for the resident in the towns; and it also has to be remembered that—under modern traffic conditions—a large number of the road casualties happen in country districts, and provision is needed for these cases as well as for cases occurring among the resident population.

Roughly speaking, there are two main methods of providing for cases in rural areas. One is to transfer all cases to a central Fracture Clinic in a town hospital. The other is to develop and strengthen the small local hospitals by liaison with, and skilled assistance from, a central clinic. Admirable examples of these alternative methods are presented respectively by the Robert Jones and Agnes Hunt Orthopaedic Hospital at Oswestry, and the Wingfield-Morris Orthopaedic Hospital at Headington outside Oxford and the outlying hospitals in the counties of Oxford, Berks and Bucks which are linked with it.

Under the Oswestry Scheme, all cases are brought into the central hospital forthwith. Unless their homes are in the immediate vicinity of the hospital they are retained as in-patients until they can be safely discharged to their homes. Cases which live sufficiently near the hospital attend the hospital as out-patients for continuation treatment. For cases living at a distance 35 small after-care clinics (distributed over eight counties) have been established which are visited at intervals of about a week by "orthopaedic sisters" who bring the case into hospital if it is not doing well and they cannot deal with it themselves. During the interval between visits the patient is under the supervision of his general practitioner.

In the three counties served by the Wingfield-Morris Orthopaedic Hospital at Oxford, fracture cases are treated in the hospitals in the small country towns. These hospitals are visited regularly by surgeons from the Wingfield-Morris Hospital. Surgeons at the local hospitals are being trained in fracture work. Difficult cases are transferred to the Wingfield-Morris Hospital. The scheme is at an early stage of development, but aims at

making the local hospitals safe places for the treatment of fractures by the local staff, working in co-operation with the staff of the Wingfield-Morris Hospital.

It seems that fracture schemes in rural areas should follow one or other of these models: either the case must be brought to the expert at the central hospital or the expert from the central hospital must visit the case in the local hospital.

It is not necessary for us to decide between these alternative methods or to recommend either in preference to the other. The experience of the war demonstrated the possibility of transporting serious cases long distances without injury and as already stated a good deal of the evidence we received was in favour of transporting all cases without delay to the central clinic.

In general, we are of opinion that it is better that a case of fracture should be treated by an expert, even at the cost of some delay, than that it should be treated as a matter of urgency by taking it automatically to the nearest hospital or medical practitioner. On the other hand, immediate treatment may be imperative as a life-saving measure, or the condition of a serious case in a cottage hospital may remain grave for a considerable time, so that his transfer is out of the question. There are many conditions, such as shock, haemorrhage, internal injuries, and so forth, which may be decisive considerations in individual cases.

There are two governing considerations which should be kept in view in framing any scheme. Every case should be seen by an expert within a few days. Secondly, a compound fracture is a serious surgical emergency requiring immediate operation by an expert.

In Scotland particularly there are a number of hospitals at which it is unlikely from considerations of size that the fracture clinic organisation outlined in this Report can be obtained, but which must nevertheless, largely on account of geographical considerations, continue to treat fracture cases. We suggest that so far as practicable special arrangements should be made for these hospitals to be visited regularly by a surgeon expert in the treatment of fractures.

Eventually, the problem will, we are inclined to think, find a solution in a combination of the two methods. The rural hospitals, from their connection with the central clinics, will gradually become better trained in fracture work and more capable of dealing with the general run of cases, while the more difficult cases will find their way to the central clinics. After all, the treatment of fractures is not a "mystery". It is as regards most cases within the powers of any competent person who has received the proper training and has the proper equipment.

We recommend—

(1) That the County Councils and County Borough Councils which have powers under the Public Health Act, 1936, of making hospital provision for the needs of their areas, should be asked by the Government to review, in consultation with the representatives of the Voluntary Hospitals in their areas, the existing provision in their areas for the treatment of Fractures and allied injuries and prepare schemes for an effective Fracture Service. (The part of the local authorities in such plans might be either the provision of clinics themselves in their hospitals or the subsidizing of clinics in the Voluntary Hospitals or both.)

(2) That the schemes when drawn up should be submitted to the Ministry of Health or the Department of Health for Scotland for examination and advice.

(3) That the Medical Officers of Health should be asked to report periodically on the working of the arrangements made.

(4) That the Departments should, in the case of areas for which no plans are prepared, appoint one or two independent Commissioners to hold a local inquiry into the circumstances and publish their report.

APPENDIX G.

Statement showing by Counties (1) the hospitals at which there are, according to the statements provided by the hospitals themselves, special arrangements for the treatment of fractures, and (2) the hospitals which are stated to have the question of special arrangements under consideration.

The grouping is based on information supplied by the hospitals themselves.

The hospitals have been grouped as follows:—

Group I.—Hospitals in which it appears that all fractures (both in- and out-patients) are treated in special departments in which the principles of segregation of cases, unity of control and continuity of treatment are followed.

Group II.—Hospitals in which special departments for the treatment of fractures have been partially organized; i.e., the majority of fractures, but not all, are treated in those special departments; or the principles of segregation of cases, unity of control and continuity of treatment are incompletely observed.

Group III.—Hospitals in which in-patient cases of fracture are dealt with under the general surgical routine but all ambulant cases are treated in a special clinic.

Group IV.—In these Hospitals fracture cases are said to receive special attention at special sessions or otherwise, but the arrangements are not sufficiently well organized to warrant description as a special department.

Group V.—Fracture cases in these hospitals appear to be treated at present under the general surgical routine, but consideration is being given to the question of instituting special arrangements.

Group VI.—Orthopaedic Hospitals treating recent fractures.

The information in the possession of the Committee about "after-care" is not sufficient to enable it to be used as a factor in grouping.

Segregation of cases may be understood as meaning either (a) treatment by an organized team or (b) the physical separation of patients with fractures from other patients. For the present purpose segregation has been interpreted as meaning the organization of the treatment of fractures as a special service; the provision of separate accommodation for fracture cases has not been considered an essential ingredient. Reservation, and exercise, of the right of honorary surgeons to retain cases referred to them or cases in which they are specially interested has not been held to impair this condition.

Unity of control has been construed as meaning that one member of the honorary staff is in charge of the special service. Organization of a special service under the direction of the resident surgical officer has not been regarded as implying unity of control.

Continuity of treatment has been deemed to be observed when it has been stated that the surgeon in charge directs treatment at all stages, or that by collaboration with his colleagues he exercises what appears to be effective control throughout.

These criteria relate solely to methods of organization. They afford no indication of the standard of service maintained at the hospital.

ENGLAND.

Geographical County.	Groups.						Totals.
	I.	II.	III.	IV.	V.	VI.	
Bedford	—	—	—	—	I	—	I
Berks	—	—	I	I	—	—	2
Bucks	—	—	—	I	—	—	I
Cambridge	—	—	—	I	—	—	I
Isle of Ely							
Chester	4	—	—	3	I	—	8
Cornwall	—	I	—	—	—	—	I
Cumberland	—	—	—	—	I	—	I
Derby	I	—	—	—	I	—	2
Devon	—	I	—	—	—	I	2
Dorset	—	—	—	I	—	—	I
Durham	2	—	—	3	I	—	6
Essex	5	I	—	2	I	—	9
Gloucester	4	—	—	I	—	—	5
Hereford	—	—	—	—	—	—	—
Hertford	—	—	—	—	—	—	—
Huntingdon	—	—	—	—	—	—	—
Kent	2	I	I	4	2	—	10
Lancaster	17	I	—	12	I	—	31
Leicester	2	—	—	—	—	—	2
Lincs. (Holland)	—	—	—	—	—	—	—
Lincs. (Kesteven)	—	—	—	—	—	—	—
Lincs. (Lindsey)	I	—	—	I	—	—	2
London	6	4	2	8	5	2	27
Middlesex	I	4	—	3	—	2	10
Norfolk	—	—	—	I	I	—	2
Northampton	—	—	—	2	—	I	3
Soke of Peterborough	I	—	—	—	—	—	I
Northumberland... ..	I	2	—	—	—	—	3
Nottingham	3	—	—	2	I	I	7
Oxford	—	—	—	3	—	I	4
Rutland	—	—	—	—	—	—	—
Salop	—	—	—	—	—	I	I
Somerset	I	—	—	—	—	—	I
Southampton	I	I	—	—	2	—	4
Isle of Wight	I	—	—	—	—	—	I
Stafford	4	—	2	I	I	2	10
Suffolk (East)	I	—	—	I	—	—	2
Suffolk (West)	—	—	—	—	—	—	—
Surrey	—	—	—	5	—	—	5
Sussex (East)	2	—	—	I	I	—	4
Sussex (West)	—	—	—	I	—	—	I
Warwick	2	—	3	2	—	—	7
Westmorland	—	—	—	—	—	—	—
Wiltshire	—	I	—	2	—	—	3
Worcester	I	—	—	I	—	—	2
Yorks (E. Riding)	2	—	—	—	—	—	2
Yorks (N. Riding)	2	—	—	—	I	—	3
Yorks (W. Riding)	7	3	I	3	—	—	14
Total: England	74	20	10	66	21	11	202

WALES AND MONMOUTH.

Geographical County.			Groups.						Totals.
			I.	II.	III.	IV.	V.	VI.	
Anglesey	...	...	—	—	—	—	—	—	—
Brecknock	...	...	—	—	—	—	—	—	—
Caernarvon	...	...	—	—	—	—	I	—	I
Cardigan	...	...	—	—	—	—	—	—	—
Carmarthen	...	...	—	—	—	—	—	—	—
Denbigh	...	...	—	I	—	—	—	—	I
Flint	...	...	—	—	—	—	—	—	—
Glamorgan	...	...	2	—	I	—	3	—	6
Merioneth	...	...	—	—	—	—	—	—	—
Monmouth	...	...	I	—	—	—	—	—	I
Montgomery	...	...	—	—	—	—	—	—	—
Pembroke	...	...	—	—	—	—	—	—	—
Radnor	...	...	—	—	—	—	—	—	—
Total: Wales and Monmouth	...	...	3	I	I	—	4	—	9

SCOTLAND.

Geographical County.	Groups.						Totals.
	I.	II.	III.	IV.	V.	VI.	
Aberdeen	—	I	—	—	I	—	2
Angus	—	—	—	—	—	—	—
Argyll	—	—	—	—	—	—	—
Ayr	—	—	—	—	I	—	1
Banff	—	—	—	—	—	—	—
Berwick	—	—	—	—	—	—	—
Bute	—	—	—	—	—	—	—
Caithness	—	—	—	—	—	—	—
Clackmannan	—	—	—	—	—	—	—
Dumfries	—	—	—	—	—	—	—
Dunbarton	—	—	—	—	2	—	2
East Lothian	—	—	—	—	—	—	—
Fife	—	—	—	—	I	—	1
Inverness	—	—	—	—	—	—	—
Kincardine	—	—	—	—	—	—	—
Kirkcudbright	—	—	—	—	—	—	—
Lanark	I	—	—	—	I	—	2
Midlothian	—	I	—	—	—	I	2
Moray and Nairn	—	—	—	—	—	—	—
Orkney	—	—	—	—	—	—	—
Peebles	—	—	—	—	—	—	—
Perth	—	—	—	—	—	—	—
Renfrew	—	—	—	—	—	—	—
Ross and Cromarty	—	—	—	—	—	—	—
Roxburgh	—	—	—	—	—	—	—
Selkirk	—	—	—	—	—	—	—
Stirling	—	I	—	I	—	—	2
Sutherland	—	—	—	—	—	—	—
West Lothian	—	—	—	—	—	—	—
Wigtown	—	—	—	—	—	—	—
Zetland	—	—	—	—	—	—	—
Total: Scotland	I	3	—	I	6	I	12

SUMMARY.

	Groups.						Totals.
	I.	II.	III.	IV.	V.	VI.	
England	74	20	10	66	21	11	202
Wales and Monmouth	3	1	I	—	4	—	9
Scotland	1	3	—	I	6	I	12
GRAND TOTALS	8	24	11	67	31	12	223

VIII.—AFTER-CARE.

In a previous chapter we have outlined a scheme for a Fracture Service, the function and stages of which would be twofold, namely, to secure (1) by surgical treatment, the satisfactory union of the bone or bones, (2) by physio-therapy and exercises, the restoration of the muscles and joints affected by the injury to their full normal functioning.

In a great proportion of the cases which will be treated in the service, this is all that will be needed. On the conclusion of the treatment—if not before—patients whose normal work or life involves no special strains or stresses—physical or other—will be able to return and take it up without any interval, beyond possibly in the more serious cases, a short period of “convalescence”.

This will not be so with all. It is to be expected that there will be a number of cases in which the patient at the end of the second stage is not yet fit to return to his normal work—either because the hospital is not provided with the equipment for physio-therapy and remedial exercises required for completing the full restoration of functional activity, or because the man's normal work is of so arduous a character that a general reconditioning is needed as well, to fit him for it. As to this the results of our inquiry leave us in no doubt.

As the underlying principle of the Committee's proposal is that the injured person should be “taken care of” until working capacity has been restored as completely as is possible, we proceed in the present chapter to consider what further provision can and should be made for these cases.

The problem is both important and difficult. The gap between discharge from hospital and return to work, in the case of the working man, may be a burdensome and unhappy period, and may postpone indefinitely his ultimate restoration. He may have little or nothing to occupy the time; he becomes discouraged; his compensation may have been reduced because he is supposed to be fit for light work; he is very probably in many cases under-nourished.

The importance of the question was well brought out in the letter from His Honour Judge Burgis which appeared in “The Times” of the 25th June, 1937 and in the correspondence to which it gave rise. The Judge pointed out that, at the close of the hospital treatment, a period of graduated work or, alternatively, remedial exercises, is needed to enable a man to recover his full powers, and asked—

“Where can this graduated work be obtained? This is a difficulty that regularly confronts the Judges who have to administer the Workmen's Compensation Act; the

medical witnesses regularly emphasise its necessity. Such work cannot be obtained in the home of the working man; there is not the room, there are not the facilities and there is not the knowledge that is necessary to give the work its remedial qualities. The only person who is in any way likely to provide remedial work is the employer in whose service the workman met with his accident. In most cases the requisite type of work is not available and the employer is unwilling to create it. The result is that the injured workman is unable to obtain the remedial work which is so essential to a rapid restoration to efficiency, and in consequence he drags out a long and protracted convalescence which saps his morale ”.

The Judge is describing what may, and does, happen under present conditions. Under a system of Fracture Services such as we have outlined in Chapter VI, the remedial exercises which are needed should, and we hope will be, to a large extent provided at the Clinic before the injured man is discharged from treatment.

The institution of Fracture Services on the lines which have been indicated will not, of course, ensure the same standard of treatment everywhere; and particularly on the physio-therapy or re-education side, considerable differences in equipment, practice and efficiency are to be expected for some time to come. The completeness of the provision made at the new Albert Dock Hospital which was opened by Her Majesty Queen Mary last October and of which a description appeared in the “ *Lancet* ” of 29th October, 1938, will, unless wealthy benefactors can be found, be beyond the reach of most hospitals where Fracture Services are established.

We have therefore come to the conclusion on the evidence before us that there will be a residuum—of greater or less dimensions—of cases for which some further provision will be required after treatment in the Fracture Clinic: and we proceed to consider (1) the nature and probable number of cases requiring further treatment; (2) the character of the treatment required; (3) the ways in which, or means by which, it can be provided.

The cases fall into two groups according to whether the want of fitness is the result of (1) physical or (2) psychological causes. The first group comprises cases of men who are physically whole again and whose muscles and joints are in working order, but who are not equal to the strain of continuous work in the heavy kinds of labour in which they were employed before the accident. They require to be got into “ condition ”, including the restoration of confidence in their bodily powers. There will also be, until fully efficient provision for physio-therapy and

remedial exercises is generally available at the clinics, a number of the cases described in Judge Burgis's letter.*

The second group is fully described in Chapter VI and comprises those in whom the effects of the accident have become complicated by the intrusion of psychological factors which have set up a resistance to the response to physical treatment.

The first group is the simplest and easiest to deal with and we consider it first.

As regards the number of cases likely to be found in this group in future it is not possible at present to form any estimate. Much will depend on the completeness and efficiency of the provision at the fracture department for physio-therapy and remedial exercises. As already mentioned, several witnesses have expressed the opinion that given the treatment recommended in an organized clinic, the number of fracture cases likely to need anything more will be very small.

In a memorandum outlining a scheme for the establishment of Rehabilitation Centres to provide for these cases which was placed before us by a Joint Committee of the T.U.C. and B.M.A., the proportion of fracture cases which would need a process of rehabilitation after discharge from the clinic was put as high as 25 per cent. It was based on the view that:—

“It is difficult to ensure the necessary procedure of rehabilitation under existing conditions. The surgeon responsible for the primary treatment and the early remedial stages is unable to secure for his patient a full restoration of working capacity, mainly because the limit of his hospital facilities has been reached.”

The extension and improvement of these facilities is an integral part of the scheme we have submitted, and as that side of the treatment in the Fracture Service is developed and perfected, the number of such cases as Judge Burgis refers to and the T.U.C. has in mind will, it may be confidently expected, steadily diminish. Some residuum of cases which, from one cause or another, have not responded to the treatment must, no doubt, be allowed for; and in the meantime, the problem remains of dealing with the cases for which adequate remedial treatment has not been available at the Hospital, or in which, though the restoration of function has been effected, the man requires a general reconditioning before taking up the heavy work, say, of a coal miner or a navvy.

* Mention may also be made here of the long drawn out cases (e.g. compression fracture of the spine, or severe compound fractures) where recuperation is exceedingly slow, and which a busy voluntary hospital with a waiting list is often anxious to get rid of. One or two witnesses suggested that arrangements were needed for their treatment at special institutions. These cases, however, are cases which still require medical or surgical treatment, and should, in our view, remain under hospital control and supervision. We understand that it has been found possible in some cases to transfer them, by arrangement, to the hospitals of the municipal or county authorities.

While the number of such cases can only be determined by actual experience of the working of the Clinics we are satisfied that, especially in the industrial districts of the country, they will continue to be numerous enough to require that organized arrangements should be initiated and maintained for ensuring their complete restoration.

The character of the treatment required in the case of men who only require to be got into condition, i.e., reconditioning in the strict sense, presents no special difficulty as a general rule. The reconditioning required is analogous to that of the training of an athlete, and can, in most cases, be effected by a graduated series of exercises or activities (under conditions to which we refer below) until the patient has worked himself up to the fulness of his bodily powers.

The reconditioning period would normally be quite a short one.

The exercises or activities may take the form of gymnastic exercises, games, occupations of one sort or another, such as are provided, for instance, at the new Albert Dock Hospital to which we have already referred, at the L.M.S. Clinic at Crewe (Dr. Moore), and other institutions. We refer below to the possibility of using physical fitness centres which are being established throughout the country under the National Fitness Campaign for this purpose. Or the activities necessary may take the form of graduated work at his previous place of employment or elsewhere. This brings us to the very important question of "light work" as a means of reconditioning. There is a considerable measure of agreement that, if work of a kind suitable to the condition of the patient and progressive in character is available, or can be made so, at his old place of employment, there are great advantages in this mode of reconditioning. The follow-up service of the clinic should be able to avert the very real danger of men attempting to get back to heavy work before they are fit.

Many employers are genuinely anxious to help their workers in this way, and very interesting information has been obtained as to the arrangements made by various firms. The representatives of the Industrial Medical Officers' Association (which includes some 30 practitioners employed in large firms over a wide range of industries) said that in the majority of their members' firms light work was provided as a means of rehabilitation and that most of their members were able to supervise men doing such light work. They usually had only to report to the management that a man was ready for light work and a job would be found. In a majority of the firms pay was allowed to men periodically reporting for examination to the hospital. By keeping a close watch on progress the industrial doctor is able to regulate the return to work, and because of his

intimate knowledge of the man's job and of his financial affairs, and by continued contact with the man himself, this part of industrial medicine becomes a link in the chain of rehabilitation the significance of which is now becoming more fully realised in the country.

Evidence to a similar effect came also from other sources; and, generally, the National Confederation of Employers' Organisations said that a great deal more was done by employers in the direction of finding light work than is generally appreciated. The Confederation was of opinion that reconditioning can best be effected by light work in the man's own factory or workshop when it is possible to provide it there.

There are undoubtedly considerable difficulties in the way of the general application of this method of "reconditioning". Judge Burgis in his letter has alluded to some of them. Apart, however, from the action taken by individual firms, there is no evidence of any systematic attempt either on the part of particular industries or by the employers as a body in particular industrial localities, to organize systematic provision for the "reconditioning" of convalescent workers. And unless the provision of light work is organized under proper supervision, it cannot be accepted as an adequate method of reconditioning.

It is impossible for us to estimate to what extent graduated work as a reconditioning measure can be provided but we would urge a detailed study of the possibilities by the industries themselves individually.

The difficulties connected with the provision of light work as a means of completing the full restoration of working capacity are greatest, of course, in the case of those for whom the fracture clinic is unable to provide the full physio-therapy or remedial exercises necessary to bring about full normal functioning of the muscles and joints. In these cases particularly it is not sufficient, of course, to provide any sort of light job. This may be worse than useless. The wrong sort of light work may result in permanent incapacity for full work. Some of the difficulties hitherto connected with light work as a means of rehabilitation have been pointed out by the Surgeon of a Clinic serving a mining area as follows:—

(1) Light work is usually selected in such a way that it avoids the use of the injured part. The man with a weak ankle is prohibited from walking about on rough surfaces, and the man with a weak back is prohibited from bending or lifting. In scientific rehabilitation, on the other hand, the principle employed is *graduated activity of the affected part*.

(2) Proper rehabilitation can only be carried out under expert medical supervision. Light work, on the other hand, usually terminates the surgeon's connection with the case, and this is then replaced by a sort of dual control on the part of the family doctor and the compensation doctor—often both pulling in opposite directions.

(3) For the reasons already stated, a very large number of cases which ought to recover do not, in fact, recover on light work. These cases then gradually become convinced of their permanent disability, and a psychological factor creeps in which is more difficult to dislodge than the actual physical disability itself. Rehabilitation as a second string in such cases is greatly prejudiced by the introduction of this psychological factor.

In such cases the work must be of a kind suitable to the condition of the patient and must have a definite remedial aim. To ensure this contact is obviously needed between the Fracture Clinic and the Management. The Surgeon in charge of the Clinic will be able to advise as to the stresses or strains that will be helpful or harmful, and the Management what kinds of work it may be possible to provide. The injured man should return at intervals to the Clinic for examination and report. This implies a close relation which unfortunately seldom exists at present between the Fracture Clinic and the Employers of the locality. The Almoner's Department can do valuable work here (see Chapter XVI below). The support of the workers' associations and representatives might also be enlisted with advantage in smoothing over difficulties with their own members. In a highly organised industry the presence of a man who is not capable of pulling his weight in the team hinders the others and may be resented by them.

In the past, provision of light work for an injured man has been too often regarded solely from either the compassionate or the compensation point of view. Its possibilities as a means of reconditioning injured men have so far as we have been able to learn, never been sufficiently explored. As stated in a previous chapter (VI), we are of opinion that it should be regarded from this point of view primarily in future and the system of workmen's compensation should be adjusted accordingly.

While we urge a thorough examination of the question, we do not suppose that the provision of light work will cover all the ground. The nature of the industry will make it difficult in certain cases, and generally speaking, it is no doubt easier for the larger enterprises to make such provision. On the other hand, there is evidence that in quite small works a feeling of comradeship makes the other workers ready to have the injured man back and help him along until his full restoration is effected.

To sum up, we are of the opinion that, under the conditions we have indicated, the completion of the process of rehabilitation by means of light work is a satisfactory, and, in a number of cases, the most satisfactory method; and we are hopeful, in view of the agreement expressed by the representatives of the National Confederation of Employers' Organisations with this view, that arrangements will be worked out between the parties interested, i.e., the Fracture Clinics, the employers and the workers for developing the method to its fullest possibilities.

When everything has been done in this direction that can reasonably be done there will remain a body of cases for whom no suitable work can be found.

What alternative provision can be made for these men? The problem is not the least difficult of the many which have arisen in the course of our inquiry but we feel no sort of doubt that it has got to be solved. Society will not be content to let such cases drift on without help, with all the risk of their becoming derelicts, any more than it has been content to do so in the case of those who have been crippled by disease or disabled by war. At the beginning of this chapter we referred to the difficulty and danger to the patient of the unoccupied interval which follows the termination of hospital control. Practically all the witnesses who referred to the point are agreed as to this. We may quote one who has had great experience in dealing with difficult cases which have been sent to him because they were making no progress or actually deteriorating. Dr. Moore of the L.M.S. Hospital at Crewe said:—

“ But there is no doubt about it the cure in quite a lot of them begins with their removal from their home surroundings. Their wives and families are often responsible for increasing the disorder in men already nervous and despondent. If they are not hitting it off at home and are being continually irritated or worried, or if on the other hand, there is undue sympathy the conditions are favourable for retarding recovery. Some of them get worried with the children about the place making a noise, and it makes them more irritable, others become self-indulgent for sympathy, in either case they sit about and do nothing. Therefore I think the aim should be to get them occupied and continually occupied, give them something to do, let them mix with other people who are normal mentally and get them interested ”.

The Stewart Committee stressed the same idea in the paragraph of their Report (Cmd. 5657 par. 28) dealing with the miner who has been certified as suffering from miner's nystagmus. They said:—

" The course of the malady thereafter depends almost entirely on the question whether the patient obtains light work as soon as he is able to undertake it. If he obtains such work his symptoms may be expected gradually to subside; but if he fails to get it the consequences may well be serious, for, left to his own devices, the man remains at home to " brood "; he often becomes progressively more introspective and neurotic, with the result that he may become unemployable ".

The gap must be filled, and if suitable light employment is not available, its place must be taken by other remedial activities, having an equivalent effect. There is not very much experience in this country to guide the Committee as to the way in which such provision should be organised. The experience gained during and after the war in the restoration of the working capacity of wounded soldiers in Sir R. Jones' curative workshops and Ministry of Pensions Hospitals is of great value as to *methods* of reconditioning*; but the scale on which, and conditions under which, provision had to be made differ widely from the peace-time conditions we have to consider. In a few cases, some large firms, which have realised the importance of this matter, have organised arrangements of their own, such as the L.M.S. Clinic at Crewe; and in one district, the Lanarkshire Coal Area, a joint arrangement has been made in which the coal owners and miners both share. We have learned much from Dr. Moore's experience at the L.M.S. Clinic at Crewe but a large proportion of his work lies with cases which are sent to him from other districts because their treatment has been inadequate and the results unsatisfactory, and it is therefore not quite relevant to the present question. The Royal Northern Hospital has recently opened a special rehabilitation department designed to meet the need to which we refer; but it has not been in operation long enough to provide any body of experience by which the Committee might profit. Apart from this and the Rehabilitation Clinic at the Albert Dock Hospital no Centre has up to the present, so far as we know, been established anywhere in this country for giving this "reconditioning" in accident cases.

Finally, we have obtained information as to the organisation and working of the Ministry of Labour camps for "reconditioning" unemployed workers and have visited two of them. Useful light is thrown by the Ministry's experience with these camps, but we doubt whether such camps, remote from the homes of the workers, would be a suitable method of dealing with the classes of case we are now considering.

* See memorandum on Curative Workshops in the Hospitals of the Ministry of Pensions, printed in Appendix H.

The problems ought not, however, to be difficult of solution. The reconditioning required in the majority of cases is a fairly simple matter of exercises, occupations, games and the like. Facilities and opportunities for these are available in most places and it ought not to be a difficult matter, in districts where cases needing this kind of reconditioning are sufficiently numerous, to organise regular courses which will provide the treatment needed. We are inclined to think that the great majority of cases of the type under consideration can be suitably dealt with in this way by means of daily attendance at non-residential centres. But it is essential that the arrangements be carefully organised and managed by some person appointed to be in charge of the centre and the persons needing the "reconditioning" continuously looked after; and it would be of the first importance that good relations should be established with employers in the district. The greatest inducement to the injured man to co-operate will be the knowledge that as soon as he is fit his job will be ready for him.

At the Albert Dock Hospital the Secretary of the Clinic is charged with the duty of keeping in constant touch with the employers to ensure that as far as possible the men's jobs are kept open for them or that other suitable employment will be ready for them; and similar duties are undertaken by the almoners of some hospitals. It would be an important part of the work of the Superintendent of any reconditioning centre to act as a liaison with the employer.

It has naturally occurred to us that the provision of such arrangements might be linked up with, and indeed form part of, the National Fitness movement which is being fostered by the Government. The object in both cases is the same. We have consulted with officials of the Board of Education and the National Fitness Council, and it appears to us that there would be great advantages if this could be arranged. The National Fitness Council does not itself set up and run fitness centres but works through local area Committees (22 in number in England and Wales) whose function it is to review the existing facilities for physical training and recreation in their areas, to enlist public interest, to encourage the promotion of local schemes, and to examine and report on any schemes submitted for purposes of grants. Schemes for such purposes as we have in view might be formulated in concert with the Board of Education (as the central Department) and propaganda undertaken through the area committees to get such schemes adopted and put into operation. Initiation in starting such schemes might be taken by various bodies—local authorities, hospital authorities, voluntary organisations, employers' and workers' associations—and in various ways. On their side the Area Committees in surveying the facilities for physical training

and exercise in their respective areas should, we suggest, bear in mind the special need of making provision for such cases and should get into touch with the hospital authorities with a view both to ascertaining the nature and extent of the facilities required and to arranging for advice and encouragement being given to the persons concerned to make use of them. We understand that most Local Education authorities employ qualified Physical Training Organizers who would be competent to advise on matters relating to courses or teachers in any particular locality. The courses would necessarily have to be on more intensive lines than the ordinary physical training course, in order to restore the man to his full capacity as quickly as possible.

We should perhaps add that the Education Department's Staff Inspector of Physical Training whom we consulted, expressed himself, in view of his war experience of convalescent depots for wounded men, as strongly in favour of residential centres—only in this way, he thought, can the men's time be so filled with outdoor sports and indoor occupations and amusements that they have no opportunity to brood over their disabilities or misfortunes.

The Joint Committee of the Trades Union Congress and the British Medical Association have placed before us a scheme for the establishment of such residential rehabilitation centres in connection with the fracture clinics. The scheme is based on the view already mentioned that 25 per cent. of the cases treated in the clinics will require this kind of rehabilitation. We think that it would be very desirable, especially for certain types of cases, if some experimental centres of this kind could be instituted; but until experience has been gained of the full scheme of treatment, including adequate physio-therapy and remedial exercises, which we have recommended, it would be premature to decide the extent or nature of the supplementary provision needed.

We particularly welcome the experiment which is about to be tried by the coal owners in the Midland area, of establishing a centre for the residuum of cases where a gap intervenes "between the termination of hospital treatment and the time at which the patient can be considered fit for ordinary work". Arrangements have been made to utilize part of a Convalescent Home near Mansfield, with grounds affording ample accommodation for outdoor games and other activities. A gymnasium is to be built; there are extensive gardens in which patients will be employed, and the equipment of a joiner's shop is planned. There will also be provision for indoor games, etc. The staff will consist of a Medical Director, a trained Physical Instructor, a Masseuse and a (part time) Secretary.

A proposal is under consideration, we are informed, for establishing a centre of this nature in Lancashire in connection with, and as a kind of annexe to, a group of Fracture Clinics, but a start has not yet actually been made.

We recommend that the Local Authorities when framing their schemes for fracture services in consultation with the Hospital Regional Councils should include provision for reconditioning, whether at Physical Fitness Centres, in special residential centres, or otherwise. If it should appear to the Ministry that there is need in any part of the country of such provision for reconditioning and that no measures are proposed for meeting the need, the Ministry should take up the matter with the local authorities.

It appears to us to be very desirable that arrangements should be made for one or more experimental centres to be started as quickly as possible. Several members of the Committee are strongly of opinion that this would be greatly facilitated by the Government undertaking to give financial assistance.

There remains the other class of case to which we have referred, namely, the case in which some "*functional*" disability is present. They are cases in which the obstacle to complete recovery is of a psychological nature and which are fully described and discussed in Chapter VI. In the absence of information as to the number of cases likely to require such treatment after the system of Fracture Clinics has been established throughout the country and the other changes that we indicate have been brought into effect, we are not in a position to make further recommendations on the subject.

It must not be overlooked that the problem is not simply confined to accidents in industry. Industrial accidents are probably only about a third of those that will be treated in the Clinics. Workers, at any rate, who meet with accidents involving a fracture outside their employment will be as much in need of treatment as those who meet with such accidents in the course of their employment. We think, however, that it will be safe to assume that the great majority, if not all, of the cases that require what we have called the third stage of treatment will be cases among industrial workers, whether or not the accidents occurred in the course of their employment.

In what we have said in this Chapter we have had in mind chiefly the question of fracture cases; but the principles indicated for adoption will apply with equal force to other classes of serious injury; and this, of course, will strengthen the case for the establishment of centres for reconditioning.

One important, indeed essential, factor in this matter is the co-operation of the injured man himself. We are confident that in the great majority of cases that co-operation will be forthcoming. Most men are anxious to get back to their normal work and life. But, and particularly in the second group of

cases we have been considering, the will-power may be lacking. It has been suggested that in cases in which compensation is being received under the Workmen's Compensation Acts, attendance at a reconditioning centre should be made obligatory. We do not recommend this. What is wanted is the willing co-operation of the patient and other means should be used to secure it. Unreasonable refusal to undergo the treatment which is necessary for restoration to health is a matter which the courts already have the power to take into consideration, when the question of compensation comes before them. We would place more reliance on the force of example and persuasion.

We recommend therefore—

(1) That systematic provision should be made for reconditioning (a) such cases as on discharge from the clinic need a course of "toning up" before they are equal to the strains and stresses of heavy manual work; and (b) cases in which complete functional recovery has not been effected in the hospital.

(2) That this in many cases can best be given by graduated work at the injured person's previous place of employment, and that the Departments immediately concerned should take up the question with the major industries of the country with a view to the thorough examination of the possibilities and to the organisation of systematic arrangements for the purpose.

(3) That for cases where such work cannot be provided, facilities for remedial activities should be made available. Such remedial activities might be provided in connection with centres established under the Government's National Fitness movement, or (as is being done in some cases already by individual firms or voluntary societies) at special reconditioning centres, or otherwise. The local authorities should, in preparing schemes for Fracture Services, in consultation with the Hospital Regional Councils, include arrangements for the provision of such facilities. It is very desirable that one or more experimental centres should be started as quickly as possible.

APPENDIX H.

MEMORANDUM ON CURATIVE (OCCUPATIONAL) WORKSHOPS AND CON-
VALESCENT TRAINING CENTRES AS PROVIDED BY THE MINISTRY OF
PENSIONS.*Curative Workshops in Hospitals.*

On the 1st May, 1922, some 30 hospitals under the control, direct or indirect, of the Ministry, provided facilities for occupational treatment. The instruction given was in no sense vocational; its object was to provide relief from the tedium of hospital routine, to secure the patients' interest in some form of useful activity and to help to restore the work habit.

The number of patients receiving Occupational Treatment at that time was 2,700 under 107 instructors, the subjects of instruction being:—

	<i>Patients.</i>
General Handicrafts (woodwork)	642
Upholstery and French Polishing	150
Outdoor Work	638
Surgical Appliance Making (including Surgical Boots) ...	216
Commercial Work	131
Sign Writing	72
Painting and Decorating	46
Engineering and Metal Work (including Surgical Appliances)	177
Basket Making	115
Brush Making	11
Tailoring	91
Leather Work	77
Printing	52
Rug Making	74
Electrical Engineering	17
Drawing	6
Miscellaneous Occupations	172

Part of the cost of these activities was recovered from the sale of articles made in the workshops and by the necessary repairs and work done in the hospitals by the patients. After allowing for these sales and for the value of the work done it was calculated that the net cost of occupational treatment, exclusive of the cost of adaptation of premises, amounted to 8·07d. only per patient per day.

REPORT ON TRAINING IN CONVALESCENT CENTRES.

Up to the 30th April, 1919, responsibility for the provision of vocational training for ex-service men who were precluded by reason of their disability from following their pre-war occupation, rested with the Ministry of Pensions, but by the Ministry of Labour (Transfer of Powers) Order of that year the powers and duties of the Ministry of Pensions for the training of disabled officers and men were transferred to the Ministry of Labour, "except so far as regards disabled officers and men in respect of whom, by reason of their special disability it is deemed necessary to provide training or employment under medical supervision or otherwise than under ordinary industrial conditions."

The cases reserved to the Ministry of Pensions were grouped as follows:—

- (a) Cases requiring treatment such as would interfere with regular attendance at a continuous course of training on industrial lines.
- (b) Cases where the man's physical condition or past history was such as to render it likely that he would break down in training or employment under ordinary industrial conditions.

(c) Cases where it was necessary that the man should reside at an institution in order to receive concurrent treatment and training.

(d) Cases where the nature of the man's disability was such as to make it impossible or undesirable for him to be trained in association with ordinary workers, e.g. severe facial injury, severe neurasthenia, epilepsy, etc.

The scheme initiated by the Ministry of Pensions for the training of such cases in Convalescent Centres where medical supervision would be available, was put into operation in 1919, when centres for concurrent treatment and training were opened at Blackpool, Epsom (1920), Birmingham (1920), Plymouth (1920) and Barry (1921), these institutions being known respectively as King's Lancashire Convalescent Centre, Queen Mary's Convalescent Centre, Princess Mary's Convalescent Centre, Queen Alexandra's Convalescent Centre and Prince of Wales Convalescent Centre.

It is necessary here to consider only the *training* activities of these Centres.

Considerations affecting Training.

At the outset the Ministry was confronted with the difficulty of adapting syllabuses of training to the varying needs of men at every stage of convalescence and it was at once clear that any scheme of training if it was to be successful must be of an elastic nature. The primary function of the Convalescent Centres was to restore health, and accordingly the training which was given in association with treatment had to be carefully graduated and adjusted to individual capacities. In some cases work might be continued with advantage for four or five hours a day, in others physical disabilities might limit the number of hours to one or two. In each case the number of hours training which could safely be undertaken was determined by the medical officers of the Centres and this number was increased *pari passu* with improvement in the health of the patients until the maximum of six hours was attained.

The selection of the type of instruction to be given in Convalescent Centres was further influenced by the fact that the responsibility of the Ministry of Pensions for training ceased when the need for treatment had expired. It was therefore essential that the scheme of training framed by the Ministry of Pensions should correspond closely with that of the Ministry of Labour on whom men had to rely for the completion of their training. Close collaboration with that Department was maintained and with one or two exceptions, dictated by special circumstances, no trades were introduced into Convalescent Centres in which corresponding classes did not already exist in the Government Instructional Factories of the Ministry of Labour.

Naturally the period of training which the Ministry of Labour was called upon to provide depended upon the amount of instruction which the patient had received concurrently with his treatment under the Ministry of Pensions. When the need for treatment ceased the instruction received under the Ministry of Pensions was assessed in terms of effective training and formed the basis upon which the need for further training was determined.

Attitude of Trade Organisations to Training in Convalescent Centres.

In framing the curricula for Convalescent Centres, the Ministry realised the importance of ensuring that there should be no objection to the proposed training from the Trade Organisations. In order that the training of disabled men might not conflict with the interests of employers and employed, the Ministry invited the co-operation of the National Trade Advisory Committees, which already existed in upwards of 30 of the principal trades, in considering the provision which might properly be made for instruction in those trades. For purposes of training, these

trades were designated "Special Trades." These Advisory Committees in consultation with the Ministry of Labour drew up the conditions under which training might be given in the industries they represented. They regulated the number of men to be admitted to training, basing their calculations on the probable number of openings which would be available in the trades. They prepared syllabuses to which the instruction must conform if it was to be recognised by them, and if the trainees who successfully completed their courses were to be regarded as eligible for membership of the appropriate Trade Unions. Their duties were to some extent delegated to the local Technical Advisory Committees which were set up in each Centre of industrial training. These local Committees interviewed all applicants for training and determined their suitability or otherwise; they satisfied themselves by periodic inspections that the instruction was being carried out in accordance with the requirements of the National Trade Advisory Committees, and when men were transferred from Convalescent Centres to the Ministry of Labour scheme they assisted in assessing the amount of effective training already received.

Cost of concurrent Treatment and Training.

It was estimated that the cost of this concurrent treatment and training, including maintenance, was roughly 7s. per day per patient.

Following this outline of the general policy of the Ministry of Pensions with regard to training, it may be useful to describe the activities of *one* of the individual Convalescent Centres, namely the Epsom Centre, as an example.

QUEEN MARY'S CONVALESCENT CENTRE, EPSOM.

Patients were admitted to this Centre in April, 1920, and instruction in the following trades formed the nucleus of the training to be provided: mechanical engineering (including oxy-acetylene welding), electrical engineering, cabinet making, upholstery, french polishing, carpentry, painting and decorating, wood machining, house mechanics. Before the end of the year classes were opened in commercial subjects (including arithmetic, book-keeping, shorthand, typewriting, office routine and business correspondence), preliminary technical subjects (comprising English elementary science, technical drawing and mathematics), brushmaking, basket making, fancy and heavy leather work, pig keeping, poultry farming, market gardening and arts and crafts, while rural hand crafts, hairdressing and the various processes of vehicle building were added later.

Although the Centre was originally designed to accommodate 600 patients only, it was soon evident that this accommodation was inadequate to meet the need of the area for concurrent treatment and training, and provision was accordingly made for 500 additional places, making a total of 1,100.

The difficulties which were experienced at Blackpool in connection with the teaching of "Special" trades and the transferring of patients to the Ministry of Labour were minimised at Epsom owing to the proximity of the Centre to London and the accessibility of the various National Trade and Local Technical Advisory Committees. These Committees were able to exercise a close supervision over the instruction, and periodical visits to the centre could easily be arranged. Even where it was inconvenient for the Committees to visit the Centre it was not a difficult matter to arrange for trainees to be interviewed in London itself at the Committee's headquarters. Naturally these advantages facilitated transfers of trainees to the Ministry of Labour scheme and up to the end of 1922, no fewer than 497 were accepted from this Centre by the Ministry of Labour for further training in "Special" trades alone. The most successful subjects from this point of view were carpentry, upholstery, tailoring and cabinet making with figures of 52, 48, 45 and 38 respectively. Although the mechanical and electrical engineering Advisory Committees were somewhat reluctant at first to recognise Epsom as a Centre for training in those trades, and

very little was consequently effected in the way of transfers for some time, they subsequently found themselves able to accept a limited number of men and much good work was carried out in these industries. The mechanical engineering shop was fitted with modern machinery, lathes, &c., and all classes of fitting and turning were taught together with instruction in acetylene welding and motor mechanics. The electrical engineering shop which provided instruction in switch gear fitting, electrical contracting, instrument making, testing, etc. was described by the visiting member of the National Trade Advisory Committee as "One of the best equipped training shops in the country".

A special rural handicrafts class designed to meet the needs of some of the older patients whose age precluded them from entering "Special" trades met with considerable success. The instruction given qualified the candidates to undertake odd jobs in furniture repairing, and the syllabus covered cabinet making, french polishing and upholstery. Very creditable results were obtained in the building trades which comprised the following sections:—carpentry, bricklaying, painting and signwriting, wood machining, house mechanics and builders' draughtsmen. A good deal of practical work was carried out by this section in the Centre itself. New piggeries and brick ovens for the kitchens were constructed by the trainees themselves, while the free use of notice boards and signs in the Centre provided practical work for the sign writers. The house mechanics course provided for men who were unsuitable by age or other reasons for training in a particular trade, the syllabus covering repairs to doors, windows, burst pipes, fittings, electric bells, telephones, etc.

A few specially selected men were prepared for the examination held by the Royal Sanitary Institute for Sanitary Inspectors, and more than 50 per cent. were successful. Owing, however, to the difficulty of securing employment in this profession, it was found necessary to disband the class. For a similar reason classes in chemistry and surveying were closed. A high standard of efficiency was reached in the hairdressing saloons which were well equipped with up-to-date appliances for training in all classes of hairdressing work. Several patients from this department were able to start business on their own account while many went direct from this Centre to employment as hairdressers.

The basket making shop was kept available as far as possible for men with high disabilities who required work of not too strenuous a nature. Results were highly satisfactory, and several fully trained patients were enabled on their discharge from the Centre to start in business on their own account. Leather work, both fancy and heavy, and tailoring, were equally successful, and the output of these classes compared most favourably in respect of workmanship with goods purchased in the open market.

Provision was also made for a very large number of patients who required outdoor training. Instruction was given in gardening, poultry keeping and pig keeping. The majority received training in all three subjects, but a few preferred to specialise in either poultry keeping or pig keeping. The latter subject proved so profitable that new piggeries were provided for further livestock.

Many successes were gained in the Royal Society of Arts' examinations by members of the commercial classes, while these classes also provided a special instructional course in business correspondence for all the trainees in the Centre with special reference to the particular trades which they were being taught. A prominent feature of the training side of the Centre was the Preliminary Technical Department. The aim of this Department was to correlate the training given in the workshops with the theory of tools and methods. A thorough grounding was given in technical and workshop drawing, and in trade calculation, and in addition a course of lectures was arranged on the evolution of tools and trades.

As in the case of the other Convalescent Centres excellent relations were maintained between the Centre and the Ministry of Labour, and everything was done by that Department to enable the machinery for transferring men to run as smoothly as possible.

IX—FINANCE.

In the course of our inquiry we have frequently had it put to us as a difficulty that the establishment and maintenance of a fracture service or clinic at a hospital will involve additional expenditure which the present resources of the hospital are insufficient to meet, and we have been asked whether financial assistance will be forthcoming. We have accordingly given much consideration to the question of the additional expenditure that may be entailed and the means by which it might be met.

Such a development as we are proposing is no unusual occurrence in the history of a hospital. The institution of specialized services has been a marked feature of hospital progress during the last 50 years or more, and comes about by natural process. Specialized methods of diagnosis and treatment of particular organs (e.g. eye or ear) or conditions are developed and become recognized by the medical profession: new departments are created, on the advice of the medical staff, by the hospital management, and the cost of their establishment and maintenance is met by the methods normally adopted by voluntary hospitals. This is the way in which the fracture services which already exist in a number of large hospitals have been created. The hospitals have established them in the ordinary course of the pursuit of efficiency, and maintain them as part of the normal hospital service.

It must also not be overlooked that, as recorded in the Hospital Year-Book for 1937, the latest returns show that over 600 hospitals had maintenance surpluses amounting, in the aggregate, to more than one million pounds. These surpluses are, in the normal course, devoted to the extension of hospital services and we are of opinion that the establishment of an organised fracture service has an urgent claim for consideration in connection with the use of these surpluses. We do not doubt that, left to develop in the ordinary way, the institution of fracture services would gradually become general throughout the country. As stated in a previous Chapter, the process has already begun. Interest is being aroused. Large sums are being contributed by private benefactors for the establishment of fracture services in particular places. Employers and their organizations are entering into arrangements with hospitals to secure the improved treatment for men injured in their employment. But the development is bound to be slow, and must inevitably be sporadic. Not all districts or hospitals are equally fortunate in the matter of private benefactions. Many hospitals labour under the strain of a recurring deficit. The urgent nature, in our opinion, of the demand for a reorganization of the treatment of fractures generally makes it important that the pace should be accelerated. We proceed to consider how this can be done.

In a previous Chapter we have set out in some detail the nature of the staff, accommodation and equipment required for fracture services of various degrees of importance (as judged by the number of cases treated). The expenditure for this purpose is not all new expenditure. The service will be the re-organization and development of service already undertaken by the hospital, not the creation of an entirely new service. A beginning can be made, in almost all cases, by some re-allocation of existing ward and other accommodation, redistribution of duties between the surgical staff, detailing of certain of the nurses for fracture work and so on. Use could be made to some extent of existing equipment, e.g. the X-ray department. We have seen at several hospitals beginnings made in this way and admirable work being done, sometimes under conditions of a makeshift and cramped nature.

So far as regards *accommodation*, we are satisfied that in a number of cases, perhaps many, there will be a difficulty in making satisfactory arrangements without an extension of the hospital buildings. Instances have come to our notice among the hospitals we have visited both in London and the Provinces.

It is true that the saving as regards in-patient accommodation which should be effected (*a*) by the increase in the proportion of patients treated as out-patients and (*b*) by a shortening of the period of treatment as the result of the new methods should reduce the strain on the hospital accommodation; but it is to be expected, and hoped, that the establishment of specialized services will lead to an increase in the number of cases sent to the hospitals where such services exist. This will be especially the case where under a regional scheme the fracture service for a large or populous area is centralized at a selected hospital. According to the evidence of the British Hospitals Association (England) this has been the experience of some fracture clinics already established; although the average stay at the hospital of the patient has been reduced, the number of new cases has increased so much as to necessitate the provision of more in-patient accommodation. (Incidentally this provides striking proof of the public appreciation of the services rendered to the community by the Fracture Clinics already established.)

Moreover, an important part of the treatment in a fracture service will, as we have pointed out in Chapter VI, be the restoration, by means of physio-therapy and remedial exercises, of the muscles, joints, etc. to their full functional activity. It is common knowledge that at many hospitals no facilities for this part of the treatment are provided or that, if they exist, they are already fully occupied. It is to be anticipated therefore that expenditure will be necessary to provide or increase the accommodation equipment and staff required for this part of the treatment.

As regards the *maintenance* cost of a fracture service, we have already indicated the staff required and the approximate annual cost additional to the present expenditure on staff. It would appear that (whether or not there is an increase in the number of patients) the average cost per patient may be considerably reduced as a result (a) of the greater proportion treated as out-patients and (b) the shortening of the period of treatment under the new methods.

We may quote the following statement made to us by the Hon. Surgeon of a considerable Provincial Hospital:—

“ The institution of efficient treatment of fractures has not, so far as I know, added in any way to the Hospital expenditure. Actually the reverse is the case for up to a few years ago it appears that the routine treatment for, as an example, a fracture of the tibia and fibula was to admit the case to Hospital, apply a “ back splint ” and keep the patient lying in bed for six weeks at least. He would then start to get up, and, if he was fortunate, he would leave the Hospital about a fortnight later, walking on crutches. Such a case would have cost the Hospital about £25—reckoning three guineas per patient per week as the average figure. With the modern methods I now use the cost to the Hospital for similar cases does not exceed 25s. od.”

On the other hand allowance must be made for the probable increase in the number of patients treated, developments in treatment and after-care.

To sum up, we anticipate that in many cases, but not necessarily immediately, expenditure on the provision of new accommodation will be necessary. It is of course impossible to frame any general estimate as to the amount of such expenditure but we see no reason to doubt—in fact, every reason to believe—that the need will be met by the benefactions of public-spirited individuals and general public support—as indeed is already happening at present. As regards cost of maintenance, we conclude that, on balance, an addition to the general expenditure of the hospital may be involved.

In this connection we should like to mention the large sums contributed from the Miners' Welfare Fund to the support of hospitals in the mining areas. These amounted up to 31st October, 1936, to £350,793 for buildings and equipment and £60,047 for endowment. The total amount contributed up to the end of 1938 was £444,480.

We proceed to consider some suggestions that have been made to us as to possible sources of new revenue for meeting the *additional* maintenance expenditure—which alone, and not the total cost of a fracture service, is now in question.

It has been pressed upon us from several quarters that a charge (either equivalent to the whole or part of the actual cost of treatment in the particular case or at a flat rate) should be recoverable by the hospital from any parties who benefit financially by the improved results and reduction in the period of disability or from any parties liable in any way for the causation of the accident.

We have distinguished in an earlier Chapter three groups of cases, namely, accidents to employed persons for which compensation is payable under the Workmen's Compensation Acts (we refer to them for brevity as industrial accidents), road traffic accidents; and miscellaneous accidents among the general population.

Suggestions have been made by witnesses in regard to these three groups as follows:—

(a) In the case of industrial accidents the charge should fall on the employers or on the insurance societies which insure the employers against their liability, as the benefit from the reduction in the period for which compensation is payable accrues to them.

(b) In the case of road traffic accidents in which motor vehicles are involved, the limits of £50 in the case of an in-patient and £5 in the case of an out-patient, which are imposed by Sec. 33 of the Road and Rail Traffic Act, 1933, to the amounts payable to a hospital for treatment, should be abolished.

(c) As regards the miscellaneous group, it has been suggested that, so far as persons insured under the National Health Insurance Acts are concerned, a contribution should be made from Insurance Funds towards the treatment of insured persons; and as regards other persons, not in a position to contribute from their own resources or as members of contributory schemes, by the local or public assistance authorities.

We have examined carefully each of these suggestions. Before we discuss them it will be convenient to say something of the practice of hospitals in regard to recovery from patients of a contribution towards the cost of their treatment. In some cases hospitals are debarred by their trust deeds or their tradition from requiring or inviting such contributions even from patients in well-to-do circumstances and we have heard of cases in which well-to-do patients have received treatment without offering to make any return. We are advised that apart from an agreement expressed or implied by the patient or his friends to pay for his treatment, a hospital has no legal right to recover the cost, but we are strongly of opinion that means should be

found for ensuring that patients who can pay should pay. The Voluntary Hospitals (Paying Patients) Act of 1936, which gives power under conditions to hospitals restricted by their trust deed or otherwise to provide "pay-beds," goes some way in this direction. In general, however, a considerable proportion of the cost of treatment (including nursing and maintenance but not the services of the consulting staff) is recovered either through the activities of the almoner's department or on the basis of agreements between the hospital and the patient, or friends of the patient, at or after the time of his admission, or through contributory schemes. The total amount received by the Voluntary Hospitals, either in this way or through contributory schemes, forms a large proportion (estimated at a little less than 50 per cent.) of the income available for maintenance. A note on contributory schemes is appended to this chapter.

Industrial Cases.

The suggestion that a charge in respect of the treatment of a workman injured in the course of his employment should be recoverable from the employer is not entirely new. Two Departmental Committees have recommended it.

The Home Office Committee on Workmen's Compensation of which Mr. (now Sir) Holman Gregory, K.C., was Chairman (1920) recommended that any medical and surgical aid necessary in addition to the medical treatment already available under the National Health Insurance Acts should be provided for an injured workman at the cost of the employer because the need for such extra services "has been created directly by the risks of employment and they will have a material effect in reducing the amount of monetary compensation payable under the Workmen's Compensation Acts." The Ministry of Health Committee on the financial position of Voluntary Hospitals of which Lord Cave was Chairman (1921) recommended that pending, or in default of, the adoption of some such proposal, the Courts should be authorized to include in an award under the Employer's Liability or Workmen's Compensation Acts a reasonable sum, to be recoverable by the Hospital, for the cost of treatment in hospital, the Court in framing such an award to have regard to any recent contribution by the employer to hospital funds. Effect has not so far been given to those proposals.

These proposals covered the whole field of the Workmen's Compensation Acts, and the whole cost of the medical and surgical treatment of the injured workman outside the scope of the National Health Insurance Acts. We are concerned with a much more limited question, namely the financing of the establishment and maintenance of services for the treatment of fractures and allied injuries.

As the terms of reference to the Committee cover all kinds of injury by accident and all measures necessary for the restoration of working capacity, it would perhaps be within the scope of its mandate to submit recommendations covering an equally wide field. But, for the reasons we have given, we think that the best course, in the first instance, is to concentrate on the provision of Fracture services.

On several grounds, we have come to the conclusion that we cannot support the suggestion that a special liability should be placed on the employer in respect of the treatment of an injured worker in a Fracture Clinic. For one thing, to impose the liability would involve an amendment of the Workmen's Compensation Acts, and any alteration of the law in the direction suggested would inevitably raise the question of the employer's liability over the whole range of injuries by accident. Not only would this have taken us very far afield but the decision of the Government to appoint a Royal Commission to inquire into the whole subject of the operation and effects of the system of workmen's compensation, including the relation of this system to arrangements for the treatment of injured workmen and the restoration of their working capacity, made it unnecessary for us to pursue the matter.

It is only right also in this connection to record the generous support which is already given by very many employers to the local hospitals in connection with "works" contributory schemes and otherwise, and, in particular as regards the establishment of fracture clinics, the interest that employers and employers' associations are taking in the matter and the very considerable sums some are contributing for the purpose. We should not wish to see anything done to lessen the employers' interest; and any proposal that might have this effect would need to be very carefully weighed.

The other suggestion that was submitted to us was that the Accident Insurance Companies, as parties presumably having a financial interest in the methods and results of treatment of accident cases, should be called upon to contribute towards the support of fracture clinics. In so far as witnesses contemplated that a legal liability should be placed upon the insurance companies, the suggestion would seem to be based on some misconception of the position. Any charge placed upon an insurance company is in effect a charge placed upon those who insure with the company, as it would necessarily be reflected in the premiums they would be called upon to pay; such a charge could not be placed, indirectly, in this way upon insured persons when no similar charge is placed upon the many uninsured. On the question of principle involved, it has been pointed out to us that the question of calling upon insurers to contribute towards the cost of public services which

may reduce losses has been considered on more than one occasion and it is contended that the conclusion of the Royal Commission on Fire Brigades (1923) is applicable to the present suggestion; viz.:—

“ So far as any question of principle is concerned, there appears to be no more reason for the Fire Department of an Insurance Company to subsidize Fire Brigades than for the Marine Department to subsidize lighthouses or for the Burglary Department to subsidize the Police.”

It is not denied that the Accident Insurance Offices have got a very direct interest in the establishment of fracture services. The representative of the Accident Offices Association who appeared before the Committee said:—

“ We take a very great interest in anything that will reduce our claims cost, whereby I mean reduce the period of disability of the workman . . . It operates like this. Our premiums are fixed on the cost of claims. We rate our business by taking the experience broadly trade by trade and . . . the lower the claims the more we can reduce our premiums which is all to our advantage; it improves our business.”

We may quote, too, the following extract from the presidential address given before the Insurance Institute of London on the 4th October, 1937, by Mr. A. G. Sweet, General Manager of the Guardian Assurance Company, as reported in the “ Times ” of 5th October, 1937:—

“ In the past insurers had been actively concerned in the encouragement of safety measures in factories, as elsewhere, and they had thus materially reduced the loss ratio and increased, in proportion, their expenses. No one had the interest of workmen more at heart than insurers, and they had shown a real sympathy towards schemes for the rehabilitation of injured employees so as to facilitate their early return to employment. In this world it was impossible to have things both ways, and while it was probable that insurers would be prepared to expend money in the establishment and maintenance of clinics for the after-care of injured workmen—a matter of good business for insurers, employers, and workmen alike—their outlook was naturally influenced when they were required to disperse in actual claims a fixed proportion of their gross premium.”

The reference in the last two lines is, presumably, to the arrangement in force between the Home Office and the Accident Offices Association whereby the ratio which the amount paid in

any year by all the companies combined in compensation or damages for injuries to workmen (including reasonable legal and medical expenses) should bear to the total amount received as premiums in that year has been fixed at $62\frac{1}{2}$ per cent.; a corresponding rebate being allowed to the employers in the following year when the amount so paid falls short of that percentage by more than $\frac{1}{2}$ per cent.* In each year since the arrangement came into force, the ratio of losses to premiums has fallen short of the percentage fixed.

In the United States of America insurance companies have, according to our information, actively interested themselves in the treatment of injured workmen covered by their insurance.

It can be contended, no doubt, that contributions by the Accident Offices towards the establishment or maintenance of fracture or other accident services would be at the expense of the employers insured with those offices and would enure to the benefit equally of employers not so insured and making no such contribution.

We do not see our way to make any recommendation. The matter is one for the consideration of the Accident Offices.

Road Traffic Cases.

The Road Traffic Act already recognizes, though only to a limited extent, the principle of re-imbursing the hospitals for the cost of treatment of road traffic accident cases. Where the accident is one for which the motorist is responsible, the Act provides for payment up to a maximum of £5 for out-patient cases and £50 for in-patient cases. Nothing is recoverable in the case of accidents for which the motorist is not to blame, or for accidents to the motorist himself or a passenger, beyond a fee of 12s. 6d. recoverable from the person using the car in respect of *emergency* treatment given to any person injured in a motor accident. Strong representations have been made to us as to the burden which falls upon the hospitals in connection with these cases. We are informed by the Central Bureau of Hospital Information that it may be calculated with a considerable measure of certainty that the treatment of road accidents costs the voluntary hospitals of the Kingdom something in the neighbourhood of £200,000 a year and that they are now recovering rather more than half the cost. The burden presses with special heaviness on many of the smaller hospitals in rural areas which are called upon to treat large numbers of injuries to persons having no connection with the locality for which the

* The terms of the arrangement are set out in a Command Paper of 1923 (Cmd. 1891) and each year a return is presented to Parliament showing the operations of the arrangements in the preceding year.

hospital is provided. One hospital in the Eastern Counties informed us that road cases cost it £2,000 a year, of which only about £600 was recovered.

It is not easy to understand why if a liability in respect of the cost of treating the injured persons is to fall on the motorist, the liability should be subject to arbitrary limits. There seems to us no justification whatever for allowing the motorist to impose on a charity any financial burden in respect of an accident for which he was responsible and we recommend that the limits should be removed.

Miscellaneous Cases.

We now pass to the group of miscellaneous accidents which is much the largest, accounting over the country as a whole for perhaps 55 per cent. of the cases, though as between different areas (rural, industrial, etc.) the proportions will vary considerably. As mentioned above a large number of the cases in this group which are treated in the voluntary hospitals will be partly provided for under the Contributory Schemes, or by payments received from the patients through the activities of the almoner's department, or by arrangement between the hospital and the patient, or friends of the patient, on his admission.

A large number also will be persons who come under the National Health Insurance Acts and the suggestion made to us that Approved Societies should, out of the funds at their disposal for additional benefits, contribute to the additional cost of the hospital treatment of their members in a Fracture Clinic seems reasonable. Some of them already do so, but the matter appears to be left to their discretion and the payments made represent only a fraction of the cost of treatment. The position in regard to the Approved Societies is set out in a Note to this Chapter. Any improvement in treatment which reduces the length of the sickness period constitutes a relief to the funds of the Approved Societies. We are not in a position to make any definite recommendation because large questions of policy beyond our competence are involved but we commend the suggestion to the consideration of the Ministry of Health.

Similarly as regards cases which fall within the sphere of the Public Assistance Authorities, particularly those where permanent disability may arise from inefficient treatment, it would seem to be in the interest of those authorities to contribute to the cost of treatment in an efficient clinic. This too is a matter on which we do not feel qualified to submit any definite recommendation; and the suggestion is, in part at any rate, covered by the proposal we make in regard to the part to be taken by the local authorities in the provision of fracture services.

Conclusion.

Useful as the aid to be derived from the different sources indicated in respect of these three distinct groups of cases may be, they are neither certain enough nor sufficient to ensure the support that may be needed to create without undue delay the network of Fracture Services throughout the country that is the object of our inquiry.

Without wishing to trespass on the general field of Hospital Finance which has recently been dealt with by the Voluntary Hospitals Commission of the British Hospitals Association of which Lord Sankey was Chairman, we think the question of financial support for the establishment and maintenance of Fracture Departments should be approached in another way.

The procedure that the Committee has recommended to secure the establishment of such a network of services is that the public hospital authority for any area, i.e., the County Council or the County Borough Council, should be invited by the Government to take the initiative in drawing up a scheme in consultation with the voluntary hospitals and other interested bodies.

If it is agreed as the result of such consultation—and as will probably happen in most cases—that the main provision of Fracture services for the area should fall upon the voluntary hospitals and that their financial resources will be insufficient to meet the cost of providing an effective service, there would, in our opinion, be a strong case for the local authority making an annual contribution, or increasing the contribution already made, towards the cost of maintenance of the Fracture Departments of the hospitals in its area. They have power to do this up to the limit of a rate of one and one-third pence in the pound, under section 181 (3) of the Public Health Act, 1936. We would recommend that the Ministry of Health should, by administrative action, take all possible steps to promote a solution of the problem on these lines. If, as we are informed, the cost of providing the additional salaries proposed under our scheme is what is chiefly deterring many hospitals from establishing a full fracture service, a grant from the local authority to cover the cost of the salaries would be perhaps the most useful form a contribution from them could take.

In Scotland the position is different in so far as there is in that country no legal power corresponding to section 181 (3) of the Public Health Act, 1936, and we suggest that the Department of Health for Scotland should give early consideration to the best means of securing a similar approach there.

Where the local authority makes such a contribution the expenditure would rank amongst the items on which Exchequer assistance in the form of a Block Grant is calculated. We append a note (Appendix J) showing the way in which the block grant is calculated and allocated. Further, the reduction in the amount of disability arising as a result of fractures should be accompanied by some saving to Public Assistance and Public Health funds, which may be regarded as some offset to the local authority's contribution.*

We believe that if a strong lead is given in this way the public appreciation of the necessity for the institution of the services we recommend, and of the reduction which it should bring about in the amount of disability, temporary or permanent, resulting from accidents, as well as of the mitigation of the consequences that flow from such disability, will secure the measure of voluntary support that is needed. Should our expectations not be realized the whole position would need reconsideration for it would mean that the voluntary system was unable to supply the service; and if, as we think, the service is imperatively necessary there would be no alternative but direct intervention by the public authority, national or local.

* Where the local authority itself provides a Fracture Service, no special questions of finance arise. The expenditure falls on the rates (assisted by the Exchequer in the form of a Block Grant) except in so far as the cost or part of the cost of in-patient treatment is recovered from the patients (see section 184 of the Public Health Act, 1936). We append a note on the powers of the local authorities.

APPENDIX I.

CONTRIBUTORY SCHEMES.

Hospital Contributory Schemes are voluntary organisations under responsible management for the collection of regular contributions on definite scales, primarily from wage earners and others of limited means, with the double purpose of (a) assisting in the maintenance of voluntary hospitals (b) assisting the contributor by meeting the cost of his maintenance or the maintenance of his dependants in hospital.

Broadly speaking, Contributory Schemes fall in one of two categories, namely:—

(1) Schemes administered by independent bodies operating in a definite area.

(2) Schemes administered by individual voluntary hospitals.

Generally speaking, the class of people for whom the Schemes cater are the people who receive treatment at a voluntary or municipal hospital. A number of schemes (in both of these classes) have adopted income limits for membership; others have not fixed such limits; but membership of a contributory scheme does not give any right or title to contributors to admission to and treatment in a voluntary hospital, nor any priority right in regard to order of admission, and it rests with the hospital authorities to decide whether an individual can be accepted as an ordinary patient or not. If it is decided that the member must go into a private ward the Scheme "will make a refund of what he would have had, had he been an ordinary patient." On the other hand by helping with a refund a Scheme enables some people to go into private wards who would otherwise not be able to afford it.

The British Hospitals Contributory Schemes Association which was inaugurated in 1930, at present comprises 130 schemes with a membership of about 6,000,000 contributors. Counting contributors' dependants, it is estimated that the number of persons covered by the 130 Schemes is in the neighbourhood of 12 million.

There are many contributory schemes not affiliated to the Association, and there are important areas of the country where, so far as is known, there are no contributory schemes at all. The Association is working hard to get the whole country covered and we were informed in evidence that the movement is making rapid progress.

The rate of weekly contribution varies somewhat in the different schemes, and the average is about 3d. per week. Many employers have agreed with their workpeople that their contributions shall be collected by deductions from their wages. This greatly facilitates the working of the Schemes and the Sankey Commission has recommended that employers generally should be invited and encouraged to do so. Many employers also add a percentage on the amount so collected or contribute a fixed sum. It was pointed out to us that employers found it more convenient to pay a quota to a central fund in this way rather than allocate a sum of money for the benefit of their employees and then have the trouble of dividing it up among possibly a large number of different contributions. The total collections of the Associated Schemes amount to about £3,321,000 per annum.

Generally, the policy of independent contributory schemes in regard to the payment for treatment of patients may be summarised by quoting the practice of the largest provincial scheme (The Birmingham Hospitals Contributory Association), which we understand may be regarded as fairly typical of the independent schemes.

The aim of that scheme is to make good to the hospitals treating contributors, as large a proportion of the cost of the contributor's *maintenance* as possible. The cost of maintenance per day as in-patient is arrived at

from accounts prepared on the lines laid down by the King Edward's Hospital Fund for London. The hospital receives from the contributor a voucher issued by the Association, and these vouchers are sent in to the Association as a claim by the hospital, quarter by quarter. The Association then distributes the available funds pro rata, the proportion recently paid amounting to about 86 per cent. of the claims. Each hospital thus gets the appropriate percentage of the cost of maintenance for every day the contributor was in hospital, *and is thus paid in proportion to the work it has done*. Out-patient treatment is paid for on a similar basis.

The system of "Costing" adopted covers all forms of service and treatment at the hospital, and the Association has not recognised special forms of treatment, however expensive they may be, as entitling to payment at higher rate or to priority or preference in any way. If the hospitals were to incur special expenditure for the maintenance of fracture clinics, such special expenditure would rank as an item of the total cost of the hospital services from which the daily cost of maintenance—in-patient or out-patient—would be calculated on the lines indicated above.

We were informed in evidence that the hospitals accept the contributory Schemes voucher in full discharge of the cost of treatment and that it is one of the attractions of the Scheme to a contributor that he is immune from any inquiry and will not be asked to make further payment if he or any member of his family receive treatment in a hospital.

Reciprocal arrangements are in force generally, so that wherever a contributor is treated, whether in his own district or elsewhere, the scheme will pay towards the cost of his treatment.

Payments are also made for other services such as district nursing, conveyance by ambulance, convalescent or other forms of treatment, assistance towards provision of artificial limbs.

APPENDIX J.

POWERS OF A LOCAL AUTHORITY TO PROVIDE OR SUBSIDISE HOSPITAL TREATMENT.

[ENGLAND AND WALES.]

In addition to ordinary Poor Law powers the following powers exist in the Public Health Act, 1936, which consolidated earlier statutes on the subject, with some modifications:—

(a) Subsections (1) and (2) of Section 181 enable county councils and local authorities, i.e., the councils of boroughs and of urban and rural districts, to provide hospital accommodation including clinics, dispensaries and out-patient departments, for persons in their county or district who are sick.

Note.—Section 271 of the Act interprets the word "provide" as including a power to equip the premises and a power to enter into agreements with any other council or person for the use of suitable premises or equipment provided by or under the control of that council or person and the services of any staff employed in connection therewith.

(b) The expression "hospital accommodation" in Section 181 is a very wide one and it is considered that this Section also enables county councils or local authorities to enter into agreements with voluntary hospitals by which the voluntary hospitals would undertake to receive patients sent to them in return for either a periodical payment, which might be per bed or patient, or a lump sum payment, or a combination of the two.

(c) Subsection (3) of Section 181 enables county councils and local authorities to make reasonable donations or subscriptions to voluntary hospitals or institutions apart from any agreement for the reception

of patients, subject to a limitation that the total annual expenses incurred by the Council under the subsection shall not exceed a sum equal to a rate of $1\frac{1}{2}$ pence in the pound or such higher rate poundage as may be approved by the Minister of Health.

In connection with the exercise of the powers referred to in (b) and (c) above the Minister has on rare occasions sanctioned loans in respect of capital grants by local authorities to voluntary hospitals.

The Act of 1936 does not apply to the administrative County of London. For the powers of the London County Council and sanitary authorities in London, reference should be made to Part X of the Public Health (London) Act, 1936. The powers are generally similar to those of the general Act of 1936 above quoted, but with some variations, due to the fact that the London Act, unlike the general Act, was one of pure consolidation.

Municipal Hospitals.

These institutions are normally provided by County Councils or County Borough Councils and consist of:—

(a) *Infirmaries* which before 1930 belonged to the Poor Law Guardians and have since been appropriated by the Councils as hospitals under the Public Health Acts, together with some new accommodation built under these Acts. (Many of these institutions are comparable with first-class voluntary hospitals.)

(b) *Poor Law Hospitals* which are still administered under the Poor Law Act, but are separate hospital buildings and are sometimes indistinguishable outwardly from those under (a).

(c) *Sick wards* in Poor Law institutions (workhouses), of varying quality.

A. Capital Cost.—The Local Authorities mentioned above have power to build and equip hospitals, clinics or out-patient departments under the powers conferred on them by the Public Health or Poor Law Acts. Normally this involves application to the Minister of Health for sanction to raise a loan of the appropriate amount, and the Minister, before giving his sanction, satisfies himself that the plans are suitable and the cost reasonable.

B. Running Costs.—These are met in the first instance as a charge on the rates, but the Authority is under a statutory duty to recover the cost of maintenance and treatment in a residential institution from the patient, or his estate if he has died, or his liable relatives according to their ability to pay. A reasonable charge for transport can be included. There is probably no legal power to recover the cost of treating out-patients except on a contractual basis.

The net cost to local authorities is met partly out of the Block Grant, which is an Exchequer contribution in aid of local government expenses as a whole and cannot be apportioned to individual services, and partly out of local rates. As explained below the amount of the Block Grant for the whole country is related to the aggregate amount of the expense of local authorities, but the grant of any individual authority does not depend on that authority's expenditure.

The Block Grant system was set up by the Local Government Act, 1929, and came into operation on the 1st April, 1930. The Act provided that Parliament should vote annually for distribution to local authorities an amount called the General Exchequer Contribution and that this annual amount should be revised at certain intervals called "fixed grant periods." The Act further provided that in the second and subsequent grant periods the annual amount of the General Exchequer Contribution so provided should not be less than a certain proportion (approximately 23 per cent.) of the aggregate expenditure of all local authorities falling to be met by

rates and grants out of the General Exchequer Contribution in the penultimate year of the previous grant period. Thus the annual amount of the General Exchequer Contribution (£46,172,000) for the third fixed grant period of five years which began on 1st April, 1937, was determined (subject to certain adjustments which need not here be gone into) by the total of such expenditure in the year 1935-6.

The General Exchequer Contribution is, under the Act, apportioned among counties and county boroughs not by reference to the expenditure of the area but in proportion to the "weighted population" of the area save that in the first four grant periods a certain progressively diminishing proportion is apportioned by reference to the amount which the area lost by derating and the withdrawal of certain percentage grants which were replaced by the Block Grant. [The weighted population of an area is intended to represent its relative need for exchequer assistance. It is calculated by taking the basic population of the area and weighting that figure by reference to certain factors, namely the number of children in the area under five years of age; the rateable value per head; the volume of unemployment; and, in the case of counties other than London, sparsity of population.]

Any contributions to voluntary hospitals maintaining fracture departments which may be made by a local authority in the *penultimate year* of the current or a succeeding fixed grant period would accordingly tend to increase the total amount of the General Exchequer Contribution for the next succeeding period. Local authorities' expenditure from year to year is, however, subject to many changes (plus or minus) and the effect of this particular item on the aggregate expenditure would no doubt be masked. Contributions made in years other than the penultimate year of a grant period (the next penultimate year will be 1940-1) would have no effect on the Block Grant.

It must also be borne in mind that, inasmuch as the Block Grant is apportioned among counties and county boroughs in proportion to weighted population, even if these contributions to voluntary hospitals caused such an increase the particular local authorities which had incurred the additional expenditure would not necessarily be the ones which would receive an increased grant.

The method of distribution of the grant can only be altered by legislative authority. Some modifications were made in the original method of distribution by the Local Government (Financial Provisions) Act, 1937, and certain matters connected with the distribution of the grant will again come under review towards the end of the current grant period, i.e., before April, 1942.

APPENDIX K.

NOTE ON APPROVED SOCIETIES (ENGLAND AND WALES).

Approved Societies.

Considerable numbers of members of Approved Societies are admitted for treatment in voluntary hospitals: and in certain circumstances payments may be made to the hospitals by Approved Societies. Such payments in respect of individual members may be of two kinds (1) Sickness or Disablement Benefit, and (2) Hospital Benefit.

(1) *Sickness or Disablement Benefit.* (Sections 32 and 55 of the *National Health Insurance Act, 1936.*)

Sickness or Disablement Benefit under the National Health Insurance Act may not be paid direct to the insured person while he is an inmate of a hospital, but in so far as it is not paid to his dependants, or applied to provide comforts for him, or to defray expenses for which he is liable

otherwise than to the hospital, it may, with his consent, and at the discretion of his Approved Society, be paid in whole or in part to the hospital.

Sickness or Disablement Benefit is not, however, payable for incapacity due to an accident or industrial disease for which the insured person has received or is entitled to receive compensation under the Workmen's Compensation Act or damages at Common Law, except where the amount of compensation or damages is less than the amount of benefit which would otherwise have been payable, in which case the difference between the two amounts is the amount payable as benefit. (Section 51 of the Act.)

(2) *Hospital Benefit, "Additional Benefit No. 10" under the National Health Insurance Act (Section 104 and the Third Schedule).*

Hospital Benefit is defined as "payments to hospitals in respect of the maintenance and treatment therein of members, and the payment of the whole or any part of the travelling expenses incurred by or in respect of members in travelling to and from hospitals".

The benefit can be provided only by an Approved Society which, on valuation, has been found to have surplus funds, and has included this particular benefit in its Scheme of Additional Benefits.

It is to be observed that the benefit is limited to such treatment as is given to members as in-patients of hospitals, out-patient treatment not being within the scope of the benefit.

The Society's payment to the hospital is normally on the basis of a fixed sum per week for each member who receives treatment therein.

The sum set aside for the purpose of this benefit in 1938 by Approved Societies in England was £92,500.

The National Health Insurance Act does not preclude an Approved Society from making a payment of hospital treatment benefit on the ground that the member concerned has recovered compensation or damages in respect of the accident which necessitated the treatment in hospital. Under Article 18 (2) of the Additional Benefits Regulations, 1930, which govern the administration of additional benefits, a Society may, in determining to what extent a treatment additional benefit such as Hospital Benefit shall be granted in a particular case, have regard to the fact that it is competent to the member to obtain the treatment, or a contribution towards the cost thereof, from some other source otherwise than by way of charity.

In addition to making payments to hospitals in respect of individual members, Approved Societies may also make occasional subscriptions or donations to hospitals out of surplus funds.

Such donations or subscriptions differ from "Hospital Benefit" referred to above by being charitable gifts, and they cannot be earmarked for the specific purpose of defraying the cost of treatment of any individual members of the Society. The donations and subscriptions of this kind made to hospitals by Approved Societies amounted in 1938 to some £20,000.

Another additional benefit (No. 16) is defined in the Third Schedule to the National Health Insurance Act as "payments to approved charitable institutions in respect of any treatment of members required for the prevention or cure of disease, not being treatment within the scope of any other additional benefit or of medical benefit." It is used to enable Approved Societies to make payments in respect of members who receive treatment at certain approved clinics for the treatment of rheumatism or allied complaints. At the present time only two such clinics have been approved in England, although applications for approval from other institutions are now under consideration.

The sum set aside for the purpose of this benefit in 1938 by Approved Societies in England was over £34,000.

X.—LONDON.

The organisation of a scheme of Fracture Services for London presents a special problem by reason of the extent and conditions of the area to be served; the number of cases dealt with; the number of the Voluntary General Hospitals (37) and the concentration of most of the leading ones in or near the central district; the existence side by side with these, within the county, of an important and developing group of Municipal Hospitals (28); and the dependence to a great degree of the thickly populated outlying areas of greater London on the central hospitals of the County. Further, as a Teaching Centre, London is of paramount importance—12 out of the 34 Medical Schools in Great Britain are located in London; and the capital city is the only possible centre for such a central institution for post-graduate study and research in the treatment of fractures and other injuries as we have recommended in another chapter.

All these considerations impressed us with the need of working out a comprehensive scheme in which both the voluntary and the municipal hospitals would find a place and which would provide services reasonably convenient to all parts of the area, and without detriment to the teaching facilities.

It appeared to us that it should be possible, given the acceptance of the principles in regard to the treatment of fractures on which the recommendations in this Report are based and given, also, co-operation between the parties interested, to work out a scheme by which (*a*) Fracture Services would be established at hospitals in positions central for different parts of the Metropolis, so that there should be at least one such service within easy reach of any inhabitant, and (*b*) the smaller hospitals, both within the County and in the outlying areas of Greater London, could be linked up with those Fracture Services.

It appeared to us also to be important to minimize overlapping between the different hospitals and so avoid waste of effort, time and money. The total number of new fracture cases treated in the London Hospitals in 1935 was 32,572. Of these, the 12 Teaching Hospitals treated 9,887 (2,170 as in-patients); the 25 other Voluntary General Hospitals 9,441 (1,509 as in-patients); the 14 Voluntary Children's Hospitals 446 (125 as in-patients); the 28 Municipal Hospitals 11,289 (5,870 as in-patients).

We accordingly proposed to the Committee which represents the London Voluntary Hospitals and to the London County Council that a conference of the two bodies should be arranged with a view to the consideration of the problem as a whole and

the preparation of such a scheme. Though the proposal was accepted and representatives of the two bodies have met and discussed the matter, little, if any, progress has been made; and we are afraid that one cause of this is that the voluntary hospitals of London are—not all, but many of them—lagging behind in the movement for the reorganization of fracture treatment, when they ought—the Teaching Hospitals in particular—to be giving a lead. Of the 12 Teaching Hospitals only four have fracture services organized on the lines recommended in this Report, and of the other Voluntary Hospitals in London only two. In some, measures which go part of the way have been introduced; in the remainder little or nothing has been done. We direct attention elsewhere in this Report to the inadequate training of medical students in the treatment of fractures.

In the meantime the Municipal Hospitals Authority has been developing its own Fracture Services. The history of the development of its Services and the present position are described in the following note which has been supplied to us by the Medical Officer of Health of the County:—

With two exceptions cases of fracture are admitted to and treated in all the general hospitals of the London County Council. Every patient suffering from a fracture who requires in-patient treatment is admitted immediately application is made. A considerable number are referred from voluntary hospitals.

The total number of cases admitted is considerable. In 1937 it amounted to 6,519 patients. The actual number admitted to individual hospitals varies very considerably, being influenced by the locality in which the hospital is placed and the proximity of voluntary hospitals.

The treatment of fractures has been gradually developed and improved. In a number of the larger hospitals units have been formed in which, although they may not be actually designated fracture clinics, the main principles which are generally accepted as governing the organization of such clinics have been already followed. Thus the patients are segregated in special wards. They are under the care of resident surgeons possessing special skill. After discharge they attend the out-patient department where their treatment is continued under the same surgeon. Visiting orthopaedic specialists give advice and assistance in cases of difficulty, or, in some instances, exercise supervision over the treatment of all the patients.

The Council has since 1936 given particular consideration to the treatment of fractures in its hospitals.

In that year, following the report of the British Medical Association on Fractures, a detailed investigation was made into the organization and treatment of fractures in the general hospitals. This included a survey by Professor Hey Groves who had expressed a desire to study fracture practice in the municipal hospitals of London.

The investigation showed that the arrangements throughout the hospitals were generally speaking satisfactory, while Professor Hey Groves reported from his personal observations that "the general standard of treatment of fractures is very good and compares favourably with that met with at most voluntary hospitals, even those of teaching status".

Nevertheless, in the case of certain of the hospitals, the number of patients treated was too small to justify segregation or to ensure that the medical and nursing staffs obtained the experience necessary if the highest standard of treatment was to be attained. Further improvement and full compliance with the conditions considered essential for an organized fracture service could only be effected by reducing the number of hospitals to which fractures were admitted and concentrating the cases in fracture clinics established in a limited number of selected hospitals. But the hospital service was young and rapidly expanding and developing in many directions and there was severe and increasing pressure upon the bed accommodation which it provided. It was, therefore, clearly inadvisable to embark at once upon a wide-spread scheme of fracture reorganization which would involve, among other results, sudden changes in the burden of admissions falling on each hospital.

The Council accordingly approved, in October, 1936, "a gradual policy of concentrating fractures in selected hospitals" but decided that, in order that experience might be gained, cases of fracture previously admitted to three hospitals should be, in future, concentrated in one of them which should act as the fracture clinic for the group.

Since that time, a departmental committee appointed by the Medical Officer, and consisting of members of the Council's medical staff, have examined the problem in detail and have formulated a provisional scheme for the establishment of fracture clinics in a restricted number of hospitals with a view to a gradual development of the organization in accordance with the decision of the Council.

In March, 1938, the Council instructed the Medical Officer of Health to confer with the London Voluntary Hospitals Committee with a view to a consideration, at a later date, of the organization of fracture services and facilities for the treatment of injuries in the County of London. Discussions are still proceeding.

The Council have now taken a further step towards the development of the treatment of fractures by appointing a full-time surgeon-specialist for the treatment of fractures and other traumatic cases. This officer will be in complete charge of a fracture unit at St. James' Hospital and will devote part of his time to the supervision and direction of other fracture units among the Council's hospitals.

Further development must depend upon the effect of any action taken by the voluntary hospitals with regard to their provision for the treatment of fractures and other injuries. It is understood that the establishment of traumatic units is contemplated in a number of these hospitals. This may well lead to the diversion of a number of admissions from the municipal hospitals to the voluntary hospitals and thus alter the basis upon which the fracture services of the former must be founded. It is, therefore, not yet possible for a final scheme of development in the Council's hospitals to be formulated.

The development of these municipal services may have important consequences for the Voluntary Hospitals, especially the Teaching Hospitals. Already, some of the Teaching Hospitals have had to face a serious falling-off in the number of fracture cases brought to them, and consequent difficulties in arranging for the instruction of their students. These difficulties are likely to become still more acute in the future, unless the Voluntary Hospitals themselves take steps to reorganize their treatment of fractures on modern lines.

The importance and influence of the London Teaching Hospitals in the hospital services of the Metropolis, and the large part which they take in the instruction and training of the future surgeons of the country make it, in our opinion, imperative in the interests not only of the Metropolis but also of the country as a whole, that such a reorganization should take place, and should take place quickly.

We accordingly recommend that the Ministry of Health should take up the matter with the Voluntary Hospitals Committee and the County Council, should invite them to proceed actively with the preparation of a joint scheme, and should offer its assistance.

XI.—SCOTLAND: SOME SPECIAL CONSIDERATIONS.

The Scottish problem is in the main similar to that in England, in so far as the principles underlying efficient treatment are clearly the same in the two countries; but the peculiar circumstances of Scotland raise considerations, largely geographical, that may call for some modification designed to meet Scottish needs.

Scottish hospitals may be roughly classified into three groups:—

(a) those capable of giving a full range of service of the quality contemplated in the Committee's report;

(b) those of cottage hospital type which are not likely ever to function as first line of defence hospitals in any highly developed scheme of fracture treatment, and

(c) an intermediate group including the base hospitals in the Highlands to which reference is made below. They will always have to undertake a fair amount of accident work and are in many cases the only hospitals serving a wide area.

It will not always be possible to get in the hospitals in Group (c) the full range of service contemplated in the Committee's report and it may not be possible to obtain in many of them very substantial alterations in the present methods of treatment, but these hospitals do undoubtedly render very useful service and it may be possible to secure a measure of linkage between some of them and larger hospitals that cannot fail to improve still further their quality of service.

The specific points on which it is desired to focus attention are chiefly three—

(i) the relation of local authority services to the treatment of fractures;

(ii) a recent effort at rehabilitation following industrial accidents in the County of Lanark; and

(iii) the peculiar problem of the Highlands and Islands.

(i) In general local authority hospitals in Scotland do not at present treat any considerable volume of accident cases. Many of these hospitals are not highly equipped and are not at present capable of rendering the quality of service contemplated in the Committee's report either in point of equipment or of personnel. Of the hospitals which are highly equipped some, like Stobhill Hospital, Glasgow, are so situated as to be rather distant from the chief accident-producing areas which they serve, while the few others do not by tradition participate actively in accident work, except that there has been of recent years a growing tendency for voluntary hospitals to seek to transfer long-standing cases to local authority hospitals for continuation of treatment.

Of the 79 voluntary hospitals in Scotland from which returns were received by the Committee some 13 do not treat accidents—several of them have no X-ray apparatus—preferring to pass on accident cases to larger institutions. The incidence of accident cases falls very unevenly on such hospitals as do treat them. Thus during 1935 the Royal Northern Hospital in Inverness with 152 beds treated 121 accident cases as in-patients and Perth Royal Infirmary with 250 beds, 132 cases, whereas Glasgow Royal Infirmary with 794 beds treated 1,195 in-patients, Leith Hospital with 151 beds treated 453 in-patients and the Wemyss Hospital, Buckhaven, with 28 beds treated 120 accident cases. The proportion of cases treated as in-patients to those treated as out-patients varies within wide limits from 0.5:1 to 10:1.

In Glasgow, as in Scotland generally, it has been the practice in the past to leave the care of accidents very largely to the voluntary hospitals; but there are some parts of the country where the existing hospital resources are admittedly overtaxed. Thus the County of Lanark has a combined burgh and landward population of 500,000 and no general hospital within its boundaries of a size much larger than the cottage type envisaged in the Committee's report. Cases of accident from the area are for the most part treated in the large Glasgow voluntary hospitals; but the County is largely an industrial one with many coal mines and steel works and an extensive mileage of first-class roads. It is evident that in Lanarkshire the local authority will probably in time have to provide a considerable part of the accident service, and the question will arise how far it can, or should, be associated with orthopaedic work already undertaken by the County Council.

(ii) *A recent effort at rehabilitation following industrial accidents in the County of Lanark.* The Lanarkshire Orthopaedic Association was set up in the early part of 1935, its first clinic being formally opened on 9th May, 1935, and a second in November of the same year. A record of the work done from 1st May, 1936, to 30th April, 1938, is set out below.

New cases treated during the two years
1st May, 1936, to 30th April, 1938 ... 449

The following is a summary of these cases:—

Discharged from treatment

(a) Fit for full duty ...	114
(b) Fit for light work ...	28
(c) Referred to hospital ...	16
(d) Improved ...	202
	<hr/>
	360
No treatment advised ...	39
Still under treatment ...	147

From 1st May, 1937, to 30th April, 1938, the following treatment, etc., were given:—

Treatments	...	...	...	...	8,037
Visits for Surgeon	...	...	...	...	1,237
					<hr/>
Total attendances	...	...	...	...	9,274
					<hr/>

This scheme raises some points of interest. The clinics are not definitely bound to any existing hospital, nor do patients come direct to the clinics from hospitals. They are in the main patients who have undergone hospital treatment and been returned from it to the care of their doctors who, finding rehabilitation slow, have passed them on to the clinics of the Association. There are no beds available, nor does the surgeon in charge of the clinic always receive accurate records of the previous hospital or other treatment of the cases. Obviously the work of such clinics is carried on under difficulty and it says a great deal for all concerned that much good work has been accomplished.

The maintenance costs of the Association are derived entirely from coal-masters and mine-workers. The Miners' Welfare Fund made a grant towards the initial equipment of the clinic, and the County Council has given premises free of charge as well as undertaking X-ray examinations at a reduced rate. The scheme is of interest in showing (1) that the need for local after-care centres as complementary to the hospital resources of the area has been appreciated, (2) that several agencies, voluntary and official, combine to make the scheme financially possible, and (3) that an independent organization aiming at rehabilitation may grow up in the absence of a general scheme.

The weak spot in such a scheme is lack of continuity in control and treatment. But provided the importance of such continuity is borne in mind there is scope in Scotland for development of the "Outside" orthopaedic clinic idea, which may, indeed, become an essential link in the supervision of accident and orthopaedic cases. Thus in South Eastern Scotland there is already in existence a chain of such out-clinics primarily designed to deal with orthopaedic cases in association with parent hospitals in Edinburgh. These centres, originally intended for the care of children, could be utilized and extended to meet the rehabilitation needs of adults and could form the framework of a unified scheme for each area, avoiding duplication of premises and personnel.

(iii) *The peculiar problem of the Highlands and Islands.* As might be expected, the incidence of accidents in the Highlands and Islands is lower than that in other parts of Scotland, but these areas raise serious difficulties of treatment on account of the long distances involved and the relatively limited hospital

provision available. There are resident surgeons in Inverness, Lewis (Stornoway), Caithness (Thurso and Wick), Orkney (Kirkwall) and Zetland (Lerwick), while recently steps have been taken to provide a further surgical service at Fort William. The surgeons in Orkney, Zetland, Lewis, Caithness and Fort William are subsidised by the Department of Health for Scotland from the Highlands and Islands Medical Service Fund.

Orkney, Zetland, Lewis (Harris) and Caithness present fairly well-defined self-contained problems, each area having its own resident surgeon.

There is an inter-island aeroplane service linking Kirkwall with the other scattered islands of the group, while Zetland has its population conveniently grouped in relation to Lerwick and communication with the hospital there is comparatively easy. The hospital at Stornoway deals effectively with Lewis and the contiguous Harris, while the two hospitals in Caithness which share the resident surgeon can easily cope with the surgical needs of that county.

In Sutherland, where a very good road ambulance service has recently been installed, accident cases mostly gravitate to Golspie. The distances are long but the service is reasonably efficient. In Ross-shire, accident cases find their way partly to Dingwall but mostly to Inverness. Ambulance services in the county are not very good, but if they were brought up to the standard of those in Sutherland the county could be reasonably well served by the existing hospitals. Inverness and the surrounding area raises no special difficulty since it is well served by the Royal Northern Infirmary. The recently appointed surgeon at Fort William will be available for cases from the Lochaber district of Inverness-shire and from the Mallaig area some 50 miles away. The road between these points is very poor but is likely to be rebuilt in the near future. There is in any case a train service between Mallaig and Fort William.

Accidents from the Inverness and Argyll Islands are sent for the most part by air to Glasgow where there is in operation an arrangement for the provision of subsidised air ambulance facilities. Broadly speaking these services are financed on the basis that after recovery has been made from the patients so far as that is possible the deficit is borne two-thirds by the Department of Health for Scotland and one-third by the local authority concerned. Experience has shown that there is little abuse of this arrangement.

A general impression of the sufficiency of resources for accident treatment in the Highlands and Islands is that the hospital accommodation is reasonably adequate, but that the equipment of hospitals is not always all it might be. The real difficulty is one of transport, and the steps that have been taken to secure adequate transport are in the main reasonably satisfactory.

APPENDIX L.

HOSPITAL ACCOMMODATION.

Arrangements between Local Authorities and Voluntary Associations in Scotland.

Section 27 of the Local Government (Scotland) Act, 1927, enables local authorities to provide for the institutional treatment of certain persons under schemes made by the local authorities and approved by the Department of Health for Scotland. Sub-sections (1), (2) and (3) of Section 27 deal with the procedure for the submission and approval of such schemes. Sub-section (4) indicates the methods by which the accommodation may be provided once a scheme is approved. These include (1) contracting for the use of a hospital and (2) entering into an agreement with the person managing a hospital, or part thereof, on payment of such annual or other sum as may be agreed on. Both these methods would enable the local authority to arrange for the accommodation of local authority cases in a voluntary hospital, and it would also appear that there is a wide discretion as to the financial arrangements which might be agreed for this purpose.

Only four local authorities in Scotland, however, have made schemes under Section 27, viz., the Town Councils of Edinburgh, Dundee and Aberdeen and the County Council of Bute.

Scottish local authorities have similar powers under Section 66 (1) of the Public Health (Scotland) Act, 1897, for securing the use of hospitals by contract or agreement for the accommodation of cases of *infectious disease*.

Under the Poor Law Act of 1845 Scottish local authorities provide for the hospital treatment of the sick poor. Section 67 of this Act enables the authorities "to contribute annually, or otherwise, such sums of money as to them may seem reasonable and expedient, from the funds raised for the relief of the poor, to any public infirmary, dispensary or lying-in hospital, or any lunatic asylum, or asylum for the blind or deaf and dumb." The expression "public infirmary" can probably be taken as covering most types of voluntary hospital. In practice many local authorities contribute to voluntary hospitals in respect of the care of the sick poor by means of annual subscriptions, but in some cases payment is made on a case basis for individual patients.

Under the Notification of Births Acts, local authorities have wide powers in respect of the care of expectant and nursing mothers and children under five. These powers are regarded as sufficient to cover any necessary institutional treatment whether in a voluntary hospital or otherwise, and there are no restrictions as to the manner of payment.

Section 3 of the Education (Scotland) Act, 1913, gives Education Authorities a power to provide treatment in necessitous cases to school children found on medical examination to have "defects." Under this power the authorities may send suitable cases to voluntary hospitals by arrangement.

Reference may also be made to Section 16 of the Local Government (Scotland) Act, 1929, which enables local authorities to make payments, with the approval of the Secretary of State, "for the purpose of any scheme of public utility." Some Scottish local authorities have made contributions to voluntary hospitals under this power.

APPENDIX M.

APPROVED SOCIETIES (SCOTLAND).

Subject to the modifications set forth below, the position in Scotland is, broadly, the same as that summarised for England and Wales in Appendix K.

(1) The sum set aside for the purpose of hospital benefit in Scotland in the year 1938 was £12,000 (as against £92,500 in England and Wales).

(2) The figure for "Donations and Subscriptions" made to hospitals by Approved Societies in Scotland amounted in 1938 to about £4,500 (as against £20,000 in England and Wales).

(3) As regards Additional Benefit No. 16, this has been operated in Scotland on less restricted lines, approval having been given to proposals submitted by Approved Societies to make payments to a considerable number of institutions, including not only clinics but also voluntary hospitals, providing special forms of treatment for different patients, such special treatment including massage, X-ray, orthopaedic and electrical treatment.

The sum set aside for the purpose of this benefit by Approved Societies in Scotland in 1938 was about £1,000 (as against £34,000 in England and Wales).

XII.—OTHER INJURIES BY ACCIDENT.

We have in a previous chapter (IV) explained why we have not submitted proposals for the institution at this stage of traumatic clinics for the treatment of accidents in general: and, in doing so, have referred to some of the evidence which was given to us in regard to the treatment of classes of accident other than fractures.

We have no evidence to show that it is necessary to apply in full to a large proportion of the miscellaneous, and mostly minor, injuries which fall within this group (see classified list on page 23), the three principles of segregation, unity of control, and continuity of treatment, but we do not wish to appear to underrate, from the point of view of our inquiry, i.e., of the restoration of working capacity, the importance of many of these cases. Some, at any rate, of the aspects of the problem of restoring working capacity in fracture cases, with which we have dealt in this report, are common to serious injuries by accident generally. For instance, from the injured man's point of view, it makes no difference, as regards his anxiety about the provision for his family or the chances of getting back his old job, whether he is laid off by a fracture or by serious burns. Many of the cases in this group, we are advised, may—if not properly treated—lead to more prolonged disablement than many fractures.

We have little doubt that the principles of continuity of treatment and after-care until working capacity has been restored, should be applied in the accident departments of hospitals to the treatment of all injuries entailing disablement. We have given the reasons why, on strictly practical grounds, we are not prepared to propose the establishment, at one step, of fully-organised services for the injured. We believe, however, that the results of organised fracture treatment will lead to the adoption of similar measures for dealing with other disabling injuries. We note the general tendency to appoint as Casualty Officers men with special qualifications and experience; and are informed that some important hospitals have taken the further step of placing the general casualty service under an honorary member of the staff. Development along these lines should lead to the recognition of the need for rehabilitating persons suffering from miscellaneous injuries by organised services analogous to those which we recommend for fractures. Further experience may indicate that a rehabilitation scheme for patients suffering from miscellaneous accidents should have special features appropriate for certain classes of injury.

Sir John Fraser touched on this in the evidence which we have quoted in Chapter IV. His view was that "in association with the Fracture Clinic there would require to be a considerable establishment for after treatment designed particularly

towards rehabilitation, and in this respect the other results of trauma would be included in that section."

In the chapter of our Report which deals with the "reconditioning" stage subsequent to the hospital treatment, we have remarked that the principles indicated there will apply to other kinds of serious injury.

While, therefore, we do not make any recommendation for the enlargement of the Fracture Service into a general Traumatic Service—which should come about, if at all, as a process of natural development—we feel strongly that the question of rehabilitation, i.e., the restoration of the injured man whose case falls within this miscellaneous group to his full working capacity for his old job, should receive much more attention than it often, or usually, has in the past. The Department dealing with the case should not lose control of it until restoration, so far as that is possible, has been effected. After-care must be exercised here as in the case of fractures. In planning departments for the physio-therapy and remedial exercises in the fracture clinic account should also be taken of the requirements of these other cases.

We, therefore, recommend that in every hospital which treats accident cases:—

- (1) the work should be so organised that, in all cases where working capacity is in danger of being impaired, control should be exercised and treatment continued until restoration is effected;
- (2) the service should be organised and, where necessary, developed so as to make provision for the application of remedial exercises, etc., under supervision, in such cases.

XIII FIRST AID AND AMBULANCE.

The rendering of First Aid and Ambulance service in the case of serious accidents is a very important preliminary to the treatment in hospital and on the quality of the service may often depend the issue of the case.

We have not thought it necessary—nor did we understand that we were asked—to review the general arrangements for the provision of these services. Evidence in regard to certain matters affecting them was tendered by some of the witnesses, and we shall refer presently to the points which they raised; but on the general methods of organising the services no question was raised.

The importance of these services is now almost universally recognised, and there is little or no difference of opinion, so far as we are aware, on principles. Great strides have been made since the beginning of the century. Provision for First Aid is now made obligatory by statute or statutory order at every factory, mine, dock, building operation, and work of engineering construction. Every police officer in the Metropolitan Police Force is required to be in possession of a certificate of efficiency in first aid and the same is the case in the great majority of the provincial police forces. Persons trained by the several Ambulance Associations in First Aid played an important part in the Great War. The number of persons in the country who have voluntarily gone through this training is said to be immense. Instances could be multiplied of the ways in which they render service to the community. Perhaps one of the most important at the present time is in connection with Road Traffic accidents; the men employed on the roads by the motoring associations, though not required to do so, are encouraged to qualify and a very large proportion, we are informed, do.

The scope of "First Aid" is defined in the text-book of the St. John Ambulance Association as follows:—

"The science of First Aid to the Injured is based on fundamental principles of practical medicine and surgery, a knowledge of which, in cases of accident and sudden illness, enables trained persons to render such skilled assistance as will preserve life, promote recovery or prevent aggravation of the injury or condition until the arrival of the doctor or during transport."

The text-book "deals primarily with First Aid rendered by an individual at the scene of the accident with such materials as may be at hand, as distinct from 'organised' First Aid as practised by First Aid Units trained to work together and equipped with suitable appliances".

The development of the "ambulance" service, both in quality and extent, is equally remarkable. It is a far cry from the two-wheeled hand ambulance of the "nineties" to the motor ambulances, with their trained attendants, which are to be seen to-day on the roads in most parts of the country—provided, it may be, by the local authority, by the police, by hospitals, by large firms for the use of their employees, by voluntary organisations.

It is worth remembering that much of this progress is of quite recent date. While much was no doubt being done individually and voluntarily before, it was not till 1916 that power was first given by an Act of that year to require provision for First Aid in particular classes of factories; and not till 1923 that the requirement was made, by the Workmen's Compensation Act of that year, to apply to all factories. It has now been further extended and developed by the Factory Act of 1937. In the case of mines, the first provision on the subject was contained in the Coal Mines Act of 1911.

As regards the general organisation of these services we have no recommendations or suggestions to make. We believe that they can be extended and developed without difficulty where and so far as may be necessary for the effective working of Fracture Service schemes such as we have suggested.

There are certain points in connection with the services to which our attention was called by witnesses of experience.

The representatives of the Association of Industrial Medical Officers stressed the importance of improving the quality of the "First Aid" treatment given at the "works". The ideal was that all injuries should be attended to at once by a doctor or trained nurse. Experience has shown that where first aid is given from a first aid box or cabinet in the work-rooms, the sepsis rate is far higher than when it is given in an ambulance room. Short of this ideal, it would, in their opinion, be of great value if all industrial first aid arrangements could be regularly supervised by the "examining surgeons" under the Factory Act or by a local doctor. We observe that a similar recommendation is made in the recently issued Report of the Royal Commission on Safety in Coal Mines, as follows:—

We recommend, therefore, that the owner of every mine should be required to appoint a qualified doctor to exercise general supervision over the colliery first-aid arrangements, and to advise the owner in relation thereto. The doctor appointed would, if not employed on full time basis, be expected to visit the mine at appropriate intervals having regard to its size and other circumstances, and at these visits he could perform a most useful service by going over the treatment records with the person in charge of the first-aid room, by discussing points of difficulty with

him and by advising and instructing him generally. If arrangements could be made for the same doctor to attend to all cases of injury requiring medical attention before the injured man is sent away from the mine that would be an excellent thing, though it could hardly be made a statutory provision.

This appears to us to be a most valuable proposal which could be extended with advantage to other industries.

The same Report contains two other proposals which we think could be adopted with great advantage in other industries. One relates to the initial qualifications of persons placed in charge of ambulance rooms in the larger undertakings:—

At mines where a separate first-aid room is required, we think that the person in charge (if not a qualified nurse or a doctor) ought to have some training over and above that necessary to obtain a first-aid certificate from one of the approved bodies. Except that he must be "competent" the present regulation calls for no higher qualifications than those required of the first-aid men among the persons employed below ground. We think that the attendant at the first-aid room on the surface should be required, in addition, to have received some form of special training on approved lines, which could best be given at a hospital.

The other relates to the maintenance of the efficiency of the men detailed to render first aid:—

With regard to the qualifications of first-aid men generally, we note that under the existing law both the person appointed in charge of a first-aid room and the first-aid men under ground are required to hold "a certificate of proficiency in first aid from a Society or Body approved by the Board of Trade", but that there is no provision to ensure that such person shall maintain his proficiency. We think that this is a defect, since no one can be expected to retain all the knowledge gained in a first-aid course and to maintain full efficiency indefinitely without an occasional refresher course. We recommend, therefore, that every first-aid man should be required to re-qualify three years after gaining his original certificate of proficiency, and thereafter at intervals of five years.

At the works of one large Company which we visited (the London Brick Company) we were informed that all the First Aid men are members of a St. John Ambulance Brigade, and as such are required to re-qualify every year. This will no doubt also be the case at other large concerns.

The importance of refresher courses was also urged by the witnesses from the Industrial Medical Officers Association.

The same Association's witnesses emphasised the great importance of the early treatment of "shock" in serious cases. Patients are often moved too soon. Adequate first treatment will also prevent the occurrence of "secondary shock". One of them, Dr. Stewart, said:—"My contention is that a serious accident should never be transferred to hospital (I am speaking now from experience in the factory) until he has recovered from shock. One of the most important things that an industrial medical service can do is to eliminate the shock that occurs and which, in my opinion, has caused so many fatal accidents. Even in the smallest factory you can eliminate shock altogether by simple methods. . . . Provided the patient is breathing properly and not bleeding to death, I believe if we get a man into a warm comfortable foreman's office or a part of the factory where he can be kept warm and cover him with blankets, shock will not occur. . . . That is the main thing—keep him warm and keep him at rest." The First Aid Book of the St. John Ambulance Association lays emphasis on the same thing, but there is reason to believe that it is often overlooked.

Another point that was emphasised by those witnesses was that a serious case should not be sent to the hospital until it can be seen by a doctor and the doctor can say whether he is fit to go.

Several witnesses have urged the advantages of the Thomas splint and the desirability of training first-aiders in its use. We are advised that the advantages of the Thomas splint for first aid in civil life are not even yet sufficiently appreciated. We recognise that there are certain difficulties attending its wider use. It can only—we understand—be applied effectively by two or even three people and not by a single individual. For instance, it is for this reason that it is not deemed suitable for the practical first aid which has to be given by an individual police officer, and that the ambulances of the London County Council do not carry the Thomas splint. Its extended use has also been advocated for underground work in mines, but Dr. Fisher, H.M. Medical Inspector of Mines, tells us that for use in mines the long wooden splint is better than the Thomas splint because (1) all first aid men are taught to apply it, (2) if properly applied, it immobilises the broken fragments, (3) Thomas splints would have to be provided in several sizes to suit both boys and men. Nevertheless, we suggest that instruction in the use of the Thomas splint and its provision at First Aid stations should be given more consideration. We observe that the latest edition of the text-book on first aid issued by the St. John Ambulance Association incorporates a chapter on the Thomas splint.

As regards the ambulance transport service, our attention has been called to the comments made in the Report of the

Voluntary Hospitals Commission, issued in April, 1937, to which we have alluded in an earlier chapter. The Report says that:—

“ The Commission are of opinion from the evidence placed before them and from their general knowledge that there is great diversity of arrangement and considerable variation of charges in the provision of ambulance service. They also consider that the present service is inadequate in many areas.

And they recommended that a responsibility should be placed on the local authorities to organise, with the co-operation of all voluntary agencies, an adequate service on a regional basis.

The provision of ambulance services in this country has grown up piecemeal and without any general effort towards co-ordination. Ambulance provision for accident cases has been made by the British Red Cross Society, the St. John Ambulance Brigade, and St. Andrew's Ambulance Association, by Contributory Schemes in certain places, and by the police, as well as by a number of local authorities acting under the powers first given by the Public Health Acts Amendment Act of 1907. It has inevitably resulted that in some areas provision has been insufficient; in others, perhaps more than adequate; and that there has been a lack of co-operation between the different services.

Powers to provide ambulances for general public health services are now conferred on County Councils as well as on other local authorities by Section 197 of the Public Health Act, 1936.

These powers are permissive; no obligation is placed on the local authorities to provide such services.

We understand that the Ministry approves the proposal of the Voluntary Hospitals Commission that the ambulance services should be organised on a regional basis. This will fit in with the recommendation we have made that Fracture Services should be organised regionally by the local authorities, i.e. the County and County Borough Councils, and the voluntary hospitals in consultation, and that the Councils should be invited by the Government to take the initiative in the matter. We suggest the invitation should cover also the question of the organisation of the ambulance services in the area. Obviously, in preparing schemes for fracture services, account will have to be taken of the adequacy or otherwise of the ambulance services in the area and measures taken to supply deficiencies or fill up gaps. Whether a definite responsibility, with the necessary powers, should be placed on the County and County Borough Councils to co-ordinate the different services is a question on which we are not able to express an opinion. The Ministry of Health has emphasised to us the importance of co-operation between

the services, particularly in respect of the County areas, and without some statutory requirement in regard to co-ordination, it may be difficult to secure this.

It is only a few years since the Ministry found it necessary to issue a circular letter to local authorities (2 November 1933) urging the adoption of arrangements for co-ordination and co-operation between ambulance services. Cases were not unknown where a local authority's ambulance was not allowed to go outside the district and patients had to be transferred to another ambulance at the boundary. We understand that things are a good deal better now but it seems to us that if the treatment of injuries by accident is to be placed on a satisfactory footing, a review by the local authorities, under the guidance of the Ministry, of the present arrangements is indispensable.

For an instance of a scheme of co-ordination which has been worked out by a County Council in conjunction with the local organisations, we may refer to the Annual Reports of the Medical Officer of Health of Cumberland for 1935 and 1937.

The important point of standardisation in the design of ambulances and ambulance equipment was raised in evidence. One of the witnesses who appeared on behalf of the Association of Industrial Medical Officers said:—"There are 152 manufacturers of stretchers, stretcher gear for ambulances, and hospital trolleys. There is no standardisation at all so that a man may be put on a stretcher and when he gets to the ambulance . . . the door will not shut. The patient has to come off the stretcher and be put on a telescopic-handled stretcher. He goes in the ambulance to the hospital. They take out the stretcher and . . . he should then be taken on the trolley and pushed into the Casualty Department. Not a bit of it. The stretcher will not fit the trolley . . . He has to be transferred on to the hospital stretcher and is taken in. He may eventually go to the ward that way, all right, but he has been moved three or four times whereas if he had gone into a standard stretcher he need never have been moved at all."

We observe that the same point is taken in the Report of the Royal Commission on Safety in Coal Mines, who say:—

"As a further measure to minimize the effects of shock and to avoid the risk of aggravating a patient's condition in other ways during his removal to his home or to hospital, we would advocate the standardization of stretchers and of the corresponding fittings in ambulance vehicles. After an injured person has been placed on a stretcher for transport in or at the mine, it should never be necessary to transfer him to another stretcher for conveyance to hospital, although we understand that this may, and does, happen at present."

We are glad to know that the British Medical Association are giving attention to the question and considering what should be done, but it seems to us that if they are unable to secure rapid improvement, the matter is one in which the Government should take the initiative.

The question of First Aid and Ambulance services for the civilian population is apt to be thought of as a purely "home" matter, but an interesting account which has been received by the Committee of the Rehabilitation work carried on by the Steam Fishers Provident Society at Aberdeen for the benefit of men employed on fishing vessels has directed our attention to another aspect of it—the question of First Aid treatment in the fishing industry of the country. The following figures are significant. During the year 1936, among a membership of 2,981, 1,217 cases of injury occurred. Of these 688 or 56·5 per cent. were septic wounds, 259 or 21·2 per cent. were minor injuries (cuts, bruises, lacerated wounds, crushing, sprains, eye injuries, etc.), 64 or 5·3 per cent. were fractures, 23 or 1·9 per cent. were hernias. The majority of the members would be employed on trips averaging about four days at sea, but a considerable proportion, between a quarter and a third, would work on trips to the Faroe or Icelandic waters averaging 13 and 17 days respectively. In all cases of serious injury the boat makes for the nearest port in Iceland, Faroe or Great Britain, but the treatment of minor injuries leaves much to be desired. The high proportion of septic cases (mainly hands and fingers) is sufficient evidence of this.

We have brought the matter to the attention of the Mercantile Marine Department of the Board of Trade and the Committee has been informed that the supervision has recently been strengthened and that the inspection of the medicine chests and first aid equipment in the steam trawlers at the port is now very much more thorough and frequent than was formerly possible. As a result of this action the position is now very much improved.

XIV.—SUPPLY AND MAINTENANCE OF ARTIFICIAL LIMBS AND OTHER APPLIANCES TO DISABLED PERSONS.

We have so far considered only the measures that can be taken for the restoration of an injured person's natural physical capacities by surgical and other remedial methods; but our terms of reference go further. They cover all arrangements "with a view to the restoration of the *working capacity* of persons injured by accidents"; and, in the case of those who are left with some permanent impairment of their physical capacities, as, for example, by the loss of a limb, we have not lost sight of the possibility of making good the impairment by the use of surgical appliances or other artificial aids. The design of such appliances or aids has in recent years, largely as a result of the war, been carried to a high degree of perfection, and in many cases an injured person regains such a measure of working capacity as to enable him to earn his living without serious difficulty or inconvenience, very often in his old occupation or, if not, in some other occupation to which he can turn his hand or for which he can be trained.

The Committee have had the opportunity of seeing the work done at Queen Mary's Hospital, Roehampton, in the construction and fitting of artificial limbs, and the remarkable results obtained with ex-service men who are themselves employed in the work of making the limbs. We are informed that the experience gained in dealing with the large number of war cases has led to considerable improvements in the structure and mechanism of artificial limbs and, at the same time, to very large reductions in the cost of the limbs supplied. Further, it has been established that the surgical oversight and technical control of the supply and fitting of an artificial limb are essential to the effective equipment of amputation cases.

There will, we are sure, be general agreement that the supply of artificial limbs and other aids to persons injured in civilian pursuits should be placed on a not less satisfactory footing than the supply to those wounded in the war; and we are glad to be able to record that, on the initiative of the Committee of Queen Mary's Hospital and of the Ministry of Pensions, arrangements have been sanctioned by the Treasury for making available to the civilian population the "special knowledge, expertness and organisation" possessed by the Ministry.

It is in this respect, perhaps, rather than in respect of the facilities for obtaining artificial limbs and appliances that the arrangements hitherto have been seriously defective.

The announcement of the arrangements just mentioned which was published in the Press (July 28th, 1936) contains the following passage: "The replies received from eminent surgeons who were approached" (i.e., as to the propriety of

the Ministry giving this kind of assistance) "made it abundantly clear that they recognized the deficiencies of existing practice in regard to limb fitting and very heartily welcomed the possibility of patients obtaining expert surgical advice as to the adjustment of their artificial limbs". 'It is unfortunate', as one of them wrote, 'that the present civil practice seems to be for the surgeon who amputates limbs to refer the limbless individual to the limb-maker for the fitting of artificial limbs. The limb is then fitted, without any supervision or guidance, and the result is often a failure . . .'. Or again, as another wrote, 'With few exceptions, the surgeon takes very little part in the supply and fitting of artificial limbs and the unfortunate sufferer is left to his own devices. It would be a great and beneficial service to the community if the help of the Roehampton Committee's Scheme could be extended to the provinces'.

We have no means of ascertaining whether the assistance thus offered by the Ministry is widely known, but it would seem that, outside London, advantage is not being taken of it to any great extent. The Ministry has, in the Provinces, 11 limb fitting centres at the following places, Birmingham, Bristol, Cambridge, Cardiff, Exeter, Leeds, Liverpool, Manchester, Newcastle, Nottingham, Portsmouth, and in Scotland three, at Edinburgh, Glasgow and Aberdeen. We are informed that during the period from 1st April, 1937, to 31st March, 1938, applications were made in 308 cases in respect of the supply of new limbs, and of these 193 came to Roehampton. Ninety-three of the cases came under arrangements with the Railway Companies, 137 from Local Authorities, and 78 were private applications. The volume of work done remains, we are told, about the same from year to year. In addition, applications were made in about an equal number of cases for the repair of artificial limbs. It seems regrettable that much greater advantage is not taken of the limb-fitting services of the Ministry. At Newcastle, for example, only seven new applications were made in the year referred to, at Cardiff four, at Exeter three. No doubt the methods and technique which the Ministry has developed are becoming known to and practised by others. Lectures and demonstrations on amputated stumps and on the technicalities and actual fitting of artificial limbs have been given by the Ministry's representatives. But, evidently, there is a wide field, at present untouched, for the use of the services which the Ministry can render.

We note that the service is operated in connection with the arrangements of the Roehampton Hospital Committee* for the supply of artificial limbs, and is not available at present in connection with the supply of such limbs by private makers.

* As to these arrangements see Appendix.

It appears to us that it would be a national loss if the expert service which has been built up by the Ministry of Pensions, should be allowed gradually to disappear as the number of war pensioners requiring these appliances diminishes. We are not in a position to make any recommendation as to the arrangements which might be made for keeping the service in existence and making it a general public service, but we would recommend strongly that the possibility of doing so should be considered as a matter of national interest.

We have made some inquiries as to the sources from which the cost of artificial limbs and other appliances can be met in the case of persons of insufficient means to provide them for themselves.

Such appliances cover a fairly wide range. Some are required for temporary use only. No special difficulties, we understand, arise with regard to these. Hospitals usually provide from stock the simpler and less expensive appliances, such as temporary crutches, the patient paying the cost price, or part of it, if he can afford to do so or if he cannot, being supplied with the appliance free.

The case is different when the more expensive appliances for permanent use are required. An artificial leg costs a considerable sum to start with, will cost perhaps something each year to keep it in proper repair, and, if subjected to active use, will need renewing at intervals of some years. The cost, if the patient is unable to bear the whole charge himself, may be met by assistance from various sources to supplement what the patient may be able to pay himself, if anything. In fact, a considerable proportion of the cost of special appliances is, we are informed, borne by the patients themselves. The sources from which assistance may be obtained are the following:—

(a) *Approved Societies* under the National Health Insurance Acts may supply or contribute to the cost of surgical appliances, artificial limbs, etc., under Additional Benefit No. 13 (Medical and Surgical Appliances) where surplus funds are found to be available on a valuation and where the particular society concerned has adopted this benefit.

(b) *Employers and insurance*.—Inquiries made of organisations representing a variety of industrial interests have elicited information as to the practice of many employers. It is stated that whenever a definite medical opinion is given that the provision of a surgical appliance will hasten recovery, and if this is shared by the employers' own medical adviser, steps are taken to ensure that this is obtained at no cost to the workman. Frequently the cost is shared on a fifty-fifty basis, either by the employer, or by his Mutual Indemnity Association, and the workman's Approved Society, if the latter has funds

available for this purpose. If the Approved Society is unable, or refuses, to be a party, employers, in general, meet the whole of the cost. It is exceptional for a workman, injured in industry, to be called upon to bear the cost of an artificial limb, or a surgical appliance.

(c) *Hospital Contributory Associations*.—Assistance may be available under contributory schemes. We were informed by the Hon. Secretary of the British Hospitals Contributory Schemes Association that the practice varies. "Some provide appliances, some provide assistance towards the purchase of them, others make no provision at all. We in Birmingham provide assistance if a contributor makes application to us; we investigate the case and find how much he can pay, if anything, and if his Approved Society will make a grant; there are other societies in the City operating for that purpose, and we see what they can do to see that the man gets the 'limb' or other appliance."

(d) *Charitable Societies*.—The Royal Surgical Aid Society is the chief national society specialising in this field, but most cities and large towns have local Cripples' Aid Societies which provide part cost of appliances in approved cases. Many hospitals have a Samaritan Fund which may help.

(e) *Local Authorities*.—Local Authorities acting under public health powers, may provide limbs and other appliances when such provision properly forms part of the treatment given in their hospitals.

(f) *Public Assistance Authorities* may supply artificial limbs as part of medical relief under the Poor Law Act to persons who need them and have not the means of providing them. It is not necessary for the applicant to show that he is destitute in the general sense of the term, but merely that his means are insufficient to enable him to pay for the required appliance. Strictly speaking, it must be shown that the appliance is required on medical grounds. The various authorities exercise their discretion in different ways, but generally speaking they do not put too strict an interpretation on "medical grounds" and entertain applications in cases where the appliance is required to give the patient a reasonable chance in competing for work in the labour market.

In principle, therefore, where other agencies fail, the Public Assistance service can be applied to in the last resort by accident victims whose resources are insufficient for the purpose.

So far as the question of cost is concerned, we do not find it necessary to offer any recommendation. It has not come out in the evidence we have received that, in any considerable number of cases, permanently disabled persons are unable,

through lack of means or of assistance from public or other sources, to obtain the appliances they require. It is true that it is not only the cost of the initial supply that has to be met. The maintenance of the appliance in an efficient state, it may be over a period of many years, is equally important. It has been represented to us that the cost of this may be a heavy burden for a poor man. This appears to us, however, to be a matter for assistance by the same agencies as the original supply. Approved Societies may contribute to the cost of repair or renewal, as an additional benefit; public assistance and other bodies are no doubt prepared to do the same. We would emphasize here, too, the value of the services which can be rendered, in regard to repairs, by the limb-fitting centres of the Ministry of Pensions.

We have not thought it necessary to give consideration to the question where the liability for the supply and maintenance of appliances in cases coming under the Workmen's Compensation Acts should fall, as that, like other questions affecting the restoration of an injured employee's working capacity, will no doubt come under the consideration of the recently appointed Royal Commission.

We are not satisfied, however, that adequate machinery always exists for advising and assisting a patient in the matter. Where an adequately staffed and efficient Almoner's Department exists in the hospital, a patient for whom the surgeon recommends the provision of an artificial limb or other special appliance, is referred as a matter of routine to the Hospital Almoner. The Almoner who knows the patient's means and has special knowledge of the sources from which they may be supplemented, will take up the matter on the patient's behalf, and communicate with any Approved Society, employer or insurance society, contributory scheme, or other agency concerned; failing these, or in addition to these, recourse may be had to charitable societies, such as the Royal Surgical Aid Society. The Charity Organisation Society frequently assists by undertaking inquiry and home case-work on behalf of Almoners.

Where there is no adequate Almoner's service—and that is the case at many hospitals—the patient may be left to take such steps as best he can.

We are strongly of opinion that an Almoner's services should be available in all such cases as a matter of hospital routine, and would refer to the recommendation we make in a later Chapter on "The Almoner's Department".

APPENDIX N.

MINISTRY OF PENSIONS ARRANGEMENTS FOR SUPPLY OF ARTIFICIAL LIMBS.

As a result of the Great War the Ministry of Pensions has had to supply and keep in repair artificial limbs for about 42,000 war pensioners. The Ministry was naturally concerned to ensure that the best types of limbs should be supplied at reasonable prices and appointed Advisory Committees, composed mainly of Surgeons and Engineers, to consider and advise on the question. As a result of their labours the Ministry has built up a very efficient service for the supply of artificial limbs.

The limbs are fitted under the supervision of the Ministry's expert Limb-Fitting Surgeons who have gained extensive knowledge of this subject.

Artificial limbs are manufactured for the Ministry by a firm of contractors who have a long term contract for this work, who employ about 400 skilled craftsmen and have the largest organisation in this country, devoted solely to the construction of artificial limbs.

A large and modern factory has just been completed for this work at Roehampton. The contractors use this factory and have installed precision machines to make the component parts of limbs. These contractors have branch workshops and fitting rooms at each of the provincial limb-fitting centres where their work is supervised as at Roehampton by the Ministry's Surgeons and Technical Inspectors.

As far as civilian cases are concerned, the only service which the Ministry has undertaken to render is that of the Surgeons in connection with the prescribing, fitting, adjustment and repair of artificial limbs and for this a moderate fee is charged. The Roehampton Hospital Committee make all other arrangements with the contractors for the supply of limbs and the Secretary will be pleased to give full information including the price of a limb considered by the Surgeon suitable for a particular case.

All communications on this subject should be addressed to the Secretary, Queen Mary's (Roehampton) Hospital Committee, Roehampton, S.W.15.

XV. VOCATIONAL TRAINING.

In earlier Chapters of this Report we have endeavoured to suggest a complete scheme of treatment for those cases of fracture which can be restored to their pre-accident condition to such an extent that the victim is able to return to his previous occupation. We recognise, however, that there will be cases where, by reason of the fact that the victim is left with some degree of permanent disablement, resumption of the previous occupation will be impossible. In many cases the disabled person is able to find some other occupation of a kind suitable to his disability, and it is fair to say that in such cases working capacity has been restored, even though it has not been possible to resume the original employment. In other cases working capacity can only be restored if it is found possible to provide efficient training which will enable the victim to follow a fresh occupation in which his residual disablement will not prejudice his success. We now have to consider how far it is likely to be possible to provide training for cases of this kind and also the channels through which it could reasonably be provided.

We have no means of estimating either the number of cases which occur at present, or the number (which we anticipate will be much reduced as a result of the improved methods of treatment in a properly organised system of Fracture Clinics) which are likely to occur in the future. So far as fracture cases are concerned, we suggest that the number of cases in the course of the year which would be suitable for vocational training might possibly be in the region of one to two thousand; but the number can only be ascertained by experience. To this figure must be added an uncertain number of persons disabled as the result of other kinds of injury by accident. The fact that we have heard so little of any major problem existing at the present time indicates perhaps that the problem is not a big one.

The largest body of experience in this country in connection with the training of disabled men is that which was obtained by the Ministry of Labour after the Great War when it became necessary to re-equip a great body of disabled ex-Service men for entry or re-entry into industry, and over 100,000 men were trained in a great variety of trades and occupations. The experience of the Ministry of Labour was that, though certain disabilities naturally precluded training for certain trades, the man's previous occupation, his age, and the personal factors arising out of his general make-up, education, and environment were of even more importance than the nature of his disablement as factors governing his suitability for training for a new occupation.

It was, of course, necessary to restrict the training to trades and occupations in which there was likely to be a reasonable prospect of employment for the numbers of men accepted. A large measure of success was achieved in the placing of trainees in industry; but it must not be overlooked in this connection that this success was largely due to the universal public sympathy evoked by the men who returned disabled from the world war, and to the readiness of employers to give a man a chance to acquire speed and to gain experience, under the actual conditions of employment, after they had completed the institutional part of their training. It is to be feared that there may not be the same readiness to employ trainees whose disablement precludes a return to their previous occupations. Nevertheless it is to be noted that institutions like the Cripples Training College, Leatherhead Court, and other similar institutions have met with considerable success in placing in employment the persons they have trained.

As it appeared that under certain conditions Local Education Authorities are entitled in respect of persons sent by them to be trained at certain institutions to a grant of half the cost from the Board of Education, we deemed it desirable in the first place to enquire how far it might be possible for vocational training for the cases under discussion to be provided by Local Education Authorities as a matter of education. We accordingly invited representatives of the Board of Education to discuss the matter with us, and we gathered that the position is broadly that the Local Education Authorities have the statutory *duty* to provide elementary education, including the provision of special facilities for defective children; and they further have *power* to provide other educational facilities of various kinds. The vocational training for a new trade of persons who have been so severely injured that they are unable to return to their former occupations *could* be regarded as a form of education falling within the province of the Board of Education and of Local Education Authorities. The Board already recognise for grant residential vocational courses at Cripples Training Colleges for about 500 cripples, but nearly all of these are adolescents who have been crippled by disease. They also recognise courses for the vocational training of the blind, many of whom are older persons who have become blind after reaching adult age.

While, however, this work *could* in theory be undertaken by the Local Education Authorities it is very doubtful whether in practice this would prove possible. The vocational training of adults crippled by accidents is so remote from the normal range of education administered by Local Education Authorities that they would probably regard it as outside their province.

A few Authorities might be willing to make provision, but it is improbable that any comprehensive scheme would be practicable. The fact that some Authorities provide vocational training for persons who have become blind as adults is not conclusive as the number of such cases is small and blindness commands more popular sympathy than other defects.

And finally, if the Committee is right in supposing that the number of persons so disabled as to require vocational training in another occupation might possibly be in the region of one to two thousand a year, the existing vocational courses for cripples would be unable to take more than a small fraction of these cases. Further as they are designed primarily for adolescents it is unlikely that the Managers would be willing to accept older persons even if it were thought desirable that they should do so.

Again, it would not be practicable to provide such training in day Technical Schools (where such have been established), whose functions do not normally extend to strictly vocational training of the kind contemplated. They are intended to provide a ground work for the young adolescent who intends to enter a particular industry or trade or to supplement the practical experience gained in the workshop by persons already in employment, and while a Local Education Authority might occasionally admit to such a school a *young man* who had been partially incapacitated by accident, they certainly would not find it possible to admit disabled men generally irrespective of their age and other circumstances.

It seems clear, therefore, that although a few cases falling within narrow age limits may continue to be provided with vocational training by the Local Education Authorities, as a matter of education, at such places as Cripples' Training Colleges and Technical Schools, the number of cases likely to be provided for in this manner will not represent more than a fraction of all the cases requiring training. It follows, therefore, that if a scheme of training for the cases under consideration is to be provided, it must be by the establishment of special training centres for the purpose. It would be impracticable to provide these in each Local Education Authority's area, as the numbers of cases in any one area would not provide sufficient scope for variety in the trades taught unless the overhead expenses were out of all proportion.

The centres must therefore be provided by some central Department. We are of opinion, and we understand the Board of Education to concur, that the Ministry of Labour, in view of its earlier experience in training the war-disabled, and more recently the younger unemployed, and further because they are in the best position to judge what openings there are in any district for which a partially disabled man could be trained with a prospect of getting employment, is the most appropriate Department to undertake the work. The type of training at

present given in the Government Training Centres for fit unemployed men which, generally speaking is specialised and restricted to a few major trades, such as engineering and building (as we have seen at the Watford Training Centre, for example), would not as a rule meet the new circumstances. A Centre or Centres of a new type would have to be arranged, catering specially for the disabled men and giving training in kinds of trades different from most of those taught in the Training Centres for fit men.

The numbers of cases in which training could usefully be given would not, so far as can be seen, be sufficient to justify more than one or two Centres at which the necessary staff and equipment could be provided for giving instruction in a sufficient variety of trades and occupations, manual and other. Trainees living in the neighbourhood of the Centre could attend as day students whilst living at home. For others either hostel or lodging accommodation would have to be provided, and only those who were prepared to leave home for a time could take advantage of them. This could not be avoided.

The Ministry state that, so far as technical considerations go, there is a considerable scope for training disabled men for suitable employment or for work on their own account. This scope is however much restricted by the fact that, even where it is possible to teach a disabled person a new trade which he will be physically able to perform, it is not possible to expect that employers in the principal industrial occupations, such as engineering or building, would be willing to employ them. The effective scope lies therefore mainly in the lighter industries and occupations, such as light engineering processes, tailoring, boot and shoe repairing, watchmaking, clerical work, basket making, the retail shop trade, etc. It must be a fundamental principle of any scheme that the numbers of disabled men taken for vocational training should be very strictly limited by the prospective opportunities of work in the trade which is to be taught, and for this reason it is impossible to hold out hope that every man who requires vocational training after an accident can be accepted for training. Any new scheme should be so arranged that practically all the men who take the training are, without any unreasonable delay, absorbed into employment or work in the trade for which they have been trained.

Finally, the Ministry of Labour's experience is that the range of ages at which training can be given with sufficient success to enable a man to earn his living at a new trade is narrow. Up to the age of 25 or 26 men remain fairly readily adaptable over a wide range of occupations. Adaptability then declines sharply, though if a man has previously been a skilled worker he can be successfully trained up to about the age of 35 for a new trade which is fairly closely allied to the old one. It is of little use as regards most occupations attempting vocational training in the case of men who are more than 35 years of age,

unless the new work is merely a slight adaptation of what the man has been previously doing.

After reviewing the position in the light of all the evidence briefly summarised above we are of opinion that the Ministry of Labour should be invited to establish, as an experiment, a Centre for the training of persons partially disabled by accidents on the lines indicated above, and that any necessary legislative authority to undertake this task should be obtained. While we contemplate that, as at present, a small number of cases will still be provided with suitable vocational training, as a matter of education, at Cripples' Training Colleges, some Voluntary Institutions, and Technical Schools; and also that a few will be admitted to special institutions for training at the instance of Public Assistance Authorities as at present we feel that, for comprehensive action reliance must be placed on a scheme centrally organised and managed by the Training Department of the Ministry of Labour.

Experience would soon show whether such a scheme was capable of restoring disabled people to employment by means of vocational training and whether it should be maintained and extended so far as necessary to meet the needs.

We are informed that the Ministry's Training Centres for the unemployed do not take anyone below the age of 18 and we would stress particularly the importance of young persons who have incurred some permanent disability being given the opportunity of being trained. Whether that can best be done in a Training Centre such as we suggest or in the educational institutions of the local authorities, voluntary institutions, etc., would be a matter for the Ministry of Labour to decide in consultation with the Board of Education.

Having regard to the limitations of any training scheme necessarily imposed by the age of the injured persons and many other factors, we do not pretend that the whole field will be covered by the steps suggested above. In our view the whole field cannot be covered by any feasible scheme; and there is likely to continue to be a considerable number of persons injured by accidents whose working capacity cannot be restored by any scheme which we are able to suggest.

We have interpreted "restoration of working capacity" as meaning the restoration of capacity to the extent of enabling a person again to earn his living by work, whether at his old occupation or at some new occupation, under normal conditions. There remains the closely related question of the disabled person who can never be restored to the extent of becoming fully self-supporting under ordinary conditions. There are a number of institutions catering for ex-service men in this category. Notably there are the village Centres at Papworth and Enham dealing respectively with cases of tuberculosis and psychoneurosis. At these centres cases, incapable of restoration to an

extent which would enable them to return to competitive employment, are housed permanently in cottages in the village and taught crafts which, exercised under the sheltered conditions of the centre, enable the disabled to maintain themselves in whole or in part. Papworth is prepared already to take cases of injury by accident and Enham would be in a position to do so provided maintenance costs were guaranteed. For certain types of cases we recommend that the services of these Institutions should be utilised. Unless such institutions are likely to increase in number, we cannot look to them to provide for more than a small proportion of the cases in which it is not possible to restore capacity to the extent of making the disabled person self-supporting in unsheltered conditions.

It is for practical reasons of convenience that we have suggested that the experiment of a training centre for vocational training of injured persons should be conducted by the Ministry of Labour, and in doing so we do not intend to suggest that the cost of this service should be thrown on the National Exchequer. Our view is that the cost of the vocational training should be provided otherwise. In the case of industrial accidents we suggest that the relation of the cost of the vocational training to the system of workmen's compensation should be considered by the Royal Commission. In the case of road accidents or other accidents for which damages are awarded by a court of law the cost of the vocational training might be provided for in the damages awarded. In other cases where the injured person could not afford to pay for his training it would be for charitable organisations or Public Assistance Authorities to provide the funds.

Some Public Assistance Authorities have already given evidence of their willingness to pay for vocational training likely to render a maimed person self-supporting. This practice may become more general when the advantages accruing from such training become more widely known. We think that the advantages should be impressed on Public Assistance Authorities by the Ministry of Health. The London County Council Public Assistance Committee have maintained some cases at the Cripples' Training College, Leatherhead Court, for this purpose.

We note that at the International Labour Conference of 1938 it was proposed that the question of the re-training and re-adjustment of the adult unemployed should be considered by the Conference in the near future, and that on the suggestion of the British Government representative the proposal was enlarged to cover other classes such as the one we are now considering. We hope that the study of this subject by the International Labour Organisation and its discussion by the Conference may throw more light on a problem in regard to which there is at present very little experience.

XVI.—THE HOSPITAL ALMONER'S DEPARTMENT.

It will be abundantly clear from the foregoing Chapters that at a number of points in the patient's progress through the several stages of his treatment towards the full restoration of his working capacity, he may stand in need of assistance or advice in regard to a variety of matters lying outside the province of the Fracture Clinic Surgeon and his staff. He may have anxieties about his home which are retarding his recovery; inquiries can be set on foot and approach made to quarters from which help can be obtained if needed. Or he may be worried by fears that he will have lost his job and that there will be no work for him when he has recovered; contact can be made with his employer and possibly an assurance obtained. On his discharge from the ward, he may need visiting and encouragement to persevere with the remedial exercises and keep up regular attendance at the clinic; or, if circumstances make it difficult for him to attend, some systematic arrangements are needed for keeping the surgeon informed so that he may, for instance, communicate with the patient's medical practitioner, and enlist his co-operation. At a later stage the patient may require reconditioning and can be given advice as to where facilities are available (e.g., at a Physical Fitness Centre). If he is left with a permanent disablement, and requires an artificial limb or other appliance, means can be found to assist him in procuring it and he can be directed to the centre where skilled advice as to the fitting of it is available: or it may be a case for vocational training for a new occupation and he can be directed to the appropriate agency. When the case is one in which light work would, at a certain stage, be beneficial in promoting full restoration of working capacity, some intermediary is needed between the clinic and the employer in regard to the kind of work which would be suitable and the possibility of providing it. If the patient is worried, or brooding, over the claim which he may think he has for compensation, he can be put in touch with social agencies, where they exist, that can give him disinterested assistance and advice, and so on. All these are matters which may have an important influence on a patient's restoration but in regard to which the Fracture Clinic itself can do little if anything. To deal with these requires someone with a recognised position, a high degree of experience in dealing with individual cases, and knowledge of the agencies which can help (knowledge that in many or most cases would not be possessed by the patient himself); and often entails personal investigation into the circumstances and home surroundings of the patient.

How is this "social service", the need for which may begin with the patient's admission to the clinic and continue to the end of the case, and which may make all the difference between success and failure, to be met?

In the case of disabled ex-service men after the war, a similar need was met by the local War Pensions Committee; but there do not, so far as we are aware, exist outside the hospitals any corresponding agencies to deal with the casualties in civil life.

In the modern type of Almoner's Department, however, as it has been developed in recent years, there exists such an agency as is needed. There is a growing recognition that "social" service of this kind is a necessary complement of the purely medical and surgical services of a hospital in the work of restoring the injured or sick to health, and in a number of hospitals to-day a trained and experienced almoner and staff are doing most, if not all of the work we have described above.

The Institute of Hospital Almoners which was founded in 1907 includes in its "List of an Almoner's Duties" (Report for the year 1937) such matters as the following: To report to the medical staff when desired on patients' home circumstances and history; to deal with patients' difficulties at home in order to contribute towards their ease of mind and consequent recovery; to arrange for the supply of surgical instruments and appliances; to assist patients to obtain diet or extra nourishment; to enlist the help of the Public Assistance Authorities and Charitable Societies when help is required for individual patients; and among the qualifications of an almoner, the Institute include "a sound knowledge of social legislation and of the many agencies that exist for the assistance of those in distress". As the Institute says in its last Report, "It is clear that women of character and personality are required and that they will need special training for this branch of social service". Such training is undertaken by the Institute, and a considerable number of almoners holding the Institute's certificate are now at work in the country.

It is obvious that a Department organized on these lines and adequately staffed with trained persons is in the best possible position, through its immediate contacts with the medical and surgical sides of the hospital, to give the service needed.

Unfortunately, it is only a small minority of hospitals at present that have provided themselves with such an organization and we would recommend very strongly that an Almoner's Department, with a trained staff and functions such as we have described above, should be regarded as essential to the organization of a Fracture Service (though of course its duties would not be limited to casualty cases) and should, where approval of a Fracture Service Scheme is required, be made a condition of approval.

XVII. OTHER MATTERS.

(a) *The Teaching of Fracture Treatment to Medical Students.*

The adequate instruction and training of medical students at the Teaching Hospitals of the country in the treatment of fractures is, obviously, an essential condition of the maintenance of an efficient Fracture Service.

The evidence we have received from a number of important witnesses leaves no doubt in our minds that in many cases the training in treatment of fractures at present is seriously deficient and that a modification of the present teaching arrangements is urgently needed. This unsatisfactory state of affairs may be traced to several causes.

The representatives of the Royal Colleges of Surgeons of England and of Edinburgh agreed with other witnesses that the field of surgery is now so vast and complicated that the most that can be done under present arrangements is (1) to instil the principles of surgery into the mind of the undergraduate medical student, and (2) to instruct him in the application of those principles to the diagnosis and treatment of particular surgical conditions, as seen in the wards and out-patient and casualty departments, *to the extent which the time available for the surgical curriculum permits*. While the principles of surgery can be taught partly by systematic lectures and partly by clinical lectures and ward classes, a satisfactory training in the application of these principles to individual conditions can be obtained only by practice, under what Sir Cuthbert Wallace described as the apprentice system. "Under that system" he said, "the student and house surgeon were part of the system and treated the patient. For instance, if you take an ordinary fracture, the student helped to put the fracture up and helped to make the plaster etc. He really got his fingers into the business. As you know perfectly well, you may read an account of how to do a thing and think you have completely mastered it, but when you try to do it you find there are loop-holes. These loop-holes are stopped by making a man take part in the treatment himself".

The opportunity of getting his "fingers into the business" should come to the student when as a surgical "dresser" in the wards, the out-patient department, the casualty department and special departments, he learns to treat cases himself under supervision. The "dresser" is supervised directly by the house-surgeon, intermittently by the surgical registrar or other senior surgical officer, and finally by the Chief Surgeon.

Every teacher and student realises that by far the most important part of clinical training and teaching is dressership in the wards. At this time a student is brought into immediate contact with the patient, he has to examine the latter's condition and

keep notes about it. He watches the treatment and progress of the case until discharged. He is present during any manipulation or operation.

Under the present system by which in-patient fracture cases are treated in the general surgical wards, the extent and nature of the student's training depends in part on the number and character of the cases brought into his ward for treatment, in part on the degree of interest and experience of the surgeon-in-charge in the treatment of such cases.

Surgical witnesses have agreed that, speaking generally, the interest of surgeons in fractures has decreased during the last 30 or 40 years. The advances of operative surgery in the treatment of the internal organs have tended to absorb their interest. During the same period, and partly for the same reason, in teaching hospitals in which fracture cases are admitted to general surgical wards, the number of beds available for fractures has frequently become strictly limited; any cases in excess of this limited number are referred to other hospitals—usually to the municipal institutions. Those that are admitted are retained for as short a time as possible. Possibly it is in part due to this that there has been a marked falling-off in the number of fracture cases sent to the Teaching Hospitals to such an extent that they are faced with a shortage which is creating difficulties for them in carrying on their work as teaching institutions.*

Practice in the diagnosis and treatment of fractures can also be obtained by students in the casualty department, in which many fractures are treated as out-patients; but in many cases a period of attendance in the casualty department is not an obligatory part of the hospital curriculum.

It is therefore not surprising that examiners in surgery and others have informed the Committee that candidates may present themselves for their final examination with no practical acquaintance with the features of common fractures. A surgeon attached to one of the London Hospitals stated to us that it was possible (and had happened) for a student to get his qualification without ever having seen a fracture treated; and Sir John Fraser, when giving evidence on behalf of the Royal College of Surgeons, Edinburgh, said he thought that was true of certain teaching institutions.

Although we understand that the general tendency has been as described above, we are far from assuming that it is universal. At some teaching centres the surgeons-in-chief attend daily in the wards and teach their students; obviously they have more time for the teaching of general surgery than surgeons who visit their wards once or twice weekly (as is customary at other

* We are informed, for example, that in 1935 a great London Teaching Hospital, with five surgical firms, treated only 168 fracture cases as in-patients, so that each student would only see on the average 17 fractures during his six-months' in-patient dressership. In another Teaching Hospital, with two surgical firms, only 43 such cases were treated, giving each student an average of 11.

centres), and fractures will, in common with other branches of surgical practice, receive more attention. Most general surgeons at teaching hospitals tend to have a special individual interest in some branch of surgery, such as the surgery of the abdomen, of the brain, or of other organs; and we have had personal assurances from some general surgeons that fractures are their special interest, and that their students receive adequate instruction in fracture treatment. We fully accept these assurances, but we are bound to recognise that only a minority of general surgeons are interested in fractures, and that the majority of medical students are taught by surgeons whose chief interests are in other branches of surgery.

At Teaching Hospitals in which fractures are segregated in a special department such as we recommend, the foregoing difficulties do not exist. The cases, instead of being scattered through all the surgical wards, are concentrated and are placed under the charge of a surgeon who is interested, and has specialized, in this class of case. All the conditions, therefore, for ensuring a thorough training in the treatment of fractures are present; always provided the arrangements are such that, as Sir Cuthbert Wallace put it, the student, as "dresser" "does get his finger into the pie to a certain degree". Sir John Fraser also stressed the advantages of a Fracture Department for teaching purposes. "Arrangements could be made for students to see a variety of types and methods, and my view is that the teaching would benefit from the segregation of fractures."

We have recommended that in every Teaching Hospital a Fracture Department should be established, and it follows that a period of training in that department should be made an obligatory part of the curriculum of the medical student. Exactly the same development has taken place at an earlier date in the case of subjects like ophthalmology, gynaecology and diseases of the ear, throat and nose. All these subjects have been recognised as specialised; students have been afforded opportunity of instruction in them and this instruction has been made obligatory. The need for such instruction in the matter of fractures is, we think, at least as necessary as in many of the other specialities. Pending the establishment of a Fracture Department at any Teaching Hospital, arrangements should be made for the attendance of its students in the Fracture Department of some other hospital.

The practical question arises how this specialised training in the treatment of fractures is to be fitted into the curriculum. At present six months is assigned to practical work in the surgical wards and the witnesses from the Royal College stressed the importance of that period of apprenticeship which the dresser serves to one surgeon.

We discussed the question with the witnesses, and Sir Cuthbert Wallace agreed that it was really a matter of arrangement. He said: "I do not myself see why a certain amount

of time should not be taken out of that six months for the purpose of going to another department . . . while the man is doing his six months' training. I am not one of those who think you want to keep him in the theatre all day long while the surgeon is operating."

The method by which the arrangement for attendance in the Fracture Department can most conveniently and efficiently be made is a matter for the consideration and decision of the authorities of the Teaching Hospitals; but we may mention that it has been suggested to us that it would not be unreasonable to divide up the six months into three periods instead of two (as is done at present) so that a student could dress for two periods of two months each for a general surgeon and for two months for the orthopaedic surgeon and the fracture department. Even one month spent in daily attendance in a fracture department would be much more valuable than the haphazard seeing of odd cases of fracture scattered over a six-months' dressership. Or if it is deemed that a six-months' dressership is all too short for surgical instruction then, it is suggested, an additional period of one to three months of dressership in the orthopaedic and fracture departments should be made compulsory. At present we understand that there are only three teaching hospitals where students are afforded the opportunity of in-patient dresserships in the orthopaedic and fracture wards.

We have stressed the importance of in-patient dressership because this must form the basis of practical experience. But we do not forget that out-patient demonstrations, practical classes, clinical and systematic lectures may also be vehicles of instruction. They are, however, of secondary importance and can easily be arranged. We are informed that in America all first grade teaching hospitals provide clinical dresserships in orthopaedic and traumatic surgery which are compulsory for students.

The end to be aimed at is that all students should have, by the time of their final qualifying examination,

(a) a good knowledge of the general principles of fracture treatment,

(b) a practical knowledge of the application of these principles to the treatment of fractures of the different bones,

(c) practical experience of the diagnosis of fractures,

(d) an insight into the important part which the general practitioner has to take by co-operating in the later stages of rehabilitation of many cases.

(b) *Post-Graduate Study of Fracture Treatment.*

The course of training we have outlined above for the medical student will give him, by the time of his final examination, a knowledge of the principles of fracture treatment, and some

knowledge of their application in practice, and should make him capable of diagnosing in ordinary cases the nature of the injury and giving the preliminary treatment, but will not make him by that time an expert fracture surgeon. The knowledge and skill required for treating special types of surgical or medical cases can, in general, be obtained only by post-graduate instruction and practice. The treatment of fractures requires special practice and experience, and practitioners who propose to practise in regions where they will necessarily have to undertake responsibility for fracture treatment will need to equip themselves suitably by post-graduate work, as house-surgeons in hospitals and otherwise. With regard to the training of medical men for practice in this country in areas which can be served by a fully-equipped fracture department of a hospital, we consider that the minimum which we have laid down in the previous section, provided that the education in fracture work is carried out on the lines we suggest, is as much as can be asked of a candidate for medical qualification. It will enable him, in co-operation with the hospital, to secure for his patients the best treatment available in the locality. But although we agree that the undergraduate medical curriculum does not allow time for the ordinary student to acquire more knowledge of fractures than the minimum we have stated, we are satisfied that the more a general practitioner learns about fractures the more competent he is to co-operate in their treatment. We are glad to learn that fracture departments welcome visits from general practitioners in the neighbourhood, and are confident that such visits will improve co-operation between the practitioner and the hospital, and that patients will benefit.

Apart from the informal attendances which any general practitioner may make on his own initiative at fracture departments of hospitals, opportunities are now being given officially, by the Ministry of Health and the Department of Health for Scotland, for insurance practitioners to attend "refresher" post-graduate courses in general medicine and surgery, in which a session on fracture treatment is frequently, though not always, included.

These refresher courses are arranged at the chief centres having medical schools. A course lasts a fortnight. A programme of lectures and demonstrations is submitted by the Dean of the Medical School for approval by the Minister or the Department of Health for Scotland. The fees for the course, the travelling and subsistence allowances of practitioners, and in approved cases the cost of a locum tenens, are paid out of the residue of the Unclaimed Proceeds of Stamp Sales. It is understood that the arrangements are on such a scale as will eventually enable eligible practitioners to attend a course every five years. In England 42 post-graduate courses were provided in 1938, of which 20 were provided at the British Post-Graduate Medical School and 22 at Provincial Medical Schools. Of the

20 courses in London 17 had one session devoted to the treatment of fractures, but in the provinces fractures appeared in the syllabus only occasionally.

We recommend:

That the Minister of Health and the Department of Health for Scotland should consider the desirability of the inclusion of a session on fracture treatment as a more regular feature of these post-graduate study courses.

These arrangements, it will be observed, only apply to one section of the medical profession. It seems desirable that similar courses should be available for other branches of the profession: such courses have, we are informed, been held very successfully at Fracture Clinics in Liverpool, Manchester and Bristol.

There are two other types to consider:

(a) For well-qualified young surgeons who may have to take part in the treatment of fractures in civil hospitals abroad or in the hospitals of the services, but will not be called upon to *direct* an organised fracture unit, the necessary experience can be gained by a period as a surgical assistant in a large fracture service. The time required will vary with the different individuals; from three to six months will probably suffice for the majority.

(b) For a man destined to take charge of a fracture service a longer apprenticeship is needed. He should spend from three to five years as Chief Assistant or Registrar in a recognised teaching unit.

The large fracture departments now available in certain teaching hospitals provide opportunities for training both types of man. The most systematic course perhaps is established at Liverpool, where fracture treatment is a subject included in the examination for the degree of M.Ch. (Orthopaedics), but facilities for holding paid appointments or unpaid clinical assistantships exist in Manchester and one or two other centres. It was, moreover, strongly urged upon us by one of the representatives of the Royal College of Surgeons (Professor Grey Turner, the Director of the Surgical Unit of the British Post-Graduate Medical School at Hammersmith) that there is a definite need of better provision for systematic post-graduate instruction and practice in fracture treatment in London, and he suggested that it might be developed in association with the Post-Graduate Medical School where a small fracture unit has already been established and post-graduate instruction given. He laid stress especially upon the value of such a centre for practitioners and students from the Colonies and Dominions. He said:

“At the British Post-graduate Medical School, the students are drawn for the most part from the remoter parts of His Majesty's Dominions and many of them are working in very out of the way places. A good many are in general

practice, but a practice which is so isolated that they are required to undertake surgical work and to be able to turn their hand to any type of case. The same thing applies to those who are frankly devoted to surgery, for they often live in small, out of the way towns and have to be able to do the best for their patients, whatever the type of accident or disease encountered. These students are all very anxious to see the methods that have been evolved in recent years and are now commonly employed in dealing with traumatic surgery in general and fractures in particular. For them it does not suffice merely to give lectures or demonstrations irrespective of the high quality of such teaching. What they do require is to observe over a continuous period cases of difficulty from the time of their admission to hospital and throughout the whole course of the treatment. It may be intended in any one case that such and such a method of treatment is to be employed, but it may be discovered in the course of treatment that various changes have to be made when the results do not appear to be turning out as expected, or a complete alteration of plan may have to be adopted. The students also require to learn the exact technique of the application of the various methods employed and the apparatus which is used, and to make the teaching complete, they ought to have the opportunity of observing the after results. As in all efficient teaching, continuity is essential."

We consider that there are very strong grounds for the establishment of a fully-developed centre for post-graduate work in connection with the treatment of fractures, which would serve as a centre for research and for focussing and diffusing information as to developments both in this country and abroad as well as for the instructional purposes indicated by Professor Grey Turner.

Where and by whom such a centre should be established is hardly for this Committee to say: but it is very desirable that it should be associated with the centre for post-graduate work generally, at present situated at Hammersmith, or a centre of a similar kind. The situation of the Hammersmith Hospital makes it rather inaccessible for patients, so that the number of cases of fracture in the special department is at present insufficient to offer full opportunities for post-graduate study. It might possibly, however, be enlarged, by arrangement with the L.C.C. and other hospitals in the neighbourhood, so as to make it a centre for the treatment of from 500 to 1,000 fracture cases a year.

We recommend that the question of developing such a centre should be taken up by the Ministry of Health in consultation with the Royal College of Surgeons and the Governors of the British Post-Graduate Medical School.

(c) *Special Accident Hospitals.*

We have heard that the establishment of a special hospital for the treatment of accidents has been considered by industrialists and others in at least one important industrial centre. That such a hospital can do most valuable service has been demonstrated by Dr. Böhler's Clinic at Vienna. The concentration of cases under the care of a highly specialised and experienced staff facilitates the advancement of knowledge, and the development and improvement of methods of treatment and technique, and provides exceptional opportunities for instruction and training. Such hospitals might in this way play an important part in the development of fracture services, and accident services generally, throughout the country. In view of the valuable lessons which their experience might be expected to afford, and of the other advantages, not least the advantages to industry, we would certainly not wish to see the establishment of some such hospitals discouraged, or any obstacles placed in the way; but there are certain conditions which, in our judgment, would need to be fulfilled to ensure the smooth working and full efficiency of a special accident hospital.

In the first place, it would have to receive *all* classes of injury by accident. Its services could not be limited to particular classes of injury as, for instance, fractures. This would be impracticable without a "clearing house" system. It is only at the hospital, in most cases, that the nature of the injury can be accurately diagnosed.

In the second place, it follows from this that a special accident hospital should be in very close association with a general hospital, in order to have the advantage of the advice and collaboration of other specialist services. It is necessary to bear in mind that, as Sir Cuthbert Wallace put it to us, "traumatic surgery covers such a lot of ground. A man may have a crack on the head or a ruptured intestine. You cannot expect a man to specialise in all those things. They really belong to different departments." It would be advantageous if it could be arranged that the accident hospital should immediately adjoin or be in the close neighbourhood of the general hospital.

In the third place, it should be open to receive non-industrial as well as industrial accidents. The advantages to which we have referred would not be fully realised if its services were limited to industrial cases, and we foresee that difficulties would arise in the working of such an arrangement.

Lastly, the services of the hospital should be available for teaching.

XVIII.—SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.

We close our Report with the following summary of our conclusions and recommendations, in order to facilitate a judgment of them as a whole. The summary is necessarily highly condensed, and for the consideration of the grounds on which they are based reference must be made to the body of the Report.

1. The total number of injuries by accidents of all kinds treated yearly in the hospitals of Great Britain is in the neighbourhood of one and a quarter millions. The figures for 1935, supplied to us by the hospitals, were about 1,303,478, of which fractures and allied injuries accounted for 204,738.

These figures represent an enormous annual loss to the community in loss of working time, production, wages; in compensation and sickness benefit, and in other ways.

2. Fractures and allied injuries constitute—if both the number and the degree of disablement caused are considered—much the most important group of injuries by accident.

While not dissenting from the view that the ultimate aim should be the institution of a general traumatic service, we consider that for the reasons stated in our Report progress will best be made by dealing first with the institution of fracture services, and we recommend that in the first instance the efforts of all concerned should be concentrated on this.

At the same time we agree with the view that has been expressed to us by distinguished authorities that some at least of the principles on which an efficient Fracture Service should be based apply to other forms of injury and we make certain recommendations as to this.

3. We find that the system which was universal till a comparatively recent date and still prevails to a great extent in the hospitals of the country, by which fractures are treated in the general surgical wards and under the general surgical routine, is gravely defective, and that a radical change of method is necessary.

The most authoritative surgical opinion of the country is agreed in recommending the institution of special Fracture Services throughout the country. The same view is taken by the Association that represents the British Hospitals. In a number of hospitals such Services have already been instituted, and the unanimous testimony of those who have been working them is that periods of disability are shortened and improved results are obtained.

4. Such services should be based on three principles:—

(a) All fractures (except head) should be segregated in a single Department which would provide for both in-patients and out-patients.

(b) The Service should be operated and controlled by a single team under a surgeon-in-charge.

(c) The treatment should be continued until restoration of working capacity has been effected to the fullest possible extent.

The Service should be inspired by the determination to see the patient through the different stages of his treatment until the best possible end result has been obtained; and the patient's realisation of that will be one of the important factors in promoting and expediting his recovery.

5. The organization of an efficient Fracture Service therefore should provide for both the stages into which the treatment falls:—

(a) The surgical treatment for securing the union of the broken bone;

(b) The treatment by physio-therapy or remedial exercises or both for restoring the functional activity of the broken member.

An important part of the Service is the "follow up" and after-care, which calls for a careful system of record-keeping.

6. The first stage calls for a surgical team under a surgeon-in-charge experienced in treatment of fractures, a nursing staff trained in fracture work, a radiographic service and a record-keeping staff. We make suggestions, based on the experience of existing Fracture Services, as to the staff required for hospitals of different sizes. The accommodation required, which is set out in detail in the body of our Report, should include special wards assigned to the Department and a shock room or equivalent provision.

The necessary provision in these two respects—staff and accommodation—can in many, probably most, cases to a large extent be made by a rearrangement of existing hospital services and accommodation. Some additions to staff however will be necessary in most cases, and in some extension of accommodation by new building.

7. The requirements of the second stage will, as regards the physio-therapy, be usually met by the existing hospital physio-therapy service, but as regards the provision for remedial exercises will call for a great extension of existing facilities. In most hospitals, at present, the provision is very inadequate, in many non-existent.

We emphasize strongly the importance of this stage, and of the treatment being supervised and controlled by the Fracture Service surgeons. Where this stage has received little attention or been neglected, as it has too often in the past, the patient has tended to nurse his limb at home, instead of exercising it, the period of disability has been unduly prolonged and in many cases the full use of the limb has never been recovered.

On the other hand, we believe that if adequate provision is made for systematic remedial exercises under the direction of a trained staff and the supervision of the Fracture surgeons full restoration will be effected in the vast majority of cases and the patient will be discharged fully capable of resuming his normal occupation.

8. The remedial exercises necessary to restore full functional activity may be supplemented, or in part replaced, by "light work". Such light work must be of a character to assist in the restoration of functional activity. Jobs found or created merely for the purpose of giving the man something to do are of no use. The advice of the surgeon in charge of the clinic as to the kind of activity the man requires must be obtained, and the man remain under the general supervision of the Fracture Clinic until restoration of working capacity is complete.

9. The standard of efficiency reached in a Fracture Service will depend primarily on the detailed supervision and direction by the surgeon-in-charge of the treatment throughout both stages. This will involve his giving much more time to the work than is usually given by the visiting surgeon of a hospital, and if the best men are to be secured for the work, a substantial honorarium may have to be paid for their services. This has been found necessary in the case of some Fracture Clinics already established.

10. We recognise that in the institution of a Fracture Service on these principles at a hospital, it may not be possible always, under existing conditions, to carry out in full, at once, the arrangements indicated. In such cases, temporary provisional arrangements, which secure the main principles of a Fracture Service, can be made and we have seen good work being done under such conditions.

We recommend that active measures should now be taken to procure the establishment of efficient Fracture Services in all parts of the country.

11. Schemes for the establishment of such a Service should be worked out in consultation between the Local Hospital Authority of any area (i.e., County or County Borough Council) and the representatives of the Voluntary General Hospitals in the area. Such consultation will be greatly facilitated by the institution of Regional Councils of the Voluntary Hospitals, in accordance with the recommendation in the Report of Lord Sankey's commission*. It is much to be desired, and we strongly recommend, that a standing Joint Committee of the two bodies should be set up for this and other purposes of

* Report of the Voluntary Hospitals Commission (The British Hospitals Association), April 1937.

common interest, as has been done at Manchester, Liverpool, Newcastle-on-Tyne and elsewhere with successful results.

It should, we think, conduce greatly to the successful organization of a Fracture Service in any area if the other interests, in particular the local bodies representative of the medical profession, the organizations of employers and workers, and the ambulance authorities and associations, are consulted and their support and co-operation secured.

A full Fracture Service on the lines recommended should be established at every Teaching Hospital.

We recommend that the Government should invite the Councils of Counties and County Boroughs to take the initiative in the matter, to arrange for consultations as indicated above and, jointly with the other interests, to prepare schemes. Such schemes should be submitted to the Ministry of Health for examination and advice. In cases of areas from which no such schemes are forthcoming the Ministry of Health should itself hold a local Inquiry.

Medical Officers of Health should report from time to time on the working of fracture schemes in their areas.

12. The arrangements for the establishment of Fracture Services will necessarily vary according to the circumstances and conditions of the area. We have considered in detail, in the light of the evidence we have received from those with practical experience of the subject, the arrangements that would be practicable and adequate in areas of different kinds. For example, in a city or large town with more than one general hospital, it may be found best to concentrate the Fracture Service at one or more of them. In a county town with a cottage hospital, it will probably be found desirable to affiliate it with a Central Fracture Service in some large town. For predominantly rural areas, a scheme on the lines of one or other of the schemes worked from the Oswestry Orthopaedic Hospital or the Wingfield Morris Orthopaedic Hospital at Oxford may be found most suitable. For more or less isolated districts such as the Western Islands and other parts of Scotland, special measures will be needed.

13. The recovery of the patient is often affected, and retarded, by psychological factors over which the Fracture Service can have little direct control. They may be due to various causes—for example, to anxieties about his financial position and that of his family in view of the loss of income, about his prospect of employment or other matters, or they may result from some constitutional predisposition. There is general agreement that the efficient treatment of his case in an organized Fracture Department will go a long way to prevent some of these psychological states arising. It will be the aim of an efficient Service to create in him a conviction that he is going to have the best done to restore him to his old condition and

to get him back to work. The services of an efficient and adequately staffed Almoner's Department, which we consider to be a necessary adjunct to a Fracture Service, will be invaluable in dealing with his personal difficulties.

14. In so far as the adequacy of the present system of Workmen's Compensation to tide a man over his period of disability comes into the question, the appointment of a Royal Commission to review the present system and to inquire into its relation to arrangements for the treatment of injured workmen and the restoration of their working capacity has made it unnecessary for us to submit recommendations of our own. We would only say in general that the whole course of our inquiry has left us deeply convinced that in any remodelling of the system the rehabilitation of the injured workmen should be the primary consideration.

15. On one point alone do we feel it necessary to make a definite recommendation. For the reasons stated in the body of our Report, we consider that as long as the patient requires to be under treatment by the Fracture Service, he should continue to receive compensation as for total incapacity, unless he is found light work of a remedial character approved by the Fracture Surgeon and is earning wages.

16. We have anxiously considered whether, in those cases where owing to a constitutional predisposition or other cause a definite neurosis is developed, we could make proposals for their special treatment, institutional or other. The problem is only part, as witnesses pointed out, of a much wider problem relating to the community generally, and until experience has been gained of the effect of the other arrangements that we recommend, we do not feel that any definite conclusion can be reached. A Fracture Service should, of course, have facilities for consulting a medical psychologist when the surgeon-in-charge considers it necessary.

We would call special attention to the part of our Report in which this important and difficult subject is discussed.

17. We have had to consider what provision should be made for those cases in which the patient at the end of his treatment in a Fracture Department is not yet in a condition to return to his normal work. Under the system which still prevails in most hospitals, such cases have been very numerous. The number should be greatly reduced if our recommendations as to the provision for restoration of functional activity are given effect to in the institution of Fracture Services; but it is probable there will continue to be a number of cases, chiefly occurring among men employed in the heavy industries, where the patient, though he has regained the full functional activity of the injured member, is unequal to the physical strain of arduous work and needs a process of "reconditioning".

For some time to come also, it is to be anticipated that there will be a number of cases—how many it is impossible of course

to estimate—where because the hospital is not provided with adequate equipment for physio-therapy and remedial exercises, the patient has to be discharged before full restoration of functional activity is attained.

18. The reconditioning required may be given by means of suitable light work if available, and is being so given, with good results, in certain firms under medical supervision. Where this cannot be arranged, other remedial facilities should be organized. These might take various forms. The establishment of "rehabilitation centres" with facilities for indoor and outdoor exercises and for various occupations, has been urged by witnesses; such a centre is now being provided in the Midlands in connection with the coal mining industry. Another method would be to organize courses of exercise in connection with "Physical Fitness" centres.

19. In the absence at present of any basis for an estimate of the number of cases to be provided for, we have not felt able to put forward a definite scheme, but we make the following recommendations:—

(1) That systematic provision should be made for reconditioning (a) such cases as on discharge from the clinic need a course of "toning up" before they are equal to the strains and stresses of heavy manual work; and (b) cases in which complete functional recovery has not been effected in the hospital.

(2) That this in many cases can best be given by graduated work at the injured person's previous place of employment, and that the Departments immediately concerned should take up the question with the major industries of the country with a view to the thorough examination of the possibilities and to the organization of systematic arrangements for the purpose.

(3) That for cases where such work cannot be provided, facilities for remedial activities should be made available. Such remedial activities might be provided in connection with centres established under the Government's National Fitness movement, or (as is being done in some cases already by individual firms or voluntary societies) at special reconditioning centres, or otherwise. The local authorities should, in preparing schemes for Fracture Services, in consultation with the Hospital Regional Councils, include arrangements for the provision of such facilities.

It is very desirable that one or more experimental reconditioning centres should be started as quickly as possible.

20. Great stress has been laid by witnesses on behalf of the hospitals on the difficulty of meeting the additional expenditure, either in capital outlay or in maintenance cost, that might be involved in the establishment at a hospital of a separate Fracture

Department. We have given this aspect of the problem our fullest consideration and have examined and discussed in the body of our Report suggestions that have been made to us of possible sources of new revenue.

21. As to the expenditure likely to be involved, our conclusions are that in many cases, *but not necessarily immediately*, expenditure on the provision of new accommodation may be necessary. A start can be made by a reorganization of existing accommodation and redistribution of staff; this has already been done in a number of cases. When capital expenditure is necessary, we believe that the need will be met, as indeed is happening to-day, by the benefactions of public-spirited individuals and general public support, if the importance to the country of organized Fracture Services is realized. For this we look to the Government to give a lead.

22. As regards the cost of maintenance of a Fracture Department we conclude that, while certain substantial savings should result from the adoption of the new methods, there will, on balance, be an addition to the general expenditure of the hospital. We have expressed the opinion that, left to develop without any special stimulus, the institution of Fracture Services, like other specialized services, would *gradually* become general; and we desire to pay a tribute to the initiative in the matter that has already been taken by a number of hospital authorities and by private benefactors, organizations of employers, and other bodies. Such a development, however, would be slow and sporadic, and the urgent nature of the need for a reorganization of the treatment of fractures makes it important that the pace should be accelerated.

23. Our main recommendation under this head is that where, under a scheme drawn up in consultation between the Local Hospital Authority and the representative body of the Voluntary Hospitals in any area, it is agreed that the main provision of Fracture Services should fall upon the Voluntary Hospitals in the area, or some of them, and that their resources would be insufficient to meet the cost, an annual subvention should be made by the Local Authority under the powers given by the Public Health Act, 1936. We also recommend the abolition of the limits imposed by the Road Traffic Act on the amounts that may be recovered by a hospital for treatment of road accident cases, and an examination by the Government of the possibility of a larger contribution, by way of additional benefits, being made by the Approved Societies to the hospitals which establish adequate Fracture Services.

24. The proposals in the Report relate primarily to the treatment of fractures and allied injuries, but we desire, at the same time, to emphasize the need for reviewing the arrangements for the treatment of other classes of injury by accident.

While we do not consider it necessary to disturb the existing arrangements by which such injuries are treated under the general surgical routine, the principles of continuity of treatment and after-care have as important an application here as in the case of fractures. Complete restoration of working capacity should be the aim. We, therefore, recommend that in every hospital which handles accident cases

(1) the work should be so organized that, in all cases where working capacity is in danger of being impaired, control should be exercised and treatment continued until restoration is effected;

(2) the service should be organized and, where necessary, developed so as to make provision for the application of remedial exercises, etc., under supervision, in such cases.

25. Adequate First Aid and Ambulance services are essential to the efficiency of a " Rehabilitation " system.

So far as industry is concerned, we recommend that the arrangements now required by law should be regularly supervised by a doctor, that first aid men should be required to attend refresher courses, and to re-qualify at fixed intervals, and that, where the provision of an ambulance or first aid room is required, the person in charge should be required, in addition to an approved certificate in first aid, to obtain some form of special training on approved lines. Special attention should be given to the early treatment of shock in serious cases, before the removal of the injured man.

26. In the preparation of a scheme of Fracture Services for any area, the provision of an adequate ambulance service for the immediate transport of serious cases, possibly from a considerable distance, to the nearest Fracture Clinic will be an important element. We recommend that the invitation to the County and County Borough Councils to prepare such schemes should cover also the organization of the ambulance services of the area.

27. Our attention was called to the need for standardization in the design of ambulances and stretchers. The present diversities in design may, and do, lead to a badly injured man having to be moved unnecessarily from one stretcher to another, perhaps twice, in the course of his removal to hospital. We suggest, in view of the many different bodies concerned and the importance of the subject, that the Government may have to take the initiative in the search for a solution of the problem.

28. Our terms of reference cover the question of the training for a fresh occupation of injured persons who are left with some permanent disability and are unlikely, without such training, to find employment. Under the improved system for the treatment of fractures and allied injuries which we suggest,

the number of such cases should be small, but it is not possible to form at this stage any approximate estimate. Only experience can show the extent of the need. To provide for such cases, so far as it is possible, we recommend that the Ministry of Labour which has had experience of such work (e.g., in training the war-disabled) should establish, as an experiment, a Vocational Training Centre, and that any necessary legislative authority to undertake this task should be sought from Parliament. We do not consider that the cost of this service should fall on State funds. In regard to industrial cases, we suggest that the relation of the cost of the training to the system of workmen's compensation should be considered by the Royal Commission on workmen's compensation.

29. The evidence we have received convinces us that the training of medical students in treatment of fractures is, in general, seriously deficient and that a modification of the present arrangements is urgently needed. A period of training in the Fracture Department (which we have recommended for every Teaching Hospital) should be made an obligatory part of the curriculum.

30. Facilities should be provided for post-graduate instruction and practice in the treatment of fractures. We suggest that the Ministry of Health should consider (a) the inclusion of a session on fracture treatment in the refresher courses for doctors which it organizes, (b) the establishment in London of a centre for post-graduate work in connection with the treatment of fractures, which would serve as a centre for research and diffusion of information as to developments in this and other countries as well as for instruction.

31. We would call special attention to the arrangement made three years ago by which the expert services of Queen Mary's Hospital, Roehampton, and the Ministry of Pensions limb-fitting centres in the Provinces in the fitting of artificial limbs were made available for the civilian population. Expert surgical oversight and control of the supply and fitting of an artificial limb are essential if the best results are to be obtained, and the experience of the Ministry's services in this respect is unrivalled. Much greater use might be made of them than is the case at present. We have no information in regard to the future of these services as the number of war pensioners diminishes but it would, in our opinion, be a national loss if the expert services built up by the Ministry were to disappear. We recommend strongly that the possibility of keeping them in existence and making them a general public service should be considered.

32. Lastly, we would stress the importance of the services, lying outside the scope of the Fracture Department, which can be rendered in connection with a patient's case by the

trained staff of an Almoner's department as it has been developed in recent years at a certain number of hospitals. At present only a small minority of Hospitals have organized an Almoner's Department on such lines; and we recommend that an Almoner's Department with a trained staff and with functions such as are indicated in our Report should be regarded as essential to the organization of a Fracture Service.

We desire, on completing our task, to record our grateful appreciation of the help we have received during the course of a long and difficult inquiry from our two Secretaries, Dr. A. E. Quine, of the Ministry of Health, and Mr. J. A. Simes.

We have the honour to be,

Sirs,

Your obedient Servants,

MALCOLM DELEIVINGNE,

(Chairman).

MURIEL C. BYWATERS.	JOHN MARCHBANK.
W. A. COCHRANE.	A. W. NEVILLE.
G. L. DARBYSHIRE.	HAROLD R. PINK.
WM. ELGER.	E. PRIDEAUX.
T. FERGUSON.	H. S. SOUTTAR.
ERNEST W. HEY GROVES.	GUY DE G. WARREN.
GUY F. JOHNSON.	H. H. WILES.
WILL LAWThER.	A. C. T. WOODWARD.

A. E. QUINE,	} (Joint Secretaries).
J. A. SIMES.	

RESERVATION BY MR. A. C. T. WOODWARD.

While agreeing with the main body of the report I am not satisfied that the financial suggestions go far enough. Although our terms of reference were to consider the treatment of injuries I cannot view the matter in a closed compartment but look forward to better facilities for improved Institutional treatment in other directions.

I suggest that provision should be made for Hospital benefit under a revised National Health Act.

This would have the added advantage of placing the treatment of those who at present come under the Workmen's Compensation Acts under a National Health Service rather than the present "compensation" atmosphere. Only when the treatment was finished would any disability remaining be assessed for compensation.

This would prevent much litigation and many cases of neurasthenia.

A. C. T. WOODWARD.

APPENDIX O.

LIST OF WITNESSES, &c.

I. APPEARING ON BEHALF OF ORGANISATIONS, &c.

Accident Offices Association ...	Welson, J. B., LL.M.
Association of Counties of Cities in Scotland.	Guy, John, M.D., F.R.C.P.Ed. Macgregor, A. S. M., O.B.E., M.D., D.P.H. Robertson, D., LL.B.
Association of Industrial Medical Officers.	Jenkins, W.D., M.R.C.S., L.R.C.P. Lockhart, Leonard P., M.D. Maitland, T. G., M.D., D.Phil. Stewart, Donald, M.D., M.R.C.P.
Association of Municipal Corporations.	Mitchell, Alderman Sir Miles, J.P. Jervis, J. Johnstone, M.D., D.P.H.
Astley Ainslie Institution ...	Cunningham, Lt.-Col. J., C.I.E., M.D. Langmaid, Miss G. Miles, Alexander, LL.D. F.R.C.S.Ed.
British Hospitals Association ...	Griffiths, Arthur Orde, R. H. Ryan, H. E.
Do. Scottish Branch ...	Knox, J. C., M.B., B.Sc., D.P.H. Maw, Harry. Patrick, J., M.B., F.R.S.C.E. Smith, B. McCall, M.B., Ch.B. Stewart, Lt.-Col. A. D., C.I.E., M.B., F.R.C.S.Ed., F.R.S.Ed.
British Hospitals Contributory Schemes Association.	Place, T. W.
British Medical Association & Trades Union Congress General Council, Joint Committee.	Citrine, Sir Walter, K.B.E. Hill, C., M.D., D.P.H. Smyth, J. L. Watson-Jones, R., M.Ch., F.R.C.S.
British Orthopaedic Association	Elmslie, R. C., O.B.E., M.S., F.R.C.S.
Central Council for the Care of Cripples.	Elmslie, R. C., O.B.E., M.S., F.R.C.S. Nangle, Miss I. M. Peto, Geoffrey, C.B.E.
Convention of the Royal Burghs of Scotland.	Keith, Sir Henry, LL.D. Rutherford, Ex-Provost J.R.
Glasgow : Senior Surgical Staffs of Royal & Western Infirmaryes.	Burton, Prof. A. G., M.C., M.B., D.P.H., F.R.C.S.Ed. Young, Prof. Archibald, B.Sc., M.B., F.R.F.P.S.Glas. Young, Roy. F., M.C., M.B., F.R.F.P.S. Glas.
Lanarkshire Orthopaedic Association.	Little, J. W., M.B., Ch.B. McFeat, Geo., M.B., C.M. Ross, J.
National Confederation of Employers' Organisations.	Allen, H. E. Boyd, J. S. Brand, H. F. Forbes-Watson, Sir J. B., K.B.E., LL.D. Kirkaldy, H. S. Piper, H. M.

Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswes- try.	Keon-Cohen, Bryan, F.R.C.S. Menzies, John, C.
Royal College of Surgeons, Edin- burgh.	Fraser, Sir John, K.C.V.O., M.C., M.D., F.R.C.S. Stewart, W. J., M.B., Ch.B., F.R.C.S.Ed. Struthers, J. W., M.B., Ch.B., F.R.C.S.Ed.
Royal College of Surgeons of England, Council of.	Barling, Prof. Seymour, C.M.G., M.S., F.R.C.S. Grey-Turner, Prof. Geo., M.S., F.R.C.S. Wallace, Sir Cuthbert, Bart., K.C.M.G., F.R.C.S.
Royal National Orthopaedic Hospital.	Morley, Arthur, C.B.E., K.C.
Wingfield - Morris Orthopaedic Hospital.	Girdlestone, G. R., M.B., B.Ch., F.R.C.S.

II.—INDIVIDUALS.

Brend, W. A., M.D., B.Sc.
 Buller, Dame Georgiana, D.B.E., R.R.C.
 Griffiths, H. E., M.S., F.R.C.S.
 Lane, Ronald E., M.R.C.P.
 Lyon, F. A.
 McMurray, T. P., M.Ch., F.R.C.S.
 Mason, Alec.
 Moore, H. E., M.B., Ch.B.
 Pridie, K. Hampden, F.R.C.S.
 Terry, Herbert, M.B., Ch.B.
 Watson-Jones, R., F.R.C.S.

III.

The Committee is also indebted to the following for information supplied in the form of written statements, memoranda, statistics, &c. :—

Agricultural Workers, National Union of.
 Ashington Coal Company, Limited.
 Bonar, A. Anderson, F.R.C.S.
 Buxton, N. St. J. G. D., F.R.C.S.
 Croll, W. F., M.B., Ch.B.
 Crooks, F., F.R.C.S.
 Donovan, P. T., F.R.C.S.
 Eastwood, W. J., F.R.C.S.
 Ellis, V. H., F.R.C.S.
 Fisher, S. W., M.D., H.M. Medical Inspector of Mines.
 Grey, C. H., F.R.C.S.
 Griffiths, H. E., M.B., F.R.C.S.
 Grosvenor, Chetwynd J. P., M.B., B.Ch.
 Harris, H. A. H., F.R.C.S.
 Irwin, C. Gordon, F.R.C.S.
 Lyon, F. A.
 Munro, Air Vice-Marshal Sir David, K.C.B., C.I.E., F.R.C.S.Ed.
 Nursing, College of.
 Ollerenshaw, R., F.R.C.S.
 Ord, A. G., F.R.C.S.
 Platt, Harry, F.R.C.S.
 Russell, D. H., F.R.C.S.
 Snowden, E. N., M.B., B.S.

IV.

LIST OF HOSPITALS, INSTITUTIONS, &C., VISITED BY, OR ON BEHALF OF,
THE COMMITTEE.

Ashington Hospital, Northumberland.
 Bristol : General Hospital.
 „ : Royal Infirmary.
 Cardiff : Llandough (Municipal) Hospital.
 Chloride Electrical Storage Company.
 Crewe : L.M.S. Railway Hospital.
 Cripples' Training College, Leatherhead Court.
 East Suffolk and Ipswich Hospital.
 Edinburgh : Astley Ainslie Institution.
 „ : Princess Margaret Rose Hospital for Crippled Children.
 „ : Royal Infirmary.
 Enham Village Centre.
 Kent and Canterbury Hospital.
 Liverpool : Royal Infirmary.
 London : Albert Dock Hospital.
 „ : Charing Cross Hospital.
 „ : Guy's Hospital.
 „ : Queen Mary's Hospital for Limbless Men, Roehampton.
 „ : Royal Free Hospital.
 „ : Royal National Orthopaedic Hospital, and branch at Stanmore.
 „ : Royal Northern Hospital.
 „ : St. Mary's Hospital, Paddington.
 „ : West London Hospital.
 London Brick Company, Stewartby, Beds.
 Manchester : Ancoats Hospital.
 „ : Royal Infirmary.
 Manchester Collieries, Ltd., Physio-therapy Clinic.
 Ministry of Labour—Instructional Centres : Allerston
 „ „ „ „ : Langdale End.
 „ „ Training Centre : Watford.
 Ministry of Pensions Hospital, Cosham, Hants.
 Newcastle-on-Tyne : Royal Victoria Infirmary.
 North Staffs : Royal Infirmary, Stoke-on-Trent.
 „ : Cripples' Aid Society Orthopaedic Hospital.
 Salford : Royal Infirmary.
 Sheffield : Edgar Allen Institute.
 „ : Royal Infirmary.
 „ : Royal Hospital.
 York County Hospital.

Germany—

Bochum (Westphalia) and Gelsenkirchen (Buer) : Miners' Accident
 Hospitals.
 Cologne : Municipal Hospital, Surgical Department.
 Essen : Krupp's Hospital and Works.
 Frankfurt (Main) : Municipal Hospital, Surgical Department.
 Vienna : Unfallkrankenhaus (Dr. Lorenz Böhler).
 „ : General Hospital, Surgical Department.

APPENDIX P.

STATISTICAL INQUIRY INTO THE RESULTS OBTAINED AT
FOURTEEN ORGANISED FRACTURE DEPARTMENTS.

REPORT.

The Committee deemed it advisable to obtain, for publication if possible, a conspectus of the results which were being obtained in organised fracture departments. In order that the investigation should be carried out on uniform lines, a form of inquiry was drawn up, after consultation with the co-operating surgeons, the object in view being to secure adequate information while avoiding over-elaboration. The form is appended, together with the notes issued with it to secure its completion on uniform lines, and a schedule of the types of fracture to which the inquiry was mainly directed.

The net total of effective cases reported on was 6,364.

Distribution of cases according to sex, age, and class of fracture.

Table I shows:—

(a) How these 6,364 cases were distributed between the different classes of fractures.

It will be seen that, as is well known to surgeons, by far the largest numbers of fractures are those of the lower end of the radius, which includes the large group of fractures commonly known as "Colles'" fracture of the wrist.

(b) How the 6,364 cases were distributed as between the two sexes and at different age-periods of life. It brings out certain facts well known to those engaged in fracture work but which might also be of interest to a wider public. For instance, it is interesting to note how the sex incidence of Colles' fractures changes with advancing years. In the age groups 0-15 and 15-25 the patients are mostly males but in the age-groups 45-65 upwards they are predominantly females.

Again it will be observed that the patients suffering from fractures of the lower end of the humerus (Nos. 7A and 7B in the Schedule) are mainly under the age of 15 and that the same is also true of fractures of both bones of the forearm and of fractures of the shaft of the femur. Certain fractures, again, are clearly associated with the working periods of life; this is particularly true of fractures of the spine, fractures of the toes, metatarsals, fingers, metacarpals and the ankle. Though not shown in this Table it was interesting to note that fractures of the toes were particularly numerous in the returns of Fracture Departments situated in the vicinity of mining areas.

Altogether it will be noted that of the 6,364 cases, 4,087 were males and that, taking all classes of fractures together, males outnumbered females by more than 2 to 1 in the first 15 years of life, while the ratio was reversed among elderly patients, viz. those aged 65 and over.

The incidence of complications.

Table II shows the incidence of complications among the 6,364 cases reported on, taken as a whole, and their incidence as between the several classes of fractures. It will be noted that the ratio of uncomplicated to complicated cases is almost exactly 10 to 1 (5,793 to 571) and that in over one half of the complicated cases (309 out of 571) the complication arises out of the fact that the injury was a "compound fracture", i.e. the skin over the site of the fracture was broken, giving rise to the danger of infection.

Taking the individual fractures it will be noted that fractures of the fingers are particularly prone to be compound and that the same is true to a lesser extent of fractures of the toes. In fractures of the shafts of the tibia and fibula, also, the commonest complication is the presence of a compound fracture but, compared with fractures of the fingers and toes, a larger proportion of the complications is due to the presence of multiple fractures or other severe injuries. Multiple fractures also provide the largest proportion of the complications noted in fractures of the shaft of the femur, the ankle (without displacement), the os calcis, the shaft of the humerus, the head of the radius, the lower end of the radius and the scaphoid of the wrist. In fact in the last named the presence of multiple fractures is the only form of complication noted. In supracondylar fractures of the humerus the commonest form of complication appears to be the association of other severe injuries.

Compensation cases.

Allied to the question of the part played by complications in delaying recovery and prolonging the period of disability is the question of the importance of the role played by claims for compensation. It has frequently been asserted that recovery appears to be delayed and the necessary period of treatment to be thereby prolonged in cases which are the subject of litigation. Although no satisfactory means could be devised of statistically investigating the facts of the matter it was thought that it would be interesting to ascertain the proportion of cases in which such claims arise. Accordingly a question on this subject was included in the Inquiry Form.

Only five of the 14 Fracture Departments were able to give the information desired under this head but their combined returns relate to a total of 2,131 cases of fracture. Of these 634, or approximately 30 per cent., were compensation cases, the great majority (590) of which were cases in which the claims arose out of injuries received in employment.

Delay in seeking treatment.

Amongst other factors which might be expected to have an adverse influence on the duration and results of treatment in cases of fracture is delay in seeking treatment. The frequency with which a delay occurs is shown in Table III. It will be seen from this Table that it is not only in cases of fracture of the upper limb that patients frequently wait several days or even weeks before seeking advice, but that such a delay occurs almost as frequently in cases with fractures of the lower limb.

Another curious point in regard to this delay in seeking treatment was that it appeared to occur more frequently in the areas served by some Fracture Departments than in others.

In-patient treatment.

The proportion of cases receiving in-patient treatment for the various classes of fractures and the average length of stay of such cases in hospital is shown in Table IV in relation to fractures of the upper and lower limb respectively.

The information to be gathered by studying the figures shown in this Table is instructive since it indicates the relative requirements of each group of fractures in respect of in-patient accommodation.

Duration and results of treatment, as affected by the presence or absence of complications.

In Table V the results of treatment are recorded in 5,080 cases of simple fracture without complications. These results are grouped under the headings of the four columns in which they are recorded in the returns, viz. (1) "Function was fully restored", (2) "Complete recovery was expected, without further treatment", (3) "A state of permanent partial loss of

function was stabilised " and (4) " Function was totally and irretrievably lost ". At the same time the average duration of treatment is given in respect of each class of fracture for all cases except those in which function was totally lost (the surgeons were not asked to supply any particulars as to the duration of treatment in such cases).

Table VI gives similar information regarding 562 complicated cases.

On comparing these two Tables (V and VI) it will be seen that, as one would expect, there was a much larger proportion of unsatisfactory results (viz. cases in which a permanent partial loss of function was stabilised or in which function was totally and irretrievably lost) among the complicated cases than among the uncomplicated. Thus, for instance, taking all the various classes of fracture together, Table VI shows that out of 562 complicated cases no fewer than 154 (or 27.4 per cent.) were in this sense unsuccessfully treated, whereas Table V shows that unsatisfactory results were obtained in only 337 cases (or 5.8 per cent.) out of a total of 5,791 uncomplicated cases treated. There is also a general indication that on the whole the average length of treatment tends to be longer in complicated than in uncomplicated cases, the difference being more especially noticeable in connection with those cases in which a satisfactory result was not obtained, viz. those in which a permanent partial loss of function was stabilised.

The figures illustrate a recognised fact, i.e. that the presence of complications exerts an adverse influence on the duration and results of treatment and that therefore in comparing the duration of treatment in any two series of cases it is necessary to eliminate first the cases with complications.

It must not be inferred that the average periods of treatment shown in these two Tables afford a reliable indication of the average duration of treatment required in any particular type of case; indeed it will be clear that many of these " averages " are calculated on such very small numbers of cases that no conclusions can be drawn therefrom. Moreover, it may be noted that the figures relate to patients at all ages, and reference to Table I will show that in some kinds of fractures the larger number of cases are in children.

Apart from the fact that the " average " is an unreliable figure when calculated from small numbers of cases, it is in any case an unsatisfactory standard to use, at least by itself, as an indication of the probable duration of treatment. This will be seen clearly from Table VII where the duration of treatment is analysed in respect of the fifteen classes of fractures in which the largest number of cases without complications were successfully treated, i.e. those in which function was fully restored or the surgeon considered that complete recovery was to be expected without further treatment. The Table is self-explanatory and it will be obvious that in each class of fracture the existence of a few isolated cases in which treatment was for various reasons unduly prolonged must have the effect of raising the average duration of treatment and that therefore the " average " does not represent the commonest or most usual period. In other words a patient suffering from any of these fractures would have reason to consider himself unfortunate if he had to remain under treatment for the average period.

Table VII shows very strikingly the great difference in duration of treatment for each class of fracture between the two extremes. It also shows the proportion of cases in which treatment was completed within certain periods and the Mean (or average) duration of treatment, in days, for each class of fracture.

Certain statistical terms have been introduced into this Table, viz., the " Standard Deviation ", the " Coefficient of Variation " and the " Median ", which require some explanation.

The "Standard Deviation" is a measure of the variability of the periods of treatment of the cases in this series around the Mean (or average) period. In other words, if in a large proportion of cases the duration of treatment was very similar to the average period, the Standard Deviation would be small. But if in a large proportion of the cases the periods differed very widely from the average, the Standard Deviation would be relatively large.

The "Coefficient of Variation" is a further measure of the variability of the periods of treatment and represents the Standard Deviation as a Percentage of the Mean.

The "Median" represents the period, in days, for each class of fracture at which exactly half the cases had completed their treatment, and it will be noted that in all these fractures the Median is a shorter period than the Mean or Average.

Finally, the Table shows for each class of fracture the particular week in which the largest number of cases were discharged on completion of their treatment. In certain classes of fractures the number of cases discharged in consecutive weeks rapidly increases to a definite peak and then diminishes almost as rapidly and gradually dies off, while in other classes of fractures the maximum number of discharges per week is spread over a period of several weeks. In other words, in these latter classes no particular period can be indicated as the one in which the treatment is most likely to be discontinued in the largest number of cases. These differences between the various classes of fractures can perhaps best be appreciated if the facts are set out in diagrammatic form, and a number of diagrams are accordingly appended herewith for purposes of illustration.

It will have been noted that in Table VII cases in which function was fully restored are not differentiated from those cases in which treatment was discontinued because, in the opinion of the surgeon, complete recovery was expected without further treatment, the two classes being lumped together as cases "treated to a successful conclusion". The reason for doing this is that it was evident from the returns that the practice of the different Fracture Departments varies somewhat in regard to the discontinuance of treatment when a stage is reached at which it appears that further treatment is not required.

It will already have been noted from Table V that out of a total of 5,791 cases of "simple fracture", without complications, treated to a conclusion by the fourteen Fracture Departments, 4,090 (or 70.6 per cent.) were written off as "function fully restored" but that in no fewer than 1,364 (or 23.5 per cent. of the total) treatment was discontinued because, in the opinion of the surgeon, complete recovery was expected without further treatment, the ratio between the total of such cases and the total in which function was fully restored being approximately 1 to 3.

D. J. WILLIAMSON.

EXPLANATORY NOTES.

1. *Scope of the Return.*

(a) As stated in the heading to the form, information is desired regarding a consecutive series of unselected cases of the types specified, seen for the first time not later than 30th June, 1937, and treated throughout by the Department. It follows that *the following cases, alone, should be excluded, viz. :—*

(1) Fractures other than those listed in the Schedule. (See note 5 below.)

(2) Cases first seen later than 30th June, 1937.

(3) Cases partly treated elsewhere than in the Department or by the staff thereof. (See notes 9 (a) and (b) below.)

(4) Cases in which treatment was discontinued for any reason, other than death, without the Surgeon's approval. (See note 10 (b) below.)

(5) Cases in which death occurred prior to the commencement of fracture treatment proper, as distinguished from mere casualty treatment. (See note 12 (b) below.)

(b) It is immaterial how many cases are reported on provided a consecutive series is taken according to the date of their first attendance, without selection, omitting only those mentioned above.

(c) The period to be covered by the inquiry need not be the same for each hospital, though it is desirable that it should be the most recent for which complete returns are available. Ordinarily (in Departments with a large annual turnover) it is anticipated that the returns will relate to cases first seen during the first six months of 1937, but smaller Departments may find it desirable to go back as far as July, or even January, 1936, in order to obtain a sufficiently large series to report on.

(d) The main portion of the form (Cols. 1 to 16 inclusive) has been devised with a view to minimising the amount of actual writing required. Thus, five of the columns (7, 8, 9, 10 and 15) are so headed that, if applicable to the case, all that is required to indicate this is a tick in the right column.

(e) The supplementary portion of the form is intended to be entirely optional and while it is hoped that some useful information may thus be obtained, the value of the main portion of the return will not be prejudiced if the supplementary portion is not completed. If any difficulty, therefore, is experienced in supplying the supplementary information this portion of the return should be ignored.

(f) The remarks column may serve to throw light on some fact recorded in the main portion of the return which might otherwise tend to be obscure. It should also be used for indicating cases which are still under treatment at date of report. (See note 16 below.)

2. *Serial Number of Case.* (Col. 1.)

If the cases are reported on in strict sequence according to the date of their first attendance the figures shown in this column will correspond with the chronological order of their reception. It is not essential that they should be recorded in chronological order and there would be no objection to particular types of fractures being recorded on separate sheets, if desired, but spaces are provided for recording 25 cases on each sheet of the inquiry form and this number should be adhered to, if possible, in order to simplify the subsequent tabulation.

3. Identification Number or Other Symbol. (Col. 2.)

The purpose of this information is to facilitate reference to the case should any question arise in connection with some possible ambiguity in the return during the course of tabulation. In lieu of an identification number the patient's initials may be given if the Surgeon sees no objection to doing so.

4. Pre-accident Occupation. (Col. 5.)

(a) The term "occupation" is here used exclusively in the sense of means of earning a livelihood, whether independently or in the service of an employer.

(b) In this sense housewives and retired persons should be regarded as having no occupation.

(c) On the other hand a person should not be regarded as having no pre-accident occupation merely because he (or she) happened to be unemployed.

(d) The information desired can be given by simply inserting "YES" in Col. 5 if the answer to the question is in the affirmative or "NO" if in the negative, but a housewife *having no other occupation* should be indicated by the letters "HW."

5. Classification of Fracture. (Col. 6.)

(a) The present investigation is limited to the results of treatment of the particular fractures specified in the accompanying schedule. The latter is not intended to be a comprehensive list of fractures but one which is representative of some of the commoner fractures.

(b) Fractures which do not strictly conform to the description of those classified in the Schedule should be excluded from the return.

(c) In filling up the return it will be sufficient to indicate the class of fracture by inserting in Col. 6 the reference number to the fracture as listed in the Schedule, e.g., the figure "8" would indicate "fracture of the shaft of the humerus."

6. Type of Case. (Cols. 7 to 10 inclusive.)

The presence or absence of complications should be indicated by marking a tick under one or more of the appropriate headings as shown below.

Type of Case.		Columns.			
		(7)	(8)	(9)	(10)
Single Fracture. (See notes 7(a) and (d) below.)					
(a) Without other severe injuries, e.g., to the soft parts, viscera, spinal cord or nerves	simple	✓	.....	.....	.....
	compound	.....	✓	.....	.....
(b) Associated with other severe injuries such as the above	simple	.....	.....	.....	✓
	compound	.....	✓	.....	✓
Multiple Fractures. (See notes 7(a), (b), (c), (d) and (e) below.)					
(a) Without other severe injuries, e.g., to the soft parts, viscera, spinal cord or nerves	simple	.....	.....	✓	.....
	compound	.....	✓	✓	.....
(b) Associated with other severe injuries such as the above	simple	.....	.....	✓	✓
	compound	.....	✓	✓	✓

7. Multiple Fractures. (Col. 9.)

(a) The term "multiple fractures" is intended to relate only to fractures of two or more limbs, or major segments of the same limb, or to fracture of a limb plus fracture of the spine or cranium or pelvis. Fractures of two contiguous bones, e.g., the radius and ulna of the same limb segment are therefore to be classed as a single fracture.

(b) In the case of a patient with multiple fractures, as thus defined, the one which was the last to be restored to its normal function, i.e., the one which continued to cause incapacity and require treatment for the longest period, should be recorded as the "principal fracture" for the purpose of classification (though not necessarily the most severe at the time of accident), all the other fractures in this patient being regarded merely as complications.

(c) Cases of multiple fractures as thus defined will, therefore, be recorded in the return by noting the "principal fracture" in Col. 6 and marking a tick in Col. 9.

(d) For the purposes of this inquiry the hand and foot are each regarded as constituting a major segment of the limb concerned. Fractures of the phalanges plus the metacarpals (or metatarsals) would, therefore, be recorded as a single (not a multiple) fracture, but both should be recorded in Col. 6, e.g., "1 + 2" or "11 + 12."

(e) Where two or more phalanges or metacarpals (or metatarsals) were fractured, the number fractured may be indicated in brackets after the List Number in Col. 6. Thus, "2 (3)" would indicate the fracture of three metacarpal bones.

8. *Fractures associated with other severe injuries.* (Col. 10.)

(a) In cases complicated by severe injuries to the soft parts or viscera, or to the spinal cord or nerves, the fact should be indicated by marking a tick in Col. 10 whether or not the case has already been noted as a case of multiple fractures in Col. 9. (The presence of paraplegia should be indicated by adding the letter "P" to the tick in Col. 10.)

(b) It is unlikely that it will be found possible to make any statistical use of the information supplied regarding such cases, but it is felt that it would be desirable to know the proportion of such cases which occur among a consecutive series.

9. *Date of Injury.* (Col. 11.)

(a) Cases partly treated elsewhere than in the Fracture Department or by the Surgeon in charge thereof should be excluded from the return. This applies to any treatment of the fracture, other than that of a purely temporary or provisional character of the nature of First Aid, whether by a member of the hospital staff not attached to the Fracture Department or by an outside practitioner.

(b) It has been thought inadvisable to limit the return to cases seen within a definite period of time after the injury, but the Remarks Column of the form is available for calling attention, if desired, to any exceptional circumstances prejudicial to the successful treatment of a particular case.

10. *Date when Treatment was discontinued.* (Cols. 12, 13 and 14.)

(a) The term "treatment" is here used to include any form of rehabilitation (in the sense of reconditioning by means of remedial exercises, etc.) prescribed by the Surgeon in charge of the Fracture Department and provided at or in connection with that Department.

(b) If for any reason, other than death, the patient ceased to attend before the Surgeon had decided to discontinue treatment the case should be omitted from the return.

(c) It is assumed that, generally speaking, treatment is not finally discontinued until function is as fully restored as possible; the fact that a patient may have resumed work before this stage was reached is immaterial to the purposes of this inquiry.

(d) In certain cases, however, treatment may be purposely discontinued before function is fully restored in the belief that the remaining loss of function will be completely recovered without further treatment, i.e., by the normal use of the limb, and provision has been made for recording such cases in Col. 13.

(e) It should be emphasised that there is no intention of comparing periods of disability shown in the returns supplied by the various Surgeons co-operating in this inquiry and secondly, that *it is not the desire of the Committee to minimise in any way the periods of disability* attaching to the various types of fractures when treated at organised Fracture Departments. Any inclination to understate the length of treatment required should, therefore, be strictly avoided and in cases of doubt it would be better that the return should not err on the side of understatement of the length of treatment required.

11. *Function Fully Restored.* (Col. 12.)

The term "function fully restored" for the purposes of this inquiry is intended to mean that by ordinary objective *clinical* tests the function appeared to the Surgeon to be fully restored. In other words, it is intended to imply a reasonable assessment of the patient's capacity for work as judged by a medical man at the time when treatment was discontinued as having achieved its optimum results.

12. *Function Totally and Irretrievably Lost.* (Col. 15.)

(a) In such cases it is unnecessary to inquire as to the duration of treatment or the date it was discontinued and it will be sufficient to record the result by marking a tick in Col. 15.

(b) The method of dealing with the case of a patient who has died will depend on whether death occurred during the course of treatment or before fracture treatment proper (other than First Aid) was commenced. In the latter event the case should be omitted entirely from the return, since it cannot be said to have been treated by the Fracture Department. In the event of death having occurred during actual treatment of the fracture, the fact of death should be recorded in Col. 15 by the letter "D."

(c) A similar method should be followed in recording a case in which amputation has been performed, i.e., the fact should be recorded in Col. 15 by the letter "A."

13. *Compensation Cases.* (Col. 16.)

If the case was one in which the Surgeon became aware that the patient was claiming compensation, the fact should be recorded in Col. 16 by marking

C.W. for injuries sustained in employment.

C.R. for road injuries (if "C.W." not applicable).

C.O. for others.

Col. 16 should be left blank if the case is not known to be a compensation case.

14. *Duration of In-patient Treatment.* (Cols. 17 and 18.)

In the case of a patient transferred from one in-patient department to another of the same hospital or to an auxiliary institution attached to the same hospital, the whole period of in-patient treatment should be included, provided it was directed throughout by the Surgeon in charge of the Fracture Department (see also note 9 (a) above).

15. *Duration of Out-patient Treatment.* (Cols. 19 and 20.)

Out-patient treatment should be regarded as including any treatment as an out-patient prescribed by the Surgeon in charge of the Fracture Department whether such treatment was carried out under his immediate supervision, or under his general supervision in an independent massage or physio-therapeutic department attached to the same hospital, provided he was responsible for deciding the nature and duration of treatment required.

16. *Cases still under Treatment at Date of Report.* (Col. 21.)

Such cases, if any, should not be excluded from the return on account of this fact, alone. In such cases Cols. 12 to 20, inclusive, may be left blank, but a note should be made in Col. 21, e.g. "Still attending" or "Still in hosp."

SCHEDULE OF FRACTURES.

Upper Limb.

1. One or more phalanges.
2. One or more metacarpals.
3. Scaphoid of the wrist.
4. Lower end of the radius, into or indirectly involving the wrist joint, with or without fracture of the ulna (including "Colles" and "Smith's").
5. Shafts of *both* radius and ulna.
6. Radius or ulna, into or indirectly involving the elbow joint:
 - (a) Upper end of radius.
 - (b) Olecranon.
7. Lower end of humerus:
 - (a) Into elbow joint.
 - (b) Supracondylar.
8. Shaft of humerus.
9. Upper end of humerus (excluding fracture-dislocation of the shoulder joint).
10. Clavicle.

Lower Limb.

11. One or more phalanges.
12. One or more metatarsals.
13. Astragalus.
14. Os Calcis.
15. Fractures into or indirectly involving the ankle joint:
 - (a) Malleolar fractures, with displacement of the ankle joint.
 - (b) Malleolar fractures without displacement of the ankle joint.
16. Shafts of *both* tibia and fibula.
17. Tibia, into or indirectly involving the knee joint.
18. Patella.
19. Femur, into or indirectly involving the knee joint.
20. Shaft of femur.

Spine.

21. One or more bodies of vertebrae (simple compression).
22. One or more bodies of vertebrae (with dislocation).

Note.—The co-existence of fractures "6" and "7" in the list would constitute the case one of "multiple fractures" according to the principle set out in the note 7 on the back of the Inquiry Form, but the co-existence of fractures "1" and "2", or of "11" and "12" would not do so. (See note 7 (d)).

THE INCIDENCE OF COMPLICATIONS AMONG THE 6,364 CASES REPORTED ON.

Analysis in respect of the presence or absence of complications.		Analysis of the 571 cases with one or more complications present.				
List No.	Schedule of Fractures.	Total number of cases.	Straight-forward cases of simple fracture without complications.	Cases with one or more complications.	Cases of compound fracture.	Cases with a combination of two or more of the foregoing complications.
	Classification (short title).					
1	Phalanges of hand (one or more) ...	500	353	147	136	6
2	Metacarpals (one or more) ...	427	402	25	14	6
3	Scaphoid of wrist ...	153	139	14	14	0
4	Radius (lower end) ...	1,592	1,544	48	8	1
5	Radius and Ulna (shaft) ...	515	496	19	12	2
6(A)	Radius (upper end) ...	230	212	18	10	0
6(B)	Olecranon ...	71	66	5	3	0
7(A)	Humerus (into elbow joint) ...	117	108	9	2	3
7(B)	Humerus (supracondylar) ...	218	203	15	1	1
8	Humerus (shaft) ...	93	78	15	3	2
9	Humerus (upper end) ...	219	211	8	1	0
10	Clavicle ...	377	355	22	1	1
11	Phalanges of foot (one or more) ...	286	238	48	46	0
12	Metatarsals (one or more) ...	300	286	14	7	1
13	Astragalus ...	7	5	2	1	0
14	Os Calcis ...	75	63	12	1	0
15(A)	Ankle (with displacement) ...	209	193	16	9	2
15(B)	Ankle (without displacement) ...	408	394	14	9	0
16	Tibia and Fibula (shafts) ...	303	226	77	51	12
17	Tibia (into knee joint) ...	37	34	3	2	0
18	Patella ...	43	42	1	0	1
19	Femur (into knee joint) ...	8	5	3	1	0
20	Femur (shaft) ...	111	91	20	3	4
21	Vertebral bodies (simple compression) ...	60	47	13	1	2
22	Vertebral bodies (with dislocation) ...	5	2	3	0	0
Totals ...		6,364	5,793	571	309	44
					135	83

TABLE III.

THE PROPORTION OF CASES OF THE VARIOUS CLASSES OF FRACTURE IN WHICH A DELAY OCCURRED BETWEEN THE DATE OF INJURY AND DATE OF FIRST ATTENDANCE.

Schedule of Fractures.		Total number of cases attending.†	First attendance (or admission).		Days.							Number of cases in which the period of delay (without treatment) between the date of injury and that of first attendance at the Fracture Department was as shown below :—		
List No.	Classification (short title).		On day of injury.	At some later date.†	1-2	3-7	8-14	15-21	22-28	Over 28				
1	Phalanges of hand (one or more) ...	455	316	139	% 66 14·5	% 47 10·3	% 19 4·2	3	2	2	2			
2	Metacarpals (one or more) ...	392	220	172	94 24·0	50 12·8	22 5·6	3	2	2	1			
3	Scaphoid of wrist ...	140	67	73	52 37·1	11 7·9	3 2·1	2	1	1	4			
4	Radius (lower end) ...	1,419	924	495	304 21·4	161 11·3	22 1·5	4	1	1	3			
5	Radius and Ulna (shafts) ...	456	339	117	69 15·1	40 8·8	7 1·5	0	1	1	0			
6(A)	Radius (upper end) ...	200	113	87	53 26·5	28 14·0	5 2·5	1	0	0	0			
6(B)	Olecranon ...	63	40	23	13 20·6	6 9·5	1 1·6	2	0	0	1			
7(A)	Humerus (into elbow joint) ...	110	78	32	22 20·0	9 8·2	1 0·9	0	0	0	0			
7(B)	Humerus (supracondylar) ...	186	125	61	42 22·6	17 9·1	2 1·1	0	0	0	0			
8	Humerus (shaft) ...	82	60	22	12 14·6	8 9·8	2 2·4	0	0	0	0			
9	Humerus (upper end) ...	196	116	80	55 28·1	19 9·7	4 2·0	0	0	2	2			
10	Clavicle ...	355	234	121	68 19·2	43 12·1	10 2·8	0	0	0	0			
11	Phalanges of foot (one or more) ...	282	186	96	58 20·6	28 9·9	6 2·1	2	0	2	2			
12	Metatarsals (one or more) ...	257	154	103	37 14·4	35 13·5	21 8·2	4	3	3	3			
13	Astragalus ...	7	6	1	1 14·3	0 —	0 —	0	0	0	0			
14	Os Calcis ...	69	42	27	12 17·4	10 14·5	2 2·9	2	1	1	0			

15(A)	Ankle (with displacement)...	...	179	147	32	21	11.7	6	3.4	4	2.2	1	0
15(B)	Ankle (without displacement)	...	341	207	134	77	22.6	39	11.4	12	3.5	3	1
16	Tibia and Fibula (shafts) ...	...	261	245	16	11	4.2	3	1.1	2	0.8	0	0
17	Tibia (into knee joint) ...	...	32	20	12	6	18.7	3	9.4	2	6.2	1	0
18	Patella ...	...	41	26	15	9	21.9	3	7.3	1	2.4	1	1
19	Femur (into knee joint) ...	...	8	6	2	1	12.5	1	12.5	0	—	0	0
20	Femur (shaft) ...	...	97	94	3	2	2.1	1	1.0	0	—	0	0
21	Vertebral bodies (simple compression)	...	46	40	6	2	4.3	1	2.1	0	—	1	1
22	Vertebral bodies (with dislocation)	...	5	3	2	1	20.0	1	20.0	0	—	0	0
	Totals ...	...	5,679	3,808	1,871	1,088	19.2	570	10.0	148	2.6	30	21

† Excluding 685 cases in which the exact interval between date of injury and first attendance was not recorded.

TABLE IV.
IN-PATIENT TREATMENT PROVIDED AT 13 FRACTURE DEPARTMENTS IN CASES OF FRACTURES
OF THE UPPER AND LOWER LIMBS.

Schedule of Fractures.		Number of cases reported.	Number treated as In-patients.	Average number of days in hospital.
List No.	Classification.			
<i>Upper Limb.</i>				
1	Phalanges of hand (one or more)	1,015	43	17
2	Metacarpals (one or more)			
3	Scaphoid of wrist			
4	Radius (lower end)	1,472	24	9
5	Radius and Ulna (shafts)	495	37	7
6(A)	Radius (upper end)	267	26	11
6(B)	Olecranon			
7(A)	Humerus (into elbow joint)			
7(B)	Humerus (supracondylar)	317	51	9
8	Humerus (shaft)	83	24	19
9	Humerus (upper end)	196	21	20
10	Clavicle	349	18	12
Totals—Upper Limb		4,194	244	12

<i>Lower Limb.</i>					
I I	Phalanges of foot (one or more)	...	...	...	17
I 2	Metatarsals (one or more)	...	...	27	16
I 3	Astragalus ...	...	...	31	11
I 4	Os Calcis ...	...	...	107	20
I 5(A)	Ankle (with displacement)	...	...	160	11
I 5(B)	Ankle (without displacement)	...	...	20	21
I 6	Tibia and Fibula (shafts)	...	...	23	40
I 7	Tibia (into knee joint) ...	...	...	6	48
I 8	Patella ...	...	...	94	
I 9	Femur (into knee joint) ...	...	...
20	Femur (shaft) ...	...	...
	Totals—Lower Limb ...	...	1,666	468	23
	Totals—All cases ...	...	5,860	712	19

TABLE V.
DURATION AND RESULTS OF TREATMENT IN CASES OF "SIMPLE FRACTURE" WITHOUT
COMPLICATIONS.*

Straightforward cases of "simple fracture " without complications.		Total number in which treatment completed.	The number of such cases in which the treatment was discontinued because, in the opinion of the Surgeon :							
Schedule of Fractures.			"Function was fully restored."		"Complete recovery was expected without further treatment."		"A state of permanent partial loss of function was stabilised."		"Function totally and irretrievably lost."	
List No.	Classification (Short Title).		Number of cases.	Average duration of treatment (days).	Number of cases.	Average duration of treatment (days).	Number of cases.	Average duration of treatment (days).		
1	Phalanges of hand (one or more)	353	237	39	99	36	17	80	0	
2	Metacarpals (one or more)	402	302	37	91	34	9	71	0	
3	Scaphoid of wrist	139	94	75	36	77	9	188	0	
4	Radius (lower end)	1,544	1,062	53	391	46	91	75	0	
5	Radius and Ulna (shafts)	495	400	63	83	55	12	130	0	
6(A)	Radius (upper end)	212	118	57	69	71	24	143	1	
6(B)	Olecranon	66	43	64	18	60	5	232	0	
7(A)	Humerus (into elbow joint)	106	67	64	28	68	13	174	0	
7(B)	Humerus (supracondylar)	203	129	64	63	49	11	107	0	
8	Humerus (shaft)	78	47	79	26	72	4	163	1	
9	Humerus (upper end)	211	112	68	51	55	48	100	0	
10	Clavicle ...	355	309	34	45	31	1	47	0	
11	Phalanges of foot (one or more)	238	192	31	45	22	1	12	0	
12	Metatarsals (one or more)	286	221	51	62	42	3	176	0	
13	Astragalus	5	3	77	1	31	1	246	0	
14	Os Calcis	63	34	163	17	103	12	260	0	
15(A)	Ankle (with displacement)	193	122	106	46	91	25	187	0	
15(B)	Ankle (without displacement)	394	304	66	89	62	1	352	0	

16	Tibia and Fibula (shafts)	...	...	226	160	116	55	111	10	257	1
17	Tibia (into knee joint) ...	...	...	34	18	90	6	106	10	174	0
18	Patella ...	...	...	42	24	95	13	113	5	253	0
19	Femur (into knee joint)	...	...	5	3	87	2	323	0	—	0
20	Femur (shaft) ...	...	...	90	62	135	18	150	9	274	1
21	Vertebral bodies (simple compression)	...	...	47	25	223	10	162	12	253	0
22	Vertebral bodies (with dislocation) ...	...	...	2	2	153	0	—	0	—	0
	Totals	...	...	5,791	4,090	—	1,364	—	333	—	4

* Three cases of "simple fracture" without complications which were still under treatment at date of report are, of course excluded from this Table.

TABLE VI.
DURATION AND RESULTS OF TREATMENT IN CASES OF FRACTURE WITH ONE OR MORE
COMPLICATIONS.*

Cases of fracture with one or more complications present.		Total number in which treatment completed.	The number of such cases in which the treatment was discontinued because, in the opinion of the Surgeon :							
List No.	Schedule of Fractures.		"Function was fully restored."		"Complete recovery was expected without further treatment."		"A state of permanent partial loss of function was stabilised."		"Function totally and irretrievably lost."	
			Number of cases.	Average duration of treatment (days).	Number of cases.	Average duration of treatment (days).	Number of cases.	Average duration of treatment (days).		
1	Phalanges of hand (one or more)	147	74	50	39	45	26	132	8	
2	Metacarpals (one or more)	25	10	75	7	53	5	126	3	
3	Scaphoid of wrist	14	9	160	2	84	3	175	0	
4	Radius (lower end)	48	23	77	16	64	9	119	0	
5	Radius and Ulna (shafts)	18	9	79	0	—	7	238	2	
6(A)	Radius (upper end)	18	10	56	3	81	4	258	1	
6(B)	Olecranon	5	1	129	2	74	2	152	0	
7(A)	Humerus (into elbow joint)	9	2	115	1	61	6	155	0	
7(B)	Humerus (supracondylar)	14	6	127	6	105	2	356	0	
8	Humerus (shaft)	15	12	106	0	—	3	204	0	
9	Humerus (upper end)	8	4	84	2	68	2	175	0	
10	Clavicle	22	15	68	5	40	1	320	1	
11	Phalanges of foot (one or more)	48	32	35	12	61	2	128	2	
12	Metatarsals (one or more)	14	9	85	2	67	3	322	0	
13	Astragalus	2	0	—	1	67	1	179	0	
14	Os Calcis	11	5	216	3	134	3	227	0	
15(A)	Ankle (with displacement)	16	7	173	4	80	3	350	2	

15(B)	Ankle (without displacement)	...	14	8	89	3	84	3	179	0
16	Tibia and Fibula (shafts)	...	74	40	207	8	216	15	259	11
17	Tibia (into knee joint)	...	3	1	62	0	—	2	310	0
18	Patella ...	...	1	0	—	0	—	1	345	0
19	Femur (into knee joint)	...	3	1	168	0	—	2	403	0
20	Femur (shaft) ...	...	18	8	192	2	194	7	315	1
21	Vertebral bodies (simple compression)	...	12	4	165	0	—	6	252	2
22	Vertebral bodies (with dislocation)	...	3	0	—	0	—	1	314	2
	Totals	...	562	290	—	118	—	119	—	35

* Ten cases of fracture, with one or more complications, which were still under treatment at date of report are, of course, excluded from this Table.

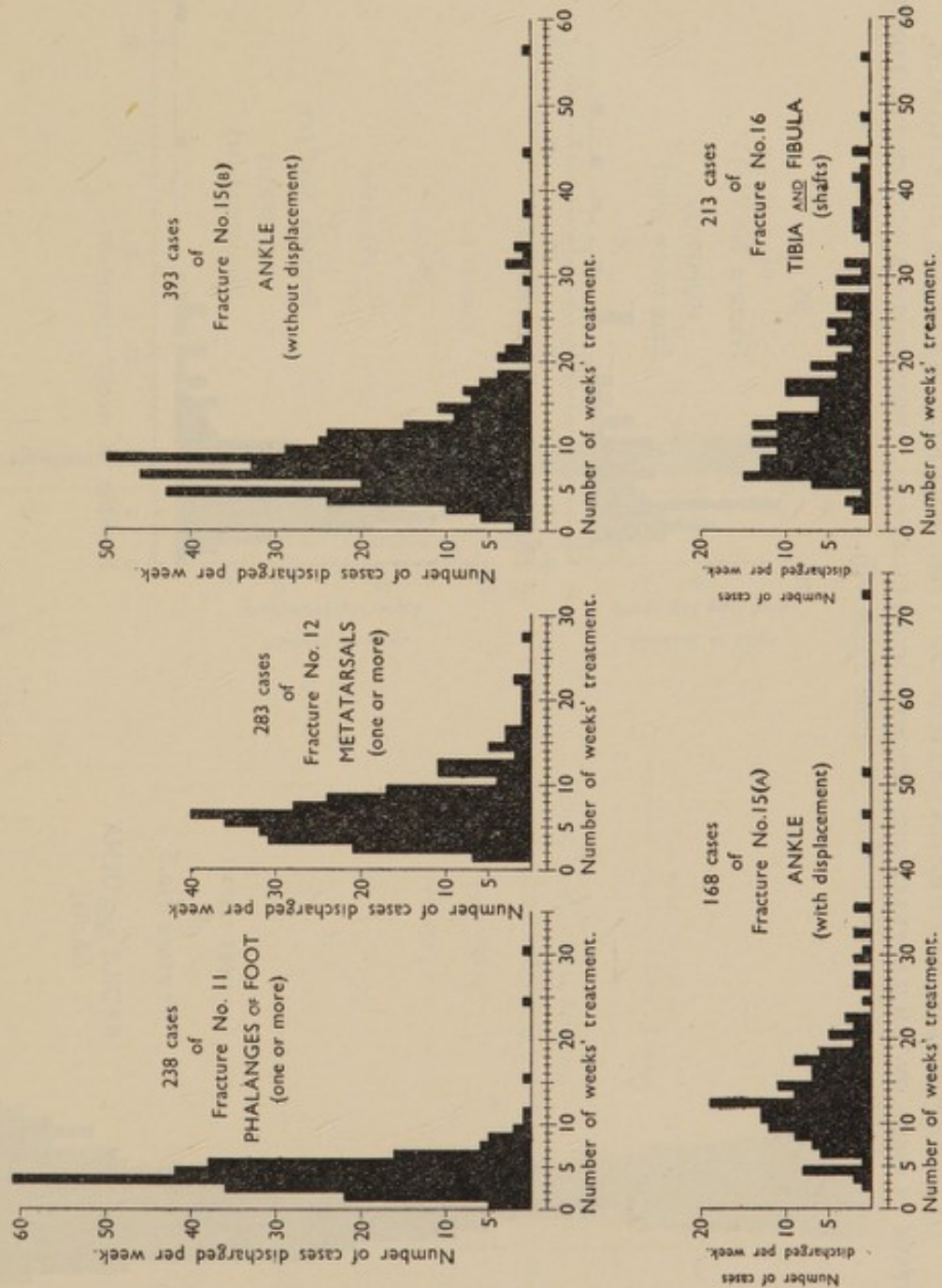
TABLE VII.

ANALYSIS OF THE DURATION OF TREATMENT IN 5080 UNCOMPLICATED CASES OF CERTAIN CLASSES OF FRACTURES.

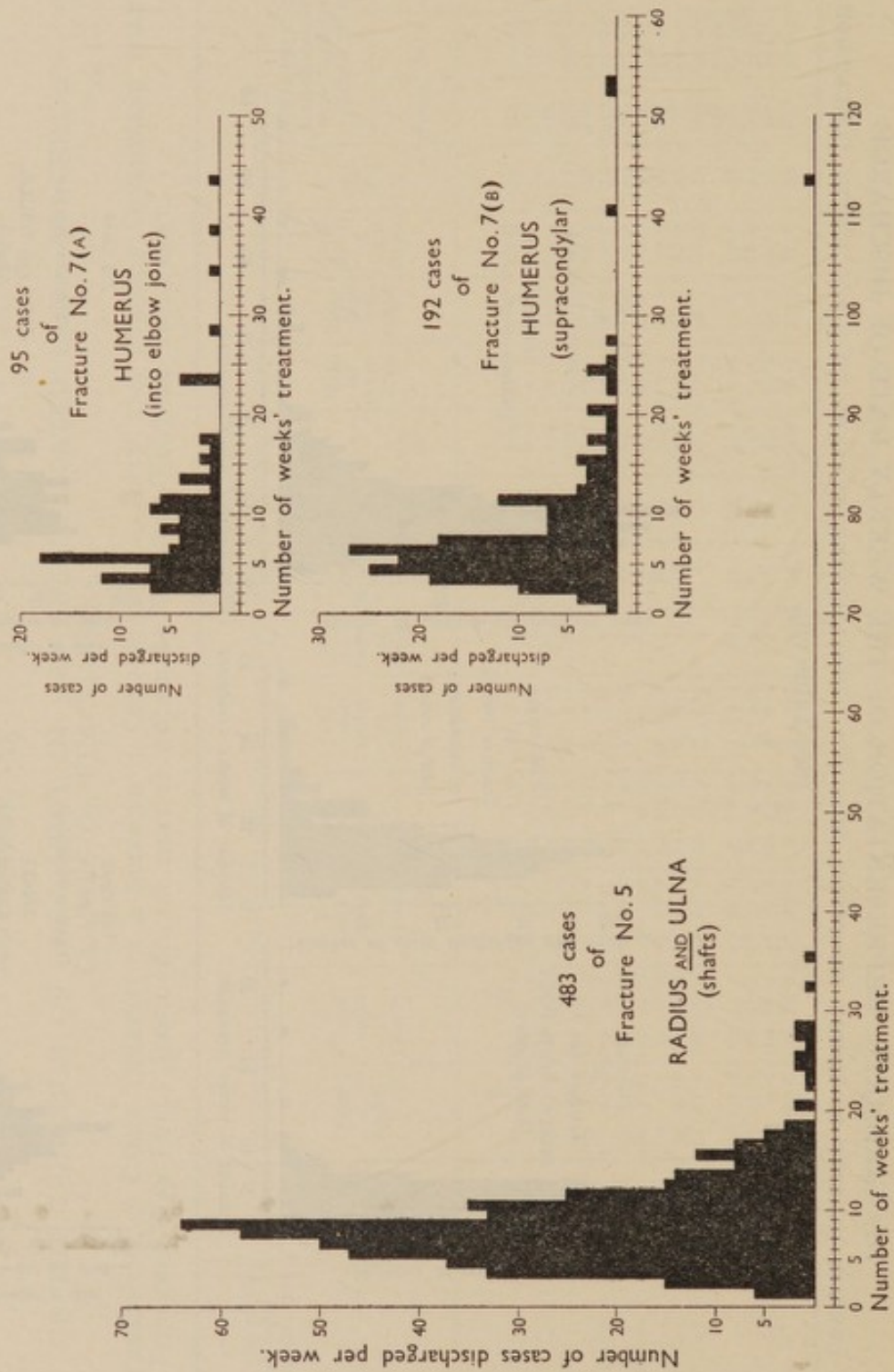
DURATION OF TREATMENT IN CASES TREATED TO A SUCCESSFUL CONCLUSION, *i.e.* UNTIL THE SURGEON CONSIDERED THAT FUNCTION WAS FULLY RESTORED, OR THAT IT WOULD BE WITHOUT FURTHER TREATMENT.

The 15 classes of fractures which yielded the largest number of uncomplicated cases of simple fracture treated to a successful conclusion.		Total number of cases treated to a successful conclusion.	Duration of Treatment.										The interval in which the largest number of cases were discharged on completion of treatment.						
List No.	Classification (Short Title).		Under 4 weeks.	4 and under 8 weeks.	8 and under 12 weeks.	12 and under 16 weeks.	16 and under 20 weeks.	20 and under 24 weeks.	Over 24 weeks.	Range (days)		Mean (or Average).	Standard Deviation.	Coefficient of Variation.	Median.	Week, Days, Cases, Per cent. of total.			
										Short-est.	Long-est.								
4	Radius (lower end) ...	1,453	253 17.4	711 48.9	353 24.2	87 5.9	29 1.9	9	11	7	423	51.9	31.4	60.3	45	7th	42-48	197	13.5
5	Radius and ulna (shafts) ...	483	54 11.2	191 39.5	157 32.5	49 10.1	16 3.3	4	12	9	798	59.8	46.9	78.4	55	9th	56-62	64	13.2
2	Metacarpals (one or more) ...	393	131 33.3	221 56.2	29 7.3	7 1.7	2 0.5	—	3	2	274	37.6	23.3	62.0	31	5th	28-34	93	23.7
15(B)	Ankle (without displacement) ...	393	42 10.7	142 36.1	128 32.5	42 10.7	18 4.5	8	13	1	393	66.3	44.6	67.2	57	9th	56-62	50	12.7
10	Clavicle ...	355	165 46.5	164 46.2	14 4.0	4 1.1	3 0.8	1	4	6	301	35.1	27.2	77.5	28	4th	21-27	102	28.7
1	Phalanges of hand (one or more) ...	336	137 40.8	144 42.8	36 10.7	11 3.2	2 0.6	3	3	1	232	39.0	28.3	72.7	31	4th	21-27	67	19.9
12	Metatarsals (one or more) ...	283	59 20.8	136 48.0	56 19.8	21 7.4	6 2.1	4	1	8	192	29.8	16.9	56.7	43	7th	42-48	40	14.1
11	Phalanges of foot (one or more) ...	237	124 52.3	102 43.0	9 3.8	1 0.4	—	—	1	1	210	29.8	16.9	56.7	27	4th	21-27	61	25.7
16	Tibia and fibula (shafts) ...	213	5 2.3	36 16.9	49 23.0	37 17.3	31 14.5	15	40	14	389	113.4	69.1	60.9	91	7th	42-48	15	7.0
7(B)	Humerus (supracondylar) ...	192	34 17.7	92 47.9	33 17.1	14 7.3	6 3.1	5	8	6	371	60.6	51.0	84.2	43	7th	42-48	27	14.1
6(A)	Radius (upper end) ...	186	51 27.4	69 37.1	25 13.4	23 12.3	7 3.8	3	8	7	275	57.4	46.2	80.5	41	3rd & 5th	14-20	23	12.4
15(A)	Ankle (with displacement) ...	168	3 1.8	22 13.1	47 28.0	46 27.3	24 14.2	10	16	19	507	102.2	62.0	60.7	88	13th	84-90	19	11.3
9	Humerus (upper end) ...	163	21 12.9	78 47.8	28 17.1	16 9.8	8 4.9	2	10	3	348	64.9	51.0	78.6	45	6th	35-41	27	16.6
3	Scaphoid of wrist ...	130	6 4.6	39 30.0	45 34.6	20 15.3	9 6.9	5	6	21	284	76.9	43.9	57.1	62	7th	42-48	22	16.9
7(A)	Humerus (into elbow-joint) ...	95	19 20.0	34 35.8	23 24.2	8 8.4	3 3.1	4	4	14	304	65.3	53.0	81.2	45	6th	35-41	18	18.9

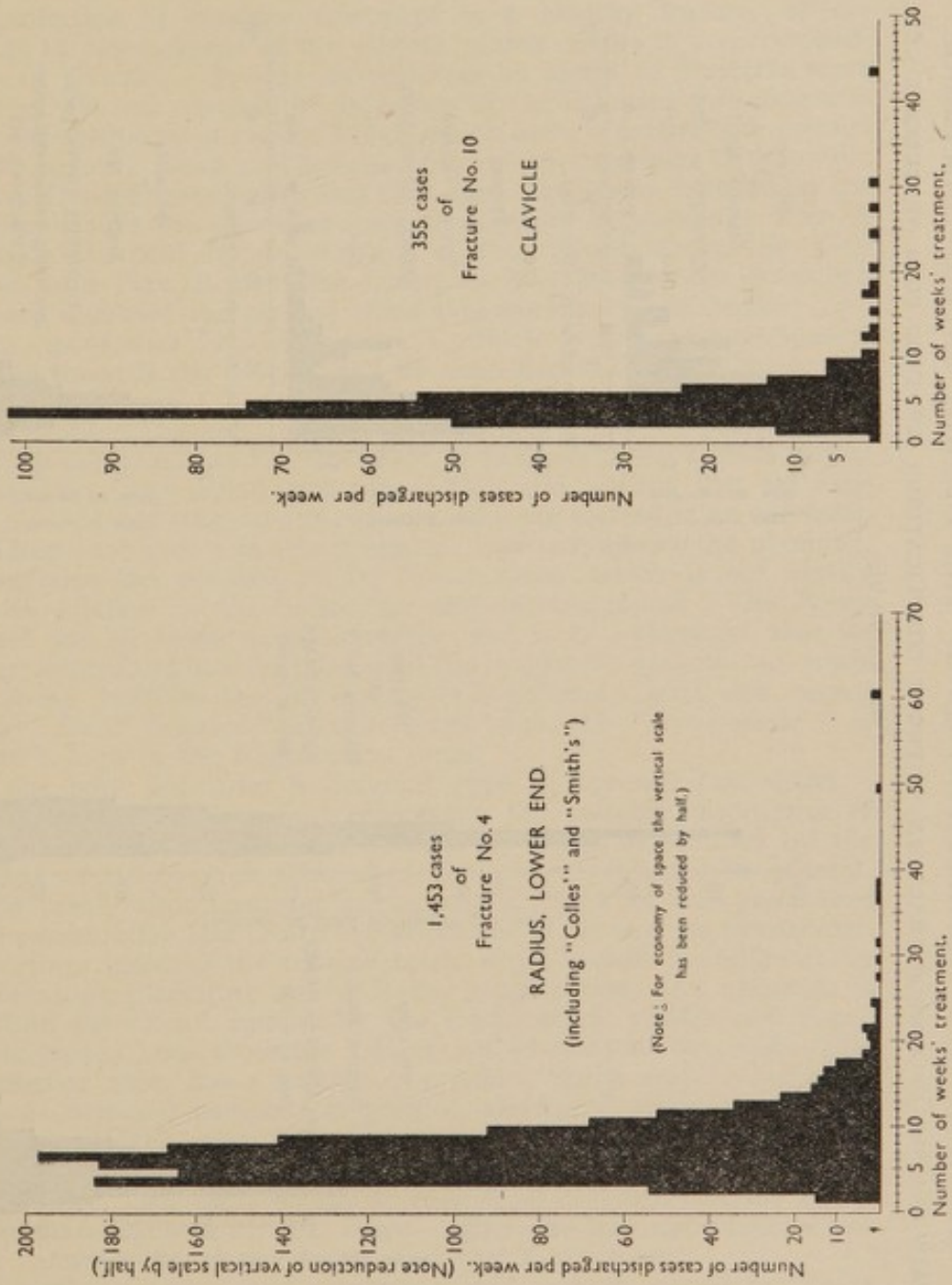
DIAGRAMMATIC REPRESENTATION OF THE WEEKLY RATE OF DISCHARGE
IN CERTAIN CLASSES OF SIMPLE FRACTURE, WITHOUT COMPLICATIONS, TREATED TO A SUCCESSFUL CONCLUSION.
(See Table vii).



DIAGRAMMATIC REPRESENTATION OF THE WEEKLY RATE OF DISCHARGE
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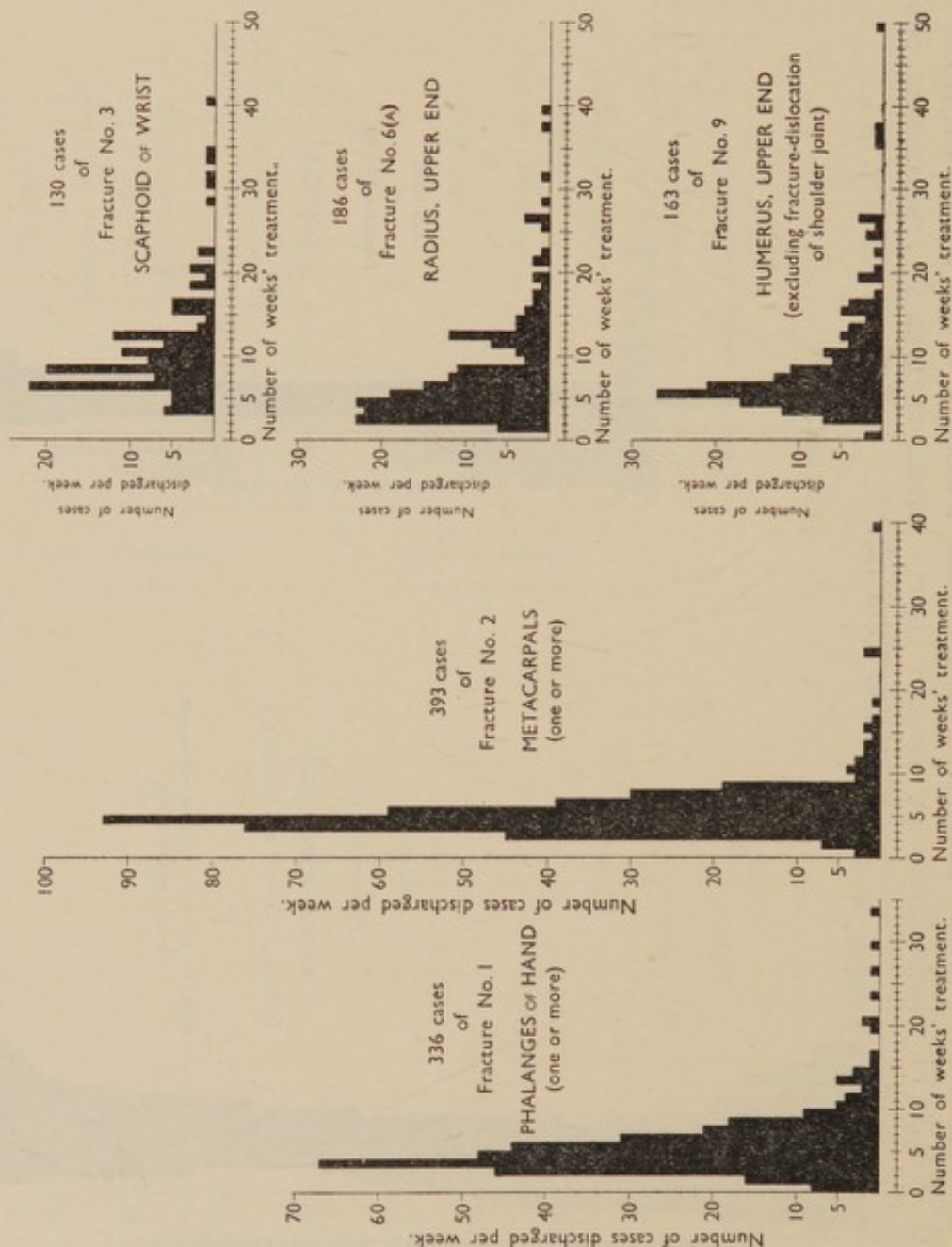
DIAGRAMMATIC REPRESENTATION OF THE WEEKLY RATE OF DISCHARGE
IN CERTAIN CLASSES OF SIMPLE FRACTURE, WITHOUT COMPLICATIONS, TREATED TO A SUCCESSFUL CONCLUSION.
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DIAGRAMMATIC REPRESENTATION OF THE WEEKLY RATE OF DISCHARGE

IN CERTAIN CLASSES OF SIMPLE FRACTURE, WITHOUT COMPLICATIONS, TREATED TO A SUCCESSFUL CONCLUSION.

(See Table vii).



APPENDIX Q.

The Out-patient Accommodation of a Fracture Department.

It is neither possible nor desirable to propose a "model" plan for a fracture out-patient department at the present time. It necessarily follows from our recommendation—that fracture departments should be established at general hospitals—that new accommodation for fractures should be incorporated in existing institutions; the detailed planning will vary in each case. Further, the diversity of opinion and practice on many points in the organisation of fracture treatment is a healthy feature, at the present stage of development of the subject, which results in a corresponding variety in planning. It may nevertheless be useful to illustrate some points of principle and practice by reference to the following two diagrams drawn from sketch-plans of two buildings which have recently been erected and are now in use. Both are designed for use as combined Orthopaedic and Fracture Departments. The fact that they have been founded in the same city emphasizes the above remarks on diversity of planning. Plan A is drawn from the Mill Road Infirmary of the Corporation of the City of Liverpool, and Plan B from the Liverpool Royal Infirmary, to which bodies we are indebted for placing these diagrams at our disposal.

It will be noted that Plan A favours a cubicle system of examination rooms, closed towards the waiting hall by flush doors, but opening on the other side on a "service" corridor, communicating with the consulting and plaster rooms. The open ends of these cubicles may be curtained, to ensure privacy and facilitate the treatment of patients of both sexes during the same session. The registration office, hall, and waiting hall are used by general medical and surgical out-patients, who are treated in an extension of this building (not shown in this diagram); this fact affects the planning, and also explains the position of the X-ray room, which is not ideally situated with relation to the consulting and plaster rooms. The X-ray room is used for all types of out-patients, and it is understood that its position was determined as being the most convenient for general use, while providing X-ray facilities for the Fracture Department with due regard to economy. The "Records" room is for storage; the "live-register" of case-dossiers is kept in the Registration room.

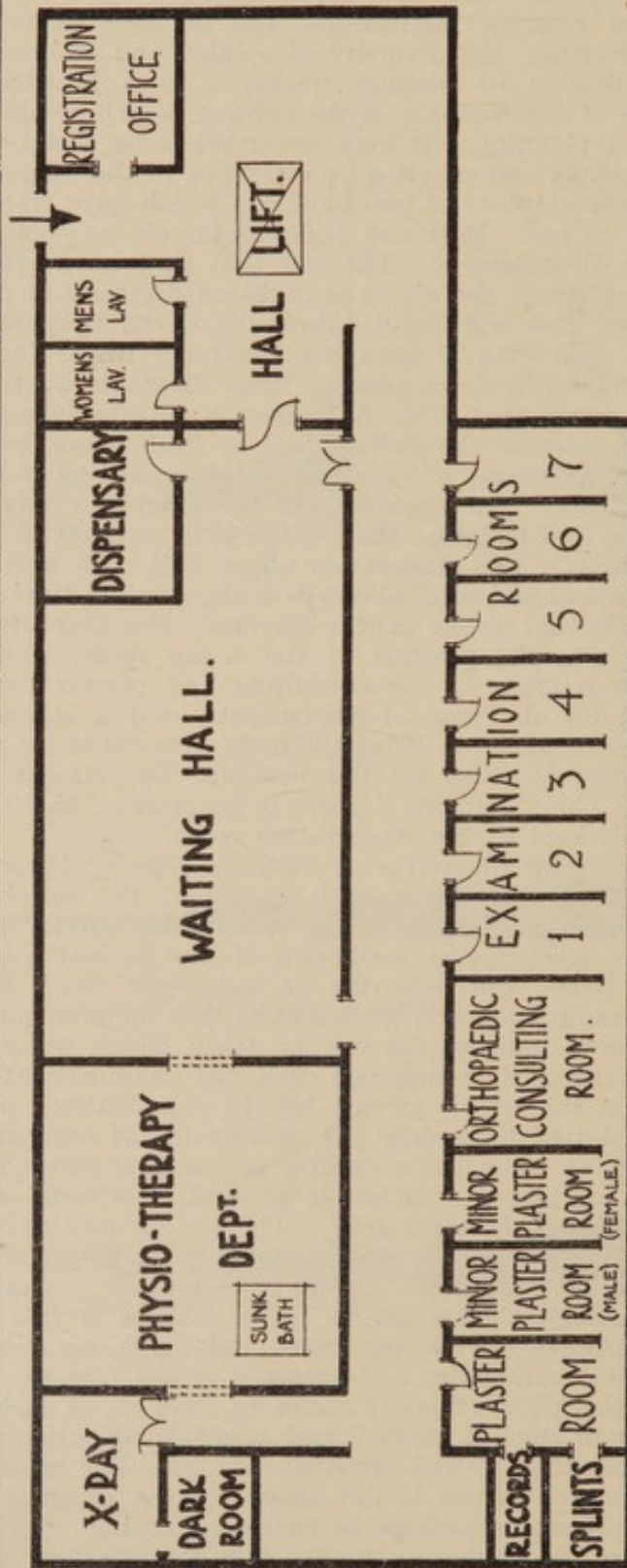
Plan B not only illustrates a different type of lay-out, but shows a number of details of fittings and equipment the suitable disposition of which will influence planning. The general lay-out is determined by the principle that efficiency is facilitated if the patient follows, in general, a prescribed route, thus ensuring an automatic check of the procedures involved in examination and treatment so that no point may be overlooked. The dark arrows indicate the routine track which would be followed by a patient requiring plastering and re-X ray examination; any variation is possible within the circuit formed by the examination, plaster and X-ray rooms. The dotted lines show the movements of some of the staff. The large examination room has a number of couches, which may be screened, and also two curtained cubicles; in general, treatment sessions would be for one sex only at the same time. There is no way out from the plaster room or the X-ray room except through the examination room, so that a patient should not "get lost" or fail to receive all proper directions before the sister-in-charge allows him to leave. There is free and direct communication between the plaster rooms and the X-ray room.

Some hospital authorities and surgeons would perhaps regard the space provided in the physio-therapy room in Plan A as rather restricted for the treatment of general medical and surgical out-patients, including fractures, by physio-therapy and remedial exercises. The extent of the massage and physio-therapy rooms is not shown in the diagram of Plan B, but the same remark would perhaps be partly applicable. Neither plan shows a room specially allocated as a gymnasium for remedial exercises.

The Almoner's office actually existing at the department to which Plan B refers is smaller than the room shown in the diagram. The usefulness of the almoner's work is stated to have made an immediate enlargement of her office desirable, and has also called for the provision of a room for the almoner's clerks, which is shown on the diagram as it is understood that it is about to be added.

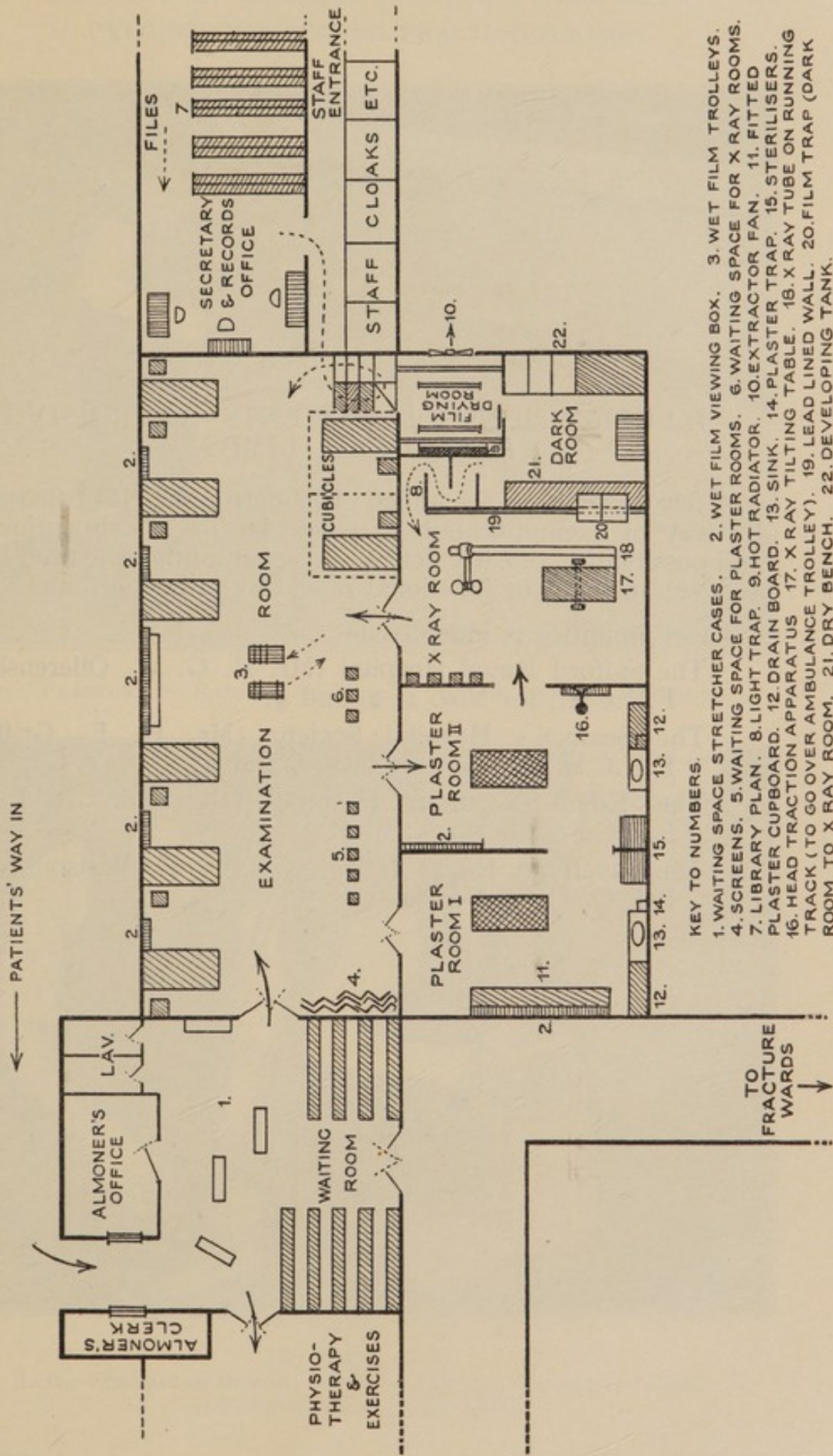
PLAN A.

FLOOR PLAN OF FRACTURE & ORTHOPAEDIC CLINIC, MILL ROAD INFIRMARY, LIVERPOOL. 6.



PLAN B.

FRACTURE AND ORTHOPAEDIC CLINIC AT LIVERPOOL ROYAL INFIRMARY.



ILLUSTRATIONS OF PATIENTS EXERCISING FRACTURED LIMBS.

A few illustrations are added of modern methods of treatment by way of exemplification in particular of (1) the principle, and possibilities, of early active movement of the fractured limb, and (2) methods of functional re-education of the limb.

The Committee is indebted to:—

The Salford Royal Hospital (Mr. R. G. W. Ollerenshaw, F.R.C.S.) for Nos. 1, 2, and 4;

The Seamen's Hospital Society (Mr. H. E. Griffiths, F.R.C.S.) for Nos. 3, 6, 7, 8 and 9;

The Royal Northern Hospital (Mr. Eric I. Lloyd, F.R.C.S.) for No. 5; and

The Liverpool Royal Infirmary (Mr. R. Watson-Jones, F.R.C.S.) for No. 10.

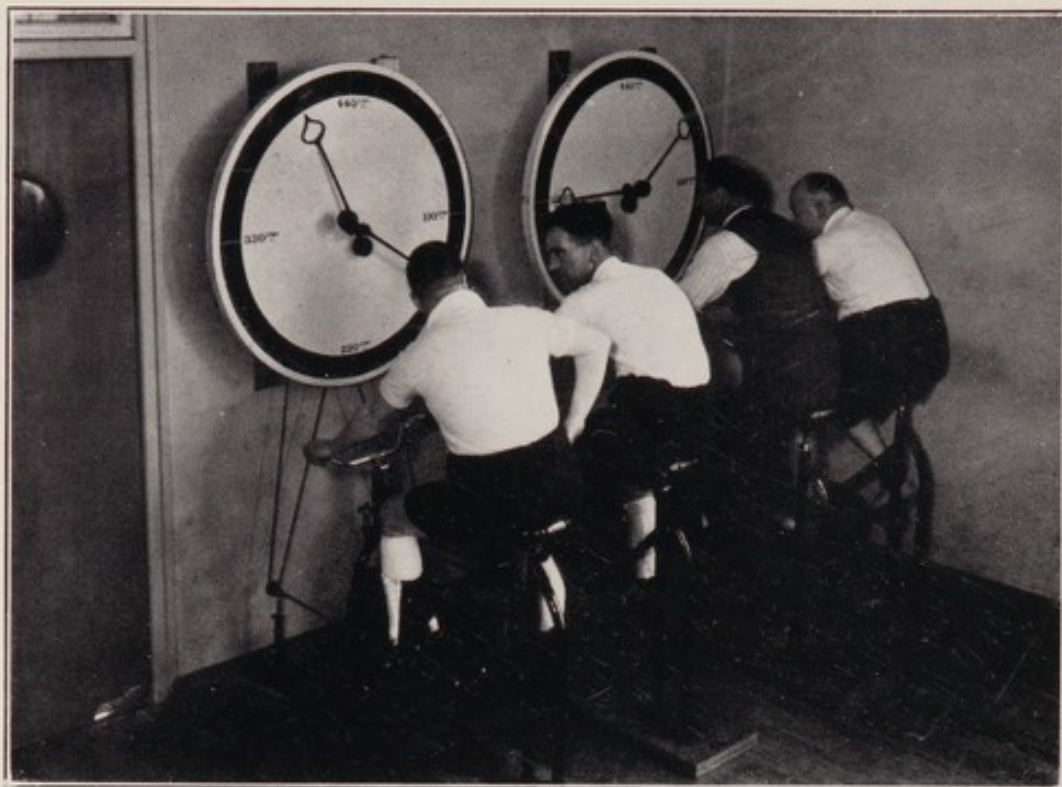
METHODS OF MODERN FRACTURE TREATMENT.
PATIENTS EXERCISING FRACTURED LIMBS.



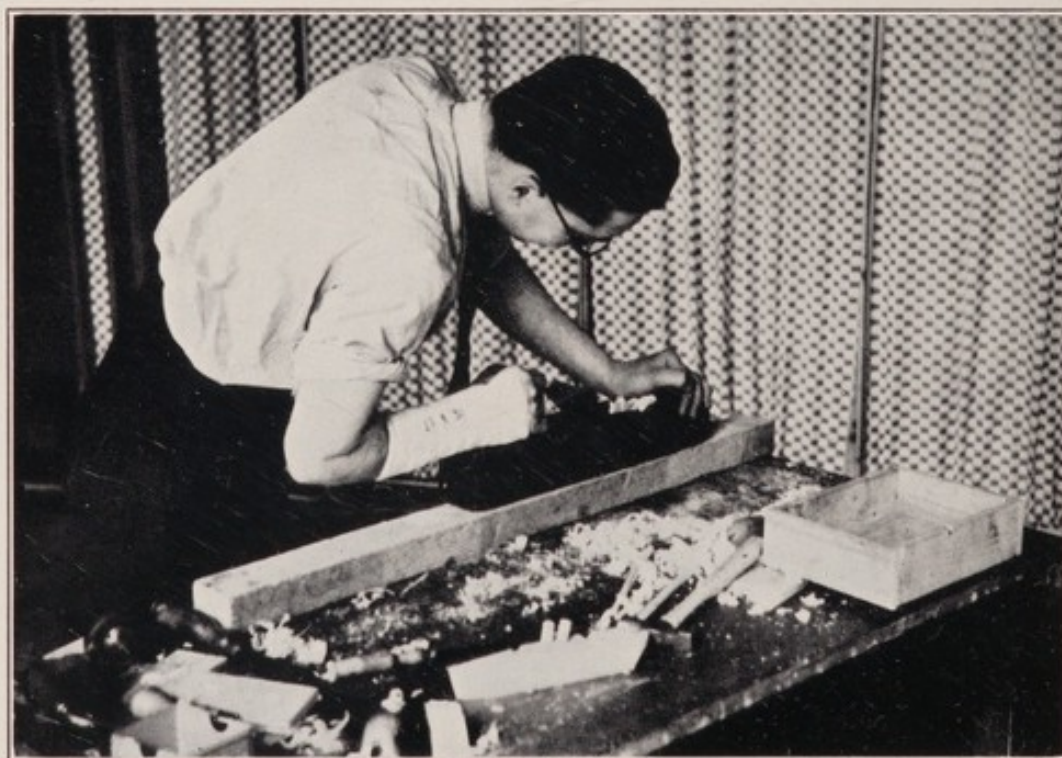
(1) FRACTURE OF RADIUS AND ULNA. (Within a few days of injury.)



(2) USING TOOLS.
Left—Fracture of thumb; right—compound fracture of radius.
(Within a few days of injury.)



(3) COMPETITIVE CYCLING FOR LEG AND ANKLE FRACTURES.



(4) USE OF PLANE FOR FRACTURE OF SCAPHOID. (Within a few days of injury.)



(5) FRACTURE OF THUMB.
A 'bus driver, who will have to use left-hand gear-change lever.
(Within first week of injury.)



(6) OVERCOMING STIFFNESS OF JOINTS AND MUSCLES IN THE LATER STAGES OF TREATMENT OF FRACTURE OF THE FEMUR.

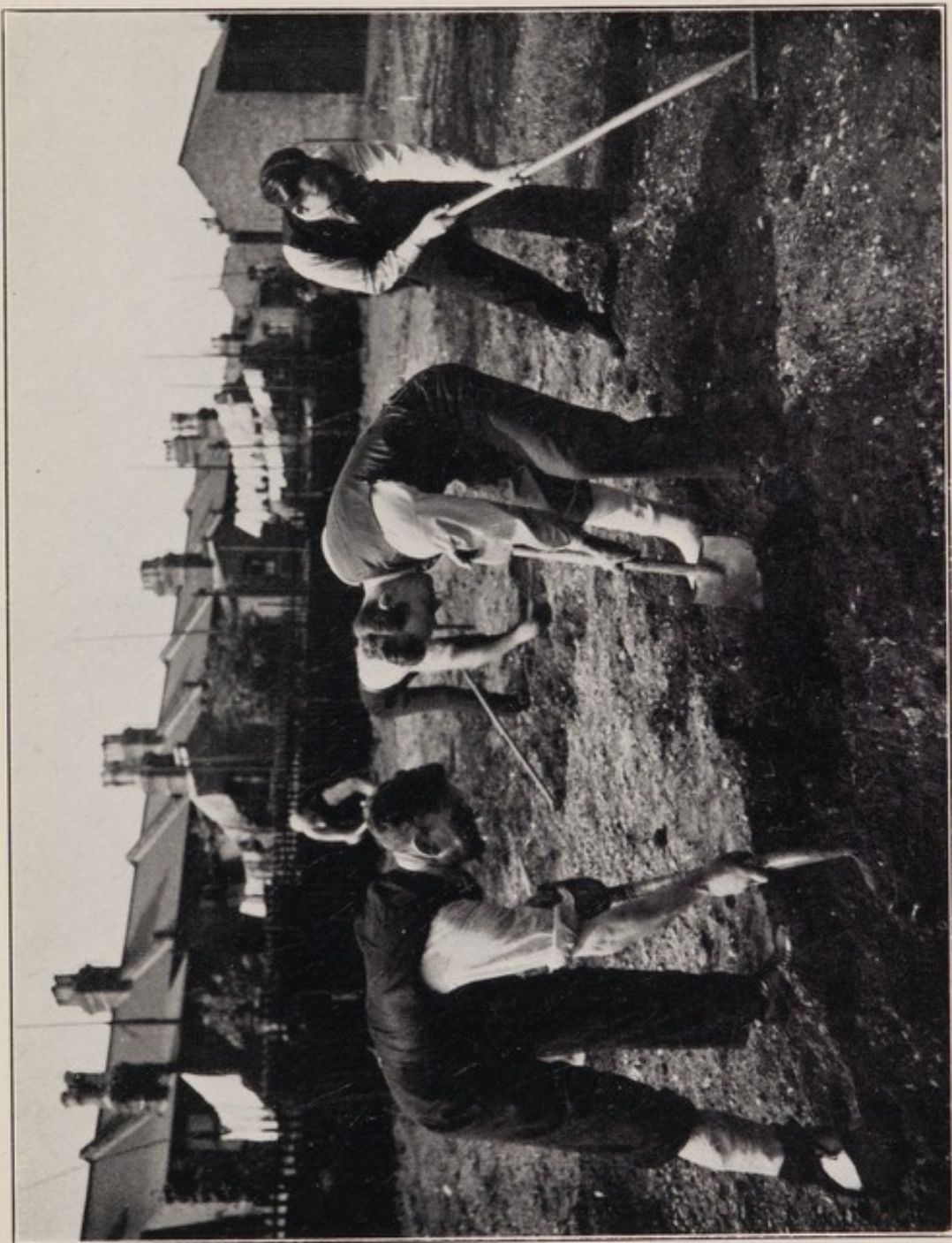


(7) USING THE FINGERS.

A fracture of the forearm, in plaster, 3 days after the injury.



(8) GENERAL VIEW OF GYMNASIUM.
Rehabilitation. Games and exercises.



(9) IN THE HOSPITAL GROUNDS.
Fractures of leg, ankle, upper arm, and spine.



(10) AT WORK AT HOME.
Fracture of the wrist immobilised in plaster.

