

# **Surgery of Repair as applied to Hand Injuries**



# SURGERY OF REPAIR AS APPLIED TO HAND INJURIES

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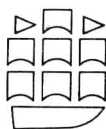
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*FOURTH EDITION*



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## FOREWORD TO THE FIRST EDITION

IT is a privilege which I greatly prize to contribute a foreword to this volume, which emanates from two distinguished Australian surgeons and which must surely be in the possession of all whose concern is with injuries of the hand. The thought comes readily to the mind how much the surgery of repair already owes to those whose cradle rocked or whose work has been wrought in lands under the Southern Cross. This work is no strange plant springing from an unknown soil tended by men lacking contact with the motherland; its roots are veritably British, for the authors have derived much of their inspiration and received training from surgeons like Gillies, McIndoe, Kilner and Rainsford Mowlem. It may therefore be reckoned a British Empire work, embodying all that has made British reparative surgery famous throughout the world as well as the special experience which has come the authors' way.

The writers are not fickle protagonists of the view that the reparative surgery of the damaged hand is the peculiar province of the plastic surgeon. This field of surgery has been a "no man's land" which has provided no compelling attraction for rival surgical specialties, but which has been gladly assigned by colleagues to those most fitted by temperament and surgical training to produce the best results. These two authors have been fortunate in the abundance and the length of their experience, which embraces injuries of the hand of industrial and war causation seen in civilian, military and repatriation hospitals, and which therefore sets an authoritative seal on this work.

True to their beliefs and notwithstanding their seniority, the authors have been ready at all times to answer the call for skilled surgical assistance in cases of hand injury *in utrumque paratus* as the Fourth Fytte of Adam Lindsay Gordon's "Ye Wearie Wayfarer" would have it, or assuming the devoted attitude of the most consummate representative of the maieutic art. By their altruistic outlook and conduct they have secured the good results described and depicted in this book.

Those whose function it is to deal with injuries of the hand will derive much profit and valuable assistance from those parts of the book drawing attention to what might be termed "a new anatomy of the hand"; it is of interest to the scholar as well as the surgeon.

In conclusion, no reader of this work can fail to realise the impact of repair-minded surgery on the progress and advance of the science and art of Surgery itself.

*Gordon Gordon-Taylor*

LONDON,  
1953.

## PREFACE TO FOURTH EDITION

TO prepare yet another edition of a text, written with a purpose timely twenty years ago, is a highly responsible task. The well-established circulation of the book, and its use by so many as a guide in this important application of surgical art, calls for delicacy on two counts: firstly, to update the text again in relation to the advancing front of surgery, both in general and in particular; secondly, not to accept as gospel much interesting activity by surgeons in this field, not yet well tried by time and application. We have no interest in any race to be the first in print with the latest—on the contrary.

In facing this task, we have the accumulation of constructive comment from far and wide, not only in formal reviews in various languages, but in the large volume of informal and friendly correspondence which this book has generated. We are grateful to all those involved. In making additions, subtractions and alterations, we have followed some of their suggestions. However, to accept others would usurp the very purpose of the book, *implicit in its title*. It is not, and never has been, meant as a full text of hand surgery. It is a record of personal experience with hand injuries as they come to us and as we practise. In some parts of the world, of course, some surgeons devote their entire professional activity to the hand, but these “hand surgeons” are relatively few. For the most part, hand surgery is done by general surgeons, orthopaedic surgeons or plastic surgeons with varying degrees of personal devotion and diversion. Long will it remain so. We are plastic surgeons, and thus the book is weighted in relation to the soft tissue problems of hand surgery wherein lies our experience. The book is our record of this. It is better for its deficiencies to be supplemented by the work of others than that we should parrot their more profound experience in particular directions. We see little of closed fractures and dislocations. These problems are well covered by our orthopaedic colleagues.

For the same reason, if the bibliography, which is related entirely to the text, is loaded in the context of plastic surgery, it does not mean that we fail to recognise the contribution of many another in this field.

Though we have seen fit to maintain a format and style which seems to have been well received, some sections have been rewritten, others elaborated and some withdrawn. In a few areas, we have retained some record of procedures which might well be considered obsolete, only to leave the experience on record. The history of surgery has a habit of turning the wheel and “rediscovering” old concepts without recognising the lessons of past experience. There is no lack of record with the latest. It is in the long term view that our literature is deficient.

Finally, while there is no end to the provision of better illustrations or their multiplication, we have kept an eye to the cost of the volume. We are proud of our publishers who still manage to produce the volume at a reasonable cost in the present-day spiral thereof.

B. K. RANK.

MELBOURNE,  
1973.

## PREFACE TO FOURTH EDITION



The hand—a universal instrument combining power with precision—the radial digital tripod subserves precision manipulation, and the two ulnar fingers augment stability and power.

## PREFACE TO FIRST EDITION

**I**NJURIES to the hand constitute a special problem for the surgeons of any modern community. Against wider horizons of modern surgical endeavour there is always a sobering thought in the high standards of structural exactitude required to subserve the many perfections of simplicity and intricacy which make up the normal functioning unit of a human hand. To contribute in some measure to the natural restoration of a hand from the unnatural effects which beset individuals to-day offers unique stimulus, scope and prize to the art of surgery and to the craft of surgeons.

The valued principles of the surgery of injury are well exemplified in their application to injured hands. Their careful application could not be more rewarded nor their disregard more conspicuous than in this particular application. Principles may not change, but neither is surgery static, for the method of application or the emphasis on principles does change.

We have set out to write a book on the surgery of hand injuries under present-day conditions, where the indications and possibilities of modern reparative surgery call for reiteration of certain principles and for realisation of higher standards of technical achievement. The prize of modern reparative surgery is often high, but so is its price, and without the precise technical knowledge and practice of how to achieve a certain end it might well often be in the patient's interest if we returned to the era of secondary closure of traumatic wounds.

We have not set out to record in familiar fashion known facts, accepted opinions and methods of treatment under various arbitrary headings to which the title might well be dissected. Our object has been to record the more fruitful developments of personal opportunity unembarrassed by consideration of alternative procedures. We realise full well that there are diverse paths to successful accomplishment, but these are generally in matters of detail or personal interpretation of values and not in matters of principle. We accept any criticism of incompleteness, believing it better to remain incomplete as a reference book than to transgress beyond the scope of first-hand experience. Nor do we see reason to reduplicate much that has been well covered by others in relation to closed injuries and fractures for our experience has been in the main with open injuries.

The work is meant primarily for the discriminative interest of those who see and treat hand injuries. With a few deliberate exceptions we have refrained from basic descriptions of elementary operative procedures which every well-trained surgeon of injury must know to-day. Our concern is rather with the correct and timely application of these procedures.

We have endeavoured to arrange the presentation in relation to injuries as they occur. Anatomical systematisation leads to hypothetical consideration of many injuries which might arise but it loses emphasis on reality.

It is frequently stated that true experience is only accumulated by personal

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trials and errors. We hope to contribute to the interest of hand mutes by some easing of this method and to the ultimate accomplishment of younger surgeons by some sparing of the timidity and uncertainty by which we have tediously developed our own standards. That surgery is not static is due, at least in some measure, to the fact that each newcomer has opportunity to start with a reduced lag in accumulated knowledge to achieve new standards.

With great respect we fully acknowledge the teaching and generously recorded experience of the men who have largely activated our own thought and practice in the sphere of hand injuries. Sir Harold Gillies, Sterling Bunnell and Sumner Koch have, indeed, been our main inspiration—Gillies, the founder of a technique the value of which well continues to be realised in its extending application; Bunnell and Koch, who have shown the possibilities of reparative surgery of the hand. We have also derived inestimable help from our friendly association with their many disciples the world over, men of our own generation too numerous to list. Some of them are mentioned in the text where opportune, but we have purposely avoided full lists of reference work beyond those of direct concern to our immediate purpose.

We acknowledge with gratitude our personal debt to the beneficence of the Carnegie Corporation in the United States of America, the Nuffield Foundation in Great Britain and the Australian Red Cross Society. Each of these, through the National Health and Medical Research Council of Australia, have given us opportunity to see and study this work in Britain and America in the light of our own difficulties and problems. We hope that their trust and gesture have not been wasted.

Various reasons have prompted this work. First, it is obligatory on any who have had peculiar opportunity in a particular branch of surgery to record the value of that experience at some appropriate time. More especially does this apply if, as in our case, such opportunity has largely been possible as the result of the broader and impersonal vision of such a large number of our colleagues. Our early interest in hand injury, and perhaps some demonstration of improved results, has signalled a snowballing of opportunity.

The book is based on work done in the past ten years when a large portion of our time has been spent in the care of patients with injured hands of all types and in diverse stages. In the first half of this period, as a result of the policy of the Medical Directorate of the Australian Army Medical Corps, a large number of men with injured hands was concentrated under our care in an Army Plastic Surgery Unit. During this phase we experienced much of the many hazards associated with secondary repair in the wake of infection, long immobilisation, fibrosis and joint stiffness. Under these conditions reparative procedures were often attempted in ambitious fashion for some slight improvement in the function of a hand remnant. We would like to record the early encouragement and help we received from the late Brigadier W. A. Hailes and from Colonel C. W. B. Littlejohn, Consultant Surgeons to the Australian Army during this period when we were the instruments of their policy.

In the latter half of this ten-year period, at various hospitals in the city of Melbourne, we have had ample opportunity for the primary and continued

## PREFACE TO FIRST EDITION

treatment of recent hand injuries under circumstances impossible in arrangements of war. With the undoubted advantage of antibiotic drugs we have been able to apply primary reparative procedures with vastly improved economy and value to all concerned. It is the scope and place of these which constitute our main message.

Plastic or reconstructive surgery is variously considered as an arbitrary subdivision of surgical practice, but it is none other than a method or technique of surgery. Its scope is wherever this can be applied with value. We do not pretend that the management of hand injuries is the exclusive sphere of any particular sect or group. In centres the world over, hand injuries are concentrated and managed under diverse arrangements with equivalent results. We would categorically state, however, that the best can only be achieved where organisation permits of continuity of management by surgeons fully versed in the technique and application of plastic surgery, and we fail to see how this can be developed in any strictly regional manner within the confines of the hand. Any surgeon who deals with hand injuries must also be schooled in orthopaedic procedures relative to injury and in peripheral nerve surgery. There must be some reshuffle in surgical organisation to include surgeons of injury and repair, fully trained in these matters, and we are in full accord with the precept and example of Mr W. G. Gissane in Birmingham. It is a pity, however, that the term "traumatic surgery" is sometimes used for such work when, indeed, its password should be "atraumatic surgery".

Some excellent writings are available which deal largely with secondary reparative procedure and with septic conditions of the hand. Under present-day conditions, however, we feel these aspects are over-emphasised at the expense of a more detailed concern with primary treatment of injury. If primary treatment is all that it should and can be, there is a fast-diminishing need for secondary reparative procedures and infective complications become an increasing rarity.

Some separate attention has been given to hand injuries in children (Chapter XVII) so that certain common features of injury and repair in children can be underlined. This must not detract from the necessity for tempering any observation, opinion or management with the age or youth of the patient. The capacity of the young to heal, remodel and adapt is only believable to those familiar with the surgical care of children. No single general factor has a more pervading and profound influence on prognosis. Statements or claims which are not considered in this light by both reader and writer will cause much misconception in the management of hand injuries.

In the preparation of the book we have had much help from many kind people. First, our own immediate professional associates and staff, especially the nursing sisters and physiotherapists; secondly, our colleagues who have made possible our concentration of experience; and thirdly, those who have worked in direct preparation of the book itself—Mrs. W. A. Scott and Miss J. Boyd our typists, Olive and Joe Roach, Mr Roy Ingles and Helen Wischewsen who have been variously responsible for the illustrations. All have been patient and long-suffering.

## PREFACE TO FIRST EDITION

Professor Sydney Sunderland has been long and happily associated in the anatomical and neurological aspects of our work and has advised us in the anatomical presentation.

We have been fortunate to have as proof readers Mr R. Guy Pulvertaft of Derby and Mr A. B. Wallace of Edinburgh. We have valued their constructive criticism.

We hold the warmest regard for Mr C. Macmillan and Mr J. Parker, Directors of E. & S. Livingstone Ltd. The negotiations and smooth conduct of publishing, despite our separation by twelve thousand miles, would have been impossible without their help and co-operation throughout.

That our beloved mentor and champion of British Surgery throughout the Empire, Surgeon Rear-Admiral Sir Gordon Gordon-Taylor, should compile the foreword we take as a signal honour.

B. K. RANK.

A. R. WAKEFIELD

MELBOURNE,  
1953.

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- III. ORGANISATION IN RELATION TO HAND INJURIES
- IV. THE EXAMINATION AND APPRAISAL OF A RECENTLY INJURED HAND



## CHAPTER I

# THE SOCIAL SIGNIFICANCE OF HAND INJURIES

## THE INCIDENCE OF HAND INJURIES AND HOW THEY OCCUR

**A**PPROXIMATELY one in every three of the injuries which present to the casualty department of a metropolitan general hospital involves the hand. This high everyday incidence of hand injuries merits critical examination.

The source of hand injuries differs from that of accidents in general (Fig. 1). Accidents in industry are their dominant cause. Approximately one-third of the general factory accident rate concerns the hand, but the

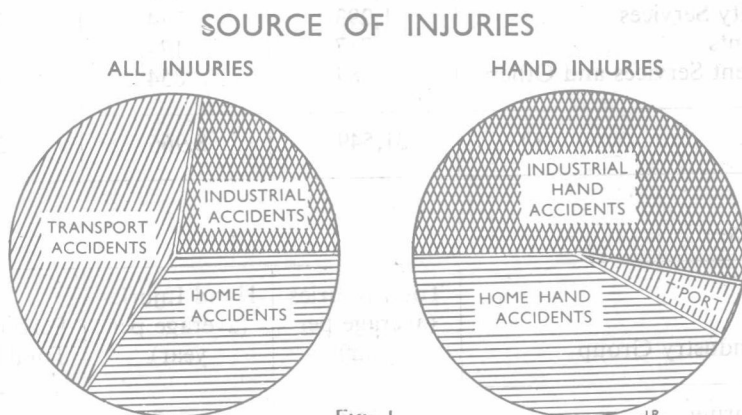


FIG. 1

### The source of hand injuries

The relative proportions in these diagrams are based on a yearly analysis of all injuries presenting to the Casualty Department of the Royal Melbourne Hospital, approximately 13,000 per year.

proportion varies in different industries (Table 1). Such is the diversity of accident laws and regulations in various states and in various countries, that any comparative study of figures is futile without a full appraisal of relevant legislation. An accident may be notifiable in one country and not in another.

Figures<sup>1,2</sup> studied from the first year of working of the National Health and Insurance Act in Great Britain (1949) first emphasised the magnitude of the problem. Of approximately 737,500 injury benefits for accidents and prescribed

<sup>1</sup> We gratefully acknowledge the kind personal help of Baroness Edith Summerskill (then Dr Summerskill, Minister of National Insurance) in obtaining this detailed information, and also the patience of her staff responsible for dissection and detailed breakdown of the figures.

<sup>2</sup> The more recent figures, also from the Ministry of Pensions and National Insurance, were obtained through the kind offices of Dr R. C. Webb, Chief Medical Officer, Australia House, London.

# SURGERY OF REPAIR AS APPLIED TO HAND INJURIES

Table 1

## HAND INJURIES IN INDUSTRY

VICTORIA 1958-1963

(A) MALES—

Industry Group	Total Injuries (average per year)	Hand Injuries (average per year)	Percentage of Total Injuries
Primary . . . . .	1,896	488	25.8
Mining and Quarrying . . . . .	293	81	27.7
Manufacturing . . . . .	13,538	4,581	33.8
Electricity, Gas and Water . . . . .	555	64	11.5
Building and Construction . . . . .	4,015	1,034	25.8
Transport and Communication . . . . .	1,790	286	16.0
Commerce . . . . .	3,407	1,113	32.7
Community Services . . . . .	1,293	274	21.2
Amusements . . . . .	717	174	24.3
Government Services and Others . . . . .	5,284	854	16.3
Totals . . . . .	31,549	8,966	28.5

(B) FEMALES—

Industry Group	Total Injuries (average per year)	Hand Injuries (average per year)	Percentage of Total Injuries
Manufacturing . . . . .	1,659	767	46.3
Commerce . . . . .	451	145	32.1
Public Authorities . . . . .	476	129	27.1
Amusements, etc. . . . .	464	154	33.3
Other . . . . .	515	99	19.2
Totals . . . . .	3,566	1,295	36.4

TABLE 1

The proportion of accidents which involve the hand in various industries in the State of Victoria is set out. This is based on a yearly average, over a five-year period 1958-1963, of figures given in *Industrial Accidents Statistics* from the Victorian Office of the Commonwealth Bureau of Census and Statistics. Only those industries of relative local significance as a cause of hand injuries are included. It should be realised that heavy industries such as shipbuilding and mining are insignificant in this State. They would be a prominent source of accidents in other countries. In Victoria, a factory as registered under the Factories Act is any establishment which employs four persons in handicraft, trade, or sale, or which employs only one person if half a horse power is also employed. The State Law is that any accident which keeps a man off work for one shift or for twenty-four hours must be reported.