

THE CONTRIBUTIONS OF SIR ARCHIBALD McINDOE TO SURGERY OF THE HAND

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MR. PRESIDENT, MEMBERS OF THE COUNCIL, FELLOWS, MEMBERS AND GUESTS:

In the year 1900 a NOVA, a new star, appeared in the constellation of the Southern Cross. In 1960 it suddenly ceased to glow, and disappeared from the galaxy.

It is a special privilege and pleasure to join you today in doing honour to Sir Archibald McIndoe. Since 1962 the McIndoe Lectures have been presented every two years by British plastic surgeons trained by or associated with Sir Archibald. These lectures have given eloquent testimony to the important role he played in times of war and peace, and to the unique place he occupied in the hearts of his patients and friends.

Your invitation to present this, the sixth Lecture, implies an honour of which I am well aware. I have accepted the invitation as a gesture of friendship to Sir Achibald's many surgical friends in America and to his former associates at the Mayo Clinic. As a personal friend, it was my good fortune to know him for more than 30 years, historic years for Britain and the world, during which he gave surgical skill to his patients, stimulating instruction to his pupils, and inspiring example to his colleagues.

Mayo Clinic years 1925–1930

I first met Archie McIndoe in 1927 when we were both in surgical training at the Mayo Clinic. He had arrived there from New Zealand in 1925. During that early period his dynamic personality soon became evident; his unusual ability to apply himself to a chosen task; and his determination to learn all that was then known about general surgery.

At first he engaged in basic research in pathological anatomy. Later his competence as a clinician and surgeon was recognized and he was appointed a Mayo staff-surgeon. If he had stayed in Rochester, McIndoe would have remained a general surgeon, but in 1930 he went to London,

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joined his cousin, Sir Harold Gillies, in plastic surgery, and the rest is well known.

During the years 1925 and 1926 McIndoe worked closely with another Fellow in surgery, Dr. Virgil Counsellor, who later became a staff surgeon at the Mayo Clinic, where he remained until 1957. In a recent



Fig. 1. Archibald McIndoe, taken during Mayo period (about 1925).

letter Dr. Counsellor, now retired in Arizona, has this to say about those early years:

'After Archie and I became acquainted (in 1925) we began to work together in pathology under Dr. H. E. Robertson. We soon became fast friends, and found that we had mutual ideas about the liver. We made corrosion specimens of the biliary tract and showed the effects of moderate and complete obstruction of the common duct due to stones or cancer. We demonstrated bilaterality of the liver by injections of the

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arterial trees and the portal and hepatic circulation. Archie made some of the finest drawings I ever saw to illustrate this work.

'One day during our work in the laboratory, Archie made an amusing remark. We were working many hours at night, often until midnight, while our wives sat with us and knitted. The following day was the 4th of July, and I said to Archie "You know tomorrow is Independence



Fig. 2. Dr. Virgil Counsellor, with whom McIndoe published a number of papers.

Day and we don't need to work". He said, "That's true, and it's also our (British) Thanksgiving Day."

'Archie became my first assistant in surgery when I became a staff-surgeon at the Mayo Clinic. He worked with me for one year, then became first assistant to Dr. E. S. Judd. He was an astute clinician and a marvellous technician. Archie often talked about "going back home", which to him was London, England.

'In 1936 I visited London, and of course had several days with him and his family. He took me to his laboratories and operating theatre,

and showed me his work on hypospadias and congenital absence of the vagina. I then introduced those procedures at the Mayo Clinic. Some of those I have done are modifications of Archie's procedures and are done today throughout the world.'

During that early period in Rochester a number of papers were published under the joint authorship of Counsellor and McIndoe. Several of these are concerned with biliary obstruction and what they called 'hydro-hepatosis'. McIndoe submitted two theses towards his M.S. degree: the titles were: 'The bilaterality of the liver' and 'Delayed haemorrhage following traumatic rupture of the spleen'.

My own close contact with Archie came in 1930, when we were both assistants to Dr. D. C. Balfour at St. Mary's Hospital. A famous comedian of the silent films, Charley Chase, came to the Mayo Clinic for a gastric operation by Dr. Balfour. It was then the practice to lavage the stomach with a large tube on the morning of surgery. It fell to Archie to perform this unpleasant task on his actor patient. Later that day, I said to him, 'How did Charley take the stomach pump?' He replied, 'I told him it was only a gag for his next movie, and all went well'.

The Mayo period was one of hard work and solid accomplishment for McIndoe. He set a jet pace for all of us, and his enthusiasm was contagious. It was a constant challenge to work with him and to maintain the mood he set. In spite of strict attention to work, he did not neglect the social side of life and his home was a focal point for visitors from New Zealand and Great Britain.

London—1932

In 1930 Archie left Rochester for London and began his association with Sir Harold Gillies. In November 1931 he passed the Primary Fellowship examination, in which I too had been successful in Toronto in 1929 (the first time it had been held outside London by English examiners). Archie now cabled me to come to London and sit the final examination with him.

In the meantime I had married a Rochester girl, and we sailed from New York on the S.S. *Berengaria* in January 1932. Archie met us at Waterloo Station and we spent the first night at his home on Pattison Road in Hampstead. The next day during a pea-soup fog he helped us find lodgings in a small hotel on Bloomsbury Square.

My first impressions of London in 1932 are still vivid. The general use of coal fires throughout the city created a condition now hatefully called air-pollution, but to me, a newcomer, fog seemed only to enhance the mystery of this historic city. At that time horse-drawn vehicles still clogged the narrow streets, and the kerbs were lined by entertainers,

some of them veterans of the first war. McIndoe's famous editorial 'A cornet in Piccadilly' was probably inspired by what was then a common sight.

On the lighter side, boys on the street were whistling tunes from Laurel and Hardy movies. 'Grand Hotel' with an all-star cast from Hollywood and Britain was the big film success. 'Cavalcade' was a stunning pageant-play of Britain at the turn of the 19th century. April the Fifth won the Derby, and Bart's beat Guy's Hospital at rugby. This was post-war London—as we thought; we did not dream that it was actually pre-war London by only seven years!

At Archie's suggestion I enrolled with him in the Refresher Course at Bart's for the final F.R.C.S. examination, and each morning he picked me up in his Humber. The course proved to be excellent. Clinical conditions could be seen in this great hospital, familiar to me only in textbooks. British teaching methods were now experienced for the first time. Formal lectures by Hume, Paterson Ross, Elmslie, Higgs, and Kenneth Walker reviewed the field of general surgery and the specialties. Personal quizzes in small groups, as in the evening classes of McNeill Love, revealed gaps in our surgical knowledge. These methods, conducted sometimes to the point of embarrassment, are, I believe, the most successful ever developed.

During the course of that year (1932) I visited the operative clinics of the great surgeons of London: Walton at the London Hospital, Lockhart-Mummery at St. Mark's, Ernest Miles at Fitzroy Square, Victor Bonney at the Chelsea Hospital, Sir Harold Gillies at the Hammersmith, and Lord Moynihan at Portland Place. In the afternoons I read in the Library of this College and examined the red-labelled specimens of John Hunter in the Museum. Years later I was shocked and saddened to hear of the severe bomb damage to this priceless collection.

In May 1932 I sat the Final Fellowship examination. In fantasy, I saw myself as a surgical Don Quixote jousting with the famous windmill in Lincoln's Inn Fields, where other famous executions had taken place centuries ago. The four blades of the mill were examiners, who were not impressed by a candidate who did not recognize a gumma in the thigh of a genteel school teacher.

Archie sailed through the examination with flying colours, but I was 'referred'. To console myself I went to Switzerland, climbed the Matterhorn, and concluded that the ascent of that mountain was much easier than passing the Final Fellowship examination.

The birth of hand surgery

The great war of 1939 produced notable changes in the practice of medicine in Britain as in America. It has been said that modern

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plastic surgery was born during the First World War; by the same token, modern surgery of the hand emerged during World War II.

During the Battle of Britain McIndoe struck a decisive blow when he ordered the discontinuance of tannic acid in the treatment of the burned hand, previously considered standard treatment, but which was causing strangulation of fingers and the imprisonment of pus under eschar. In his treatment of acute burns with saline baths and early grafting he



Fig. 3. Dr. Sterling Bunnell, civilian consultant in hand surgery to U.S. Army, World War II.

applied the basic principles of physiology and wound healing. His dictum, 'Burns of the hand must be grafted by the 21st day', was heard round the world. These changes in burn management initiated by McIndoe set the pattern in military hospitals on other continents. They resulted in the salvage of thousands of hands.

The war continued and Churchill's immortal 'few', to whom we owe so much, were being sustained medically and in morale by McIndoe and his team and by countless other medical men, some of whom are present today. A little later, at Oxford, Howard Florey was completing

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the final tests in the clinical use of penicillin, which had been discovered in 1928 by Alexander Fleming. This ended the era of crippling infections and made possible reconstructive surgery of the hand. In San Francisco Sterling Bunnell was assembling the material for his great book, *Surgery of the Hand*. Thus I think modern hand surgery was forged in the crucible of those great war years.

Surgery of the hand in the U.S. Army

In 1943 the Surgeon General of the U.S. Army, Norman Kirk, became aware of the large number of battle injuries of the hand being sustained by American troops and of the need for special care of these casualties. He appointed Dr. Sterling Bunnell as a special civilian consultant in surgery of the hand, to guide, integrate, and develop this work and to set up centres for this purpose. Nine such centres were established in army hospitals.

Due to the shortage of surgeons qualified in the management of hand injuries Dr. Bunnell gave special intensive courses at various army hospitals. Thus it was that in January 1945 I attended one of them and was captivated by Dr. Bunnell's presentation. Shortly thereafter I eagerly accepted the opportunity to join the centre at Wm. Beaumont General Hospital, El Paso, Texas, under his direction. Through this course of events I was led away from general surgery to this new and fascinating field to which I have devoted myself for the rest of my professional life.

Ten surgeons were needed to carry the work load in this centre, where more than 3,000 hands, disabled by bullet or shrapnel wounds, burns, or infection, were collected from the European and Asiatic theatres of war. Bunnell's new book had just been published and was our indispensable guide. Dr. Bunnell made rounds every two or three months and performed operations in which we assisted him. We learnt from him not only his techniques but also that he wished his assistants to remain silent and immovable while he performed his rapid surgery. Later we operated on hands while he observed and criticized—a nerve-racking experience. During this period Mr. Ronald Furlong and other other visitors from overseas came to El Paso to observe the work being done by the team.

American Society for Surgery of the Hand

As the war approached its end a group of surgeons who were working in army hospitals under Dr. Bunnell's direction gathered in Chicago to organize the American Society for Surgery of the Hand. He became the first president and Dr. Sumner Koch the second. Founder members numbered 35. Canadian surgeons participated from the beginning. Dr. A. W. Farmer of Toronto was a founder member, Dr. Gordon Grant of Victoria, B.C., is a past-president, and Dr. Martin Entin of Montreal is now president-elect.

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The Hand Club of Great Britain

In 1946 Dr. Bunnell came to London and lectured at Guy's Hospital Medical School and at the Royal Society of Medicine, where he received an enthusiastic reception. He then went to East Grinstead to spend time with Sir Archibald, who showed him the reconstructive work on the burned hand. Later he remarked to me on the meticulous technique and smooth teamwork he observed in McIndoe's operating theatre.



Fig. 4. Sir Archibald McIndoe, consultant to the Royal Air Force, World War II.

In Derby he met a gifted surgeon, Mr. Guy Pulvertaft, whose Hunterian Lecture in 1948 reflects the advanced state of hand surgery in his clinics at that early date. Mr. Pulvertaft was to become the doyen of British hand surgeons, and Derby a centre in which many were to receive training.

Archie had told me in 1950 of his plans for a hand society in Great Britain. On 7th November 1951 these plans came to fruition when the inaugural meeting of the Hand Club of Great Britain was held at the Athenaeum Club, London. Founder members included Patrick Clarkson, Ronald Furlong, J. I. P. James, Rainsford Mowlem, F. T.

Moore, R. G. Pulvertaft, James Whillis, and Sir Archibald McIndoe. This club had a limited membership. Annual meetings were held at the members' hospitals in turn.

The Second Hand Club

So great was the interest in surgery of the hand in Britain that on 11th May 1956 the Second Hand Club came into being. The first meeting was held in Derby at the invitation of Guy Pulvertaft. Founder members included Adrian Flatt, Stewart Harrison, Douglas Reid, Robert Robins, and Graham Stack. In this club there were no officers, only a chairman for each meeting. Graham Stack became the guiding genius of this club (later of the society), and editor of *The Hand*, a journal (published by Livingstone) devoted exclusively to surgery of the hand. It is interesting to recall that both hand clubs held annual meetings until 8th October 1964 when, at the Charing Cross Hospital, they were merged to form the British Society for Surgery of the Hand.

British Society for Surgery of the Hand

On 15th November 1968 the first meeting of the joint society was held at the London Hospital under the presidency of R. G. Pulvertaft. Succeeding presidents have been John Barron (1970), Athol Parkes (1971), Stewart Harrison (1972), and Graham Stack (1973), thus alternating orthopaedic and plastic surgeons.

As a founder member and past-president of the American Society for Surgery of the Hand and overseas member of the British society for 10 years, I have observed with pleasure the rapid development of hand surgery, as fostered by these two groups. It has been the policy of the American society each year to invite a British or European surgeon to be a guest speaker at the annual meeting, after which he then became an honorary member. Likewise a number of American surgeons have been invited to join the British society as overseas or corresponding members. This transatlantic alliance has been close and cordial. Australia and South Africa have also participated.

European meetings

The Second Hand Club forged European (Continental) links by another method. In May 1961 a contingent of British hand surgeons embarked from Tilbury dock for Scandinavia, a sort of Viking raid in reverse. After an overnight voyage, they landed at Göteborg, where they were met by Erik Moberg, father of hand surgery in Scandinavia, who convened the meeting at the Sahlgrenska Hospital.

The group then travelled by bus to Malmö for another bilingual session as guests of Nils Carstam. Finally they crossed the Öresund to Copenhagen, where the final meeting and banquet at Domus Medica

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had been arranged by Knud Bang-Rasmussen. In the after-dinner speeches Dr. Erik Moberg commented on the bloodless surgical invasion of Scandinavia by the British, and in response Mr. Norman Capener, with wit and finesse, remarked on the improvement in Anglo-Scandinavian relations since the time of King Canute.



Fig. 5. Mr. R. G. Pulvertaft, C.B.E., founder member of the Hand Club of Great Britain.

During the 1960s other joint meetings were arranged under the auspices of the British and American groups. Outstanding among these were the Anglo-Scandinavian Symposium of Hand Surgery in Lausanne and Vienna (1967) at the invitation of Dr. Claude Verdan and Dr. Hanno Millesi respectively and the joint meeting of the American and French Hand Societies in Paris (1968) at the invitation of Raoul Tubiana. Hence the British and American societies, with the enthusiastic participation of European surgeons, carried abroad the torch of hand surgery.

Societies for surgery of the hand now exist in most European countries, in Japan, and in South America. The International Confederation now lists 13 countries each having its own society.

Thus in only 25 years (1945-70) a new discipline of surgery appeared. Today throughout the civilized world skilled hand surgeons may be found. In the kindling of these fires Sir Archibald and his fellow founding members of the British Hand Club served posterity well.

Sir Archibald McIndoe's contributions

There are two fields of hand surgery in which McIndoe's influence was strongly felt and for which he will be remembered. The first, the treatment of acute burns of the hand, has been mentioned. To this should be added his contributions to reconstruction of the burnt hand and the correction of its deformities and contractures: flexion, hypertension, buttonhole, clawing, webbing, and the clumping together of fingers into a useless mass of cold, glazed, bluish tissue. In this rebuilding of the hand McIndoe and his surgical staff members at East Grinstead applied their fertile imagination and skill in the use of pedicle tissue, free grafts, Z-plasty, arthrodesis, and arthroplasty—all the modalities of plastic surgery.

One of Archie's patients, William Simpson, was inspired by his treatment at East Grinstead to write this memorable bit of prose. I quote from the book *I Burned My Fingers*¹:

'Meanwhile, sobered and stirred by my various visits to Roehampton, I appreciated the human hand more than ever before and cast a very keen eye upon its marvels. It became an obsession with me to notice people by their hands, to attempt in this way to read their characters, and always to have deep respect for this miracle of nature. I was prepared to believe that none of the more glorious achievements of nature surpassed that of the human hand. I saw it anew in all its strength, beauty and complexity. It was not just a mass of interlocked muscle, nerves, joints, blood and flesh. It was not merely a fascination for the artist, a thing of delicate beauty or a proof of hard labour. It was a marvel of unconscious mathematics and mechanics, yet it was also an artistic marvel conceived in love, and evolved over billions of years.'

Still another hand condition challenged McIndoe—the contractures of Dupuytren's disease. He developed a carefully planned radical fasciectomy, and during the post-war years this technique was continued. His paper with Beare in 1958 summarized his considerable experience of radical fasciectomy for this condition. A careful appraisal of McIndoe's cases by personal follow-up examination was made at East Grinstead by Robert Hakstian of Montreal in 1966. It showed a large number of excellent results, with low incidence of recurrence, achieved by the radical technique.

In the meantime, McIndoe's brilliant pupil Tord Skoog, working in Uppsala, Sweden, was to give a change in direction to the treatment of Dupuytren's contracture. Skoog's operation was more superficial in the palm. He removed only those pretendinous and paratendinous bands in the palm that were causing contracture, leaving intact the transverse palmar fascia in the distal palm and the structures beneath it.

It is now generally recognized that deep dissection and removal of sizeable blocks of tissue in the distal palm near the base of involved fingers causes postoperative swelling and stiffness of those fingers due to passive congestion. This results in a prolonged period of recovery for the hand—sometimes with permanent disability. Fasciectomy within the involved digit, however, may be quite complete without causing such digital oedema. It should be noted that McIndoe's radical fasciectomy, done with meticulous technique on a significant number of patients, made possible a meaningful comparison of the 'radical' and 'conservative' methods.

Valediction

I should like to conclude by pointing out some similarities in the lives of Sterling Bunnell and Archie McIndoe. Both men were general surgeons who explored new frontiers. Both served as civilian consultants in time of war. They both possessed abundant energy and zest for life.

During his last years, Dr. Bunnell continued to practise, in spite of poor health, and literally had to use oxygen on his daily hospital rounds. Sir Archibald likewise was beset with trying problems of health during his last years. But both of them, like the ill-fated climbers Mallory and Irvine on the British Mount Everest Expedition of 1924, shouldered their oxygen tanks and proceeded towards the summit.

In *The Fight for Everest, 1924* Lt.-Col. E. F. Norton, D.S.O., writes²: 'George Leigh-Mallory was no common personality. Physically he always seemed to me the beau ideal of the mountaineer. His graceful figure was the last word in wiry activity, and he walked with a tireless swing, a man with whom few could live uphill. But it was the spirit of the man that made him the great mountaineer he was: a fire burnt in him and caused his willing spirit to rise superior to the weakness of the flesh. His death robs us of a loyal friend, a knight "sans peur et sans reproche".'

It is not difficult to apply these words to Sir Archibald McIndoe and to the Himalayan heights he achieved during his all too brief lifetime.

REFERENCES

1. SIMPSON, W. (1956) *I Burned My Fingers*. London, Putnam.
2. NORTON, E. F. (1925) *The Fight for Everest, 1924*, p. 145. New York, Longmans Green.