



# Severe Burns in World War II

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## Medical History

# Severe Burns in World War II.

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## INTRODUCTION

The Ulster Auxiliary Air Force Squadron RAF 502 were former “weekend flyers”. Officers and most of the air and ground crew were from Ulster<sup>1</sup>. Supported by their medical and surgical care and their leadership they contributed decisively to Allied victory in World War II .

At 3:15 AM on 27<sup>th</sup> April 1941, Pilot Officer Christopher Carmichael of 502 Squadron took Whitley aircraft Z6501 to roll out on Limavady’s partially completed airfield. A crew of 6, including Pilot Officer Christopher Carmichael, Flight Lieutenant John Dickson, Sergeant Desmond “Des” O’Connell, Sergeant Stanley William Dorney, Sergeant Fred Redhead, Sergeant John Wilson (Air Gunner) were scheduled for a ten-hour anti U-boat patrol over the Atlantic. Shortly after take-off, the starboard propeller broke off. The Whitley hit Loughermore Mountain being unable to gain altitude or fly level on one engine. Fire broke out and ignited aviation gasoline and the 250 pound bombs<sup>2,3</sup> (Fig.1).



*Fig 1. Two Whitley Bombers Airborne*, by Robert T. Horvath (1942-), 1989. Oil on canvas, 61 x 92 cm, copyright of the Yorkshire Air Museum and Allied Air Forces Memorial, Elvington, UK, and reproduced with their permission. Mark V and VII were flown from Limavady RAF Airfield in 1941 by 502 Ulster (Auxiliary) Squadron. Mark VIIIs were designed specifically for Coastal Command. With a crew of six, the VIIIs had a flight endurance of approximately 11 hours.

Flight Sergeant Des O’Connell exited in the middle of the fuselage. The fuel tank ruptured and drenched O’Connell who became ablaze. Flight Sergeant Redhead stamped and swatted O’Connell’s flames, severely burning his hands.

Flight Lieutenant Dickson, the plane’s commander was also badly burned and losing blood from head wounds, but Sergeant O’Connell was even more severely burned. Dickson collapsed and cows licked O’Connell’s wounds<sup>3,4,5</sup>.



*Fig 2. Sir Archibald McIndoe (1900-1960)*, by Edward Irvine Halliday, painted 1962-63, oil on canvas 92 x 72 cm, courtesy of Hunterian Museum at the Royal College of Surgeons of England and reproduced with their permission solely for this Medical History.

## BURN TREATMENT

The treatment of the aircrew’s burns had been recently updated. On November 6<sup>th</sup>, 1940, after their experience

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of treating RAF pilots in the Battle of Britain<sup>6</sup>, Archibald McIndoe and Sir Harold Gillies had spoken to the Royal Society of Medicine. The aim of “the treatment of burns was to save life and preserve function”<sup>7</sup>. Coagulation, especially by tannic acid, had been carried too far<sup>8,9</sup>. There must be no coagulation of third degree burns. The raw surface of a third degree burn must be covered by a skin graft. McIndoe continued “he was getting good results by treatment with saline baths at 105°F. The patient could be totally immersed and usually found after the first bath that pain was relieved.” Sir Harold Gillies “thought that saline treatment was improved by the Bunyan bag. An accompanying *Lancet* editorial fully endorsed the views of Archibald McIndoe and Sir Harold Gillies and added that a Bunyan bag was an oiled-silk envelope which could encase the limb<sup>9</sup>. Five months after the RSM concordat, Max Rosenheim<sup>10</sup> and Roe Valley Hospital Matron Mabel Huddleston<sup>11</sup> and their team so treated Des O’Connell and John Dickson. The local priest said he found it almost impossible to find anointable flesh on Des O’Connell except at the midriff<sup>5</sup> (Fig. 2) (Fig.3).

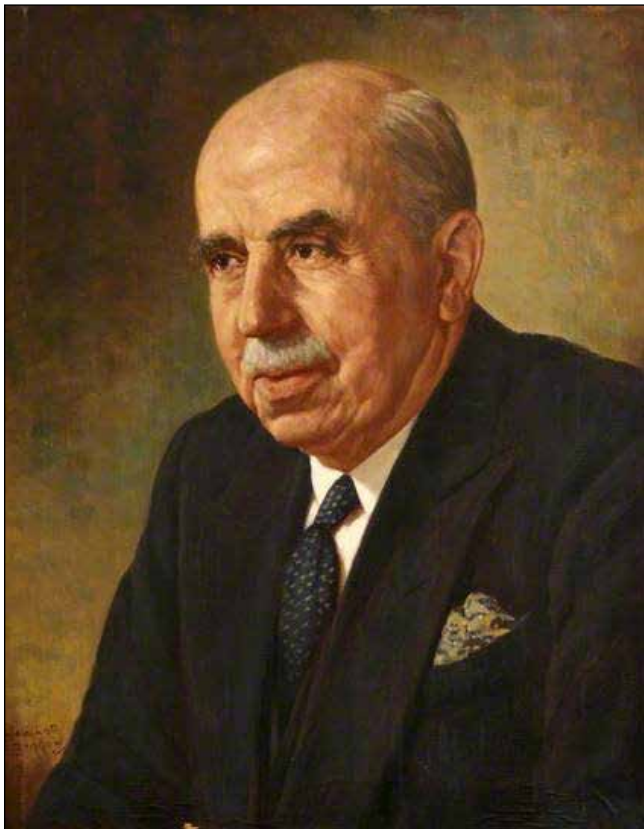


Fig 3. Sir Harold Delf Gillies (1882-1960), oil on canvas, by Howard Barron, painted 1962, 52 x 42 cm, courtesy of Hunterian Museum at the Royal College of Surgeons of England and reproduced with their permission solely for this Medical History.

## LIMAVADY HOSPITAL

By 7:00 AM on 27<sup>th</sup> April 1941 the crew of Whitley Z6501 were all admitted to Roe Valley Hospital, Limavady<sup>2</sup>. Max Rosenheim, later Lord Rosenheim, PRCP, gave instructions for immediate intravenous resuscitation, 24 hour saline baths at 102-105° for Des O’Connell, and Fred Redhead. John

Dickson’s blood loss was corrected and his limb burns placed in Bunyan bags containing tepid 2% saline. Rosenheim, recalled from the Massachusetts General Hospital to supervise Northern Ireland military medicine, had previously formed the highest opinion of Matron Mabel Huddleston and staff<sup>12,13</sup>. Huddleston summoned Benjamin Rycroft<sup>14</sup> from Musgrave Park to assess the burned eyelids. Rycroft organized the transfer several days later of O’Connell to Princess Mary’s RAF Hospital, Halton, Buckinghamshire<sup>15</sup>, where Bunyan had developed the bags. O’Connell’s family, his parents and a priest brother were unable to fit into the RAF evacuation plane, an Oxford, and were left behind. The transfer flight of Des O’Connell was eventful. The Luftwaffe were bombing Liverpool so the RAF provided an escort of three fighters. Having delivered O’Connell safely<sup>4</sup>, the RAF fighters performed victory rolls before returning to their Northern Ireland base. Senior RAF staff were not amused. Archibald McIndoe operated on Des O’Connell both at Halton and later from Ward III at East Grinstead, where O’Connell was elected an early member of the Guinea Pig Club<sup>16,17,18,19</sup>(Table 1).

TABLE 1.  
*Burn Injuries to RAF Home Force, 1939-1945*<sup>20</sup>

| BURN SITE        | 1939 | 1940 | 1941 | 1942 | 1943 | 1944  | 1945 | TOTAL |
|------------------|------|------|------|------|------|-------|------|-------|
| Head             | 2    | 5    | 3    | 7    | 4    | -     | 10   | 31    |
| Face/Mouth       | 7    | 77   | 123  | 130  | 113  | 205   | 170  | 825   |
| Eye Area         | 4    | 14   | 36   | 55   | 23   | 50    | 40   | 222   |
| Ears             | -    | -    | 1    | -    | -    | -     | 10   | 11    |
| Neck             | 1    | 2    | 2    | 3    | 6    | 20    | -    | 34    |
| Chest            | -    | 3    | 2    | 12   | 2    | -     | 10   | 29    |
| Back             | 2    | 2    | 5    | 10   | 5    | -     | -    | 24    |
| Abdomen          | -    | 2    | 6    | 2    | 3    | -     | 10   | 23    |
| Pelvic area      | -    | 2    | 4    | 5    | 8    | 19    | -    | 38    |
| Arm-Hand/Wrist   | 6    | 97   | 167  | 204  | 263  | 478   | 210  | 1,425 |
| Arm-Rest of limb | 1    | 23   | 69   | 82   | 86   | 178   | 80   | 519   |
| Leg-Foot/Ankle   | 12   | 91   | 169  | 195  | 181  | 292   | 150  | 1,090 |
| Leg-Rest of limb | 3    | 49   | 67   | 94   | 83   | 275   | 80   | 651   |
| Totals           | 38   | 367  | 654  | 799  | 777  | 1,517 | 770  | 4,922 |

Des O’Connell was not the first RAF 502 Ulster Squadron crewman to become a McIndoe guinea pig. Thomas Percy Gleave (1903-1993), C.B.E., U.S. Legion of Merit, joined the RAF in 1930 and served in 502 with Coastal Command. Transferred to Bomber Command, then Fighter Command, he was shot down over Biggin Hill on 31 August 1940. Badly burned, he was operated on seven times by McIndoe and twice by Percy Jayes, later Head of Plastic Surgery at Barts. Gleave returned within a year to command RAF Manston in Kent, and ended World War II as Chief of Air Plans at SHAEF under Eisenhower. Gleave remained the one and only “Chief Guinea Pig”<sup>18</sup>.

Varaztad H. Kazanjian emigrated from Turkish Armenia to Worcester, Massachusetts in 1895 at the age of sixteen. He found work in a wire mill. His dexterity with steel wire and Armenian Jesuit training gained him a scholarship to Harvard Dental School and a job at the Peter Bent Brigham Hospital. Harvey Cushing, in 1915, took Kazanjian to France with the Harvard Surgical Unit, where Kazanjian worked at Dannes-Camiers from 1915-1919. Kazanjian was superb at

Maxillofacial Orthopaedics, which he successfully performed on over 3,000 Allied wounded during World War I<sup>21</sup>; those requiring major plastic surgery were sent to Gillies and Ivor Magill at Sidcup<sup>22</sup>. Gillies tried to recruit Kazanjian to Sidcup, much to the annoyance of President A. Lawrence Lowell of Harvard who granted Kazanjian a Harvard MD in 1922<sup>21</sup>.

On 16 August 1919, A. Lawrence Lowell had written to Kazanjian: "I was very much grieved to hear of your wife's death. I hope the child will grow to be a consolation to you, as you abundantly deserve"<sup>23</sup>. She did, and the second Mrs. Kazanjian and their children did likewise. This maternal death was caused by peritonitis after a caesarean section (Fig. 4).



Fig 4. Professor Varaztad Hovhanness Kazanjian (1879-1974), oil on canvas by Dr. Robert Shaw Wesson (1902-1967), painted 1960-67, 61 x 51 cm (24 x 20 1/16 inches), Harvard University Portrait Collection, Gift of Mrs. Robert S. Wesson to the School of Dental Medicine, 1979; Reproduction courtesy of the Harvard School of Dental Medicine, Boston, MA and the Harvard University Art Museums, Cambridge, MA, No. H717. Photograph by Susan R. Symonds, Mainframe Photographics, Inc., Boston, MA.

## AFTER WORLD WAR I

Gillies and Pomfret Kilner who were later joined by McIndoe and Rainsford Mowlem, another Kiwi, "would go anywhere"<sup>18</sup> to operate and treat patients with burns and maxillo-facial abnormalities. Gillies, Kilner, McIndoe and Mowlem, known as the "Big Four" conducted the only plastic surgery clinic of any size at St. George's Hospital, Tooting, with a total of 25 beds<sup>18</sup>. Rainsford Mowlem (1902-1986) and Archibald McIndoe were classmates in medical school at Dunedin. After two years as House Surgeon at Auckland

Hospital, Mowlem became a ship's surgeon to work his way to London. In 1929 he gained his FRCS Eng<sup>18</sup>. Gillies recruited Mowlem as an assistant. His predecessor had died suddenly after eating too much Christmas Pudding (or so said Gillies). In 1936 Mowlem became consulting plastic surgeon to the Middlesex Hospital and Medical School and junior partner of Gillies and McIndoe. Pomfret Kilner by 1916 was in charge of orthopaedics at Number 4 Base Hospital at Dannes-Camiers. Post-war he was advised to work with Gillies, which he did for ten years.

After World War I, Kazanjian and Gillies continued to exchange letters chiefly about techniques of nerve regeneration<sup>24</sup>. Kazanjian visited "Giles", as Gillies was affectionately known, in London and "Giles" was royally entertained by the Harvey Cushings in Boston<sup>25,26</sup>. Sir Harold Gillies wrote in 1957 to Professor Kazanjian, "So I thank you dear friend for all that has happened since the day that you arrived in Wimereaux in 1915. My wife for 46 years died...this Spring. I had a very tough time, and now comes into my life in a different way my own special friend who has looked after me surgically for over 20 years, and she has decided to hitch me on to her bandwagon. We get married on November 5<sup>th</sup>. All the best to you." Signed Giles<sup>27</sup>. The new Lady Gillies, Marjorie Clayton, was always most popular with everyone at Barts.

It was not until 1939 and the onset of World War II that the establishment of Emergency Medical Services (EMS) burn and plastic surgical units at East Grinstead, Hill End in St. Albans, Roehampton and Rooksdown House, Basingstoke that plastic surgeons were trained in significant numbers in the UK; sixty had been trained in the U.S. following Gillies' 1920 visit<sup>18</sup>.

## WORLD WAR II AND AFTER

During World War II, Kazanjian became Harvard's first Professor of Plastic Surgery. On my\* arrival at the Massachusetts General Hospital, I learned from him that his friend 'Giles' had told him of my father's rescue of the burned from the sinking of the RMS Lancastria on 17 June 1940<sup>28,29</sup>. Over 1400 tons of fuel oil had leaked into the sea which was partially set ablaze. The burned survivors had been sent to Gillies at Rooksdown House, formerly the private wing of the Park Prevet Hospital, Basingstoke, Hampshire<sup>29</sup>.

During 1955-1960, the last years of their lives, Giles (Gillies) and Archie (McIndoe) gave advice to the Pink Firm of surgeons at Barts. Gillies had been awarded four Barts beds in 1936<sup>18</sup>. In 1958 and 1959, I was Pink Firm House Surgeon and later Chief Resident at Barts. Giles gave advice on fistulae management<sup>30-39</sup> and Archie on abdominal surgery for tropical disease<sup>40-42</sup>. My boss, Sir Clifford Naunton Morgan was Archie's sole trustee. Giles, Archie and Cliff were wonderful mentors. Patients, doctors, nurses and orderlies, were awed and generally complied with their advice.

Sergeant Des O'Connell was promoted to Flight Lieutenant

\* This and other first-person references refer to the first author.



and post-war had a successful career in Air Traffic Control at Heathrow, and in 2015 remained the oldest guinea pig<sup>43,44</sup> (Fig.5).



Fig 5. Des O'Connell is at the extreme right as the Princess Royal in October 2013 opens four new operating rooms at Queen Victoria Hospital, East Grinstead. Bob Marchant, secretary of the Guinea Pigs Club is on the Princess Royal's left. Beribbbboned Derek Martin received severe burns as he crashed into the Atlantic in 1941. After successful surgery by McIndoe, Martin recovered to fly over Hiroshima after the atomic blast<sup>43,44</sup>. Photograph reproduced with the permission of the *East Grinstead Courier* exclusively for this Medical History.

When I first was introduced to Professor Kazanjian in 1960, he greeted me warmly. For the next 14 years he was the noblest and most erudite influence for good at Harvard Medical School. Joe Murray, 1990 Nobel Laureate in Medicine<sup>45</sup> has written of Dr. Kazanjian "He was one of the kindest persons I have ever known." Always available even after he gave up [in 1964] his "private practice" for even greater good to humanity<sup>46</sup>.

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