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Transfusion on the Burma Railway: The life of Jacob Markowitz

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Abstract

At the surrender of Singapore on 15 February 1942, over 100,000 men became prisoners of the Japanese. This included many medical officers who, over the ensuing years, treated men (and some women) suffering the ravaging effects of disease, worsened by the inhumane conditions of captivity. Many medical officers stand out for their work. One in particular, Jacob Markowitz, developed a blood transfusion service, under the most extreme conditions, for the sick working as slave labour on the Burma Railway. Although he qualified 20 years before the outbreak of war, little has been written of Markowitz's early life, or of the impact of this on his war-time contributions.

Keywords

Jacob Markowitz, transfusion, experimental physiology, Burma Railway, anti-Semitism

Introduction

At the surrender of Singapore on 15 February 1942, over 100,000 men became prisoners of the Japanese. This included many medical officers who, over the ensuing years, treated men (and some women) suffering the ravaging effects of disease, worsened by the inhumane conditions of captivity. Many medical officers stand out for their work. One in particular, Jacob Markowitz, developed a blood transfusion service, under the most extreme conditions, for the sick working as slave labour on the Burma Railway. One of his patients, Frank Hardy, wrote in 1946 expressing his thanks, 'Especially to Captain Markowitz shall I be most grateful for under his supervision I received seven transfusions and I am certain that without them I would not be writing this letter.'[1] One of us (AWF), met Markowitz at Alexandra Military Hospital, Singapore in December 1941, and remembers him as a 'great teacher,' who told people that he was 'first and foremost an experimental physiologist, and had always operated on dogs,' but went on to say 'from now on it will be human patients, and I will enjoy it, as I am a qualified doctor.' Little has been written of Markowitz's early life, or of the impact of this on his war-time contributions.

Early days

Jacob Markowitz was born Jankel Marcovici on 17 September 1901 in Bucharest, Romania, the first child of Hercu and Jeanette Marcovici. In 1903 a sister, Mina was born, followed in 1905 by a second sister, Sadye. Hercu had been conscripted into the Romanian army, initially as a groom but he learnt to ride and became the army's only Jewish cavalryman. However, facing 20 years of military service, he deserted and returned to his father's home in Bucharest where he evaded the pursuing police by hiding in a wine barrel.

In 1905, during an anti-Jewish pogrom Hercu was attacked, and the Marcovici home was looted; fortunately Jacob and his family were given refuge in the basement of a Christian neighbour's house. As a result, Hercu decided to emigrate to Canada in 1907, with the rest of the family arriving in August 1908. A year after their arrival a third sister, Boshe, was born. The family settled in Terauley Street, a Jewish area in Toronto, where they kept chickens and geese in the basement. Hercu changed his name to Harry, and the family name to Markowitz, and he became a Canadian citizen in 1911. He worked in nearby Eaton's clothing factory, where in 1912, he was attacked by detectives during a strike. Badly injured, he was discovered by his wife the following day. In response, he left the factory and established a lunch counter in the ground floor of their house. Jacob initially attended Alice Street Public School and then moved to Jarvis Collegiate

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School, the oldest public high school in Ontario. He matriculated in 1918 and was described as 'a good thinker, good worker and good sport.' He excelled at Jarvis, and developed a love of reading, often using his lunch money to buy books at Britnell's bookshop. His flair for writing also became apparent when, in 1917, he won the Canada Victory Loan Essay Competition.

Jacob entered the University of Toronto Medical School in 1918, aged 17; he was the youngest and smallest in the class of some 200 students. After a year of study, he started a summer job working in the pharmacy of Eaton's department store, a well-established company. However, he was sacked on his first day, when his manager learnt he was Jewish. In need of income, he called himself James Morrison and obtained work in Port Hope, Ontario, selling pots and pans. When he told his landlady that he was a medical student, she was suspicious and asked the local doctor to assess his medical knowledge, an examination he passed with flying colours. Jacob graduated MB (Tor) in 1923, being awarded the Gold Medal in medicine that year. In the student year book it was written 'we shall hear of him again.' He was very proud of the MB degree which, in Canadian eyes, was superior to the more widely awarded MD, given by most North American establishments. After graduation he approached Toronto General Hospital, but was informed they were not seeking interns that year. He remained in Toronto to study for a PhD, in the Department of Physiology, the degree being awarded in 1926. During this period he was awarded the Ellen Mickle Fellowship and the Reeve Prize.

Toronto's Department of Physiology had become world famous following the isolation of insulin and its use in the treatment of diabetes mellitus. The head of department, Professor JJR Macleod, was awarded the Nobel Prize in Physiology or Medicine in 1923, jointly with Dr Frederick Banting. Critical to their experimental studies were dogs rendered diabetic by pancreatectomy. It was studies of insulin on phosphate and carbohydrate metabolism in diabetic dogs that formed the basis of Markowitz's first research paper, submitted in July 1924.[2] The lead author was Frank Allan, a research fellow in the department and another Toronto medical graduate. In 1922, as a senior medical student, Allan had witnessed the first administration of insulin to a human patient, 14-year-old Leonard Thompson, at the Toronto General Hospital.

In May 1925, Macleod delivered his Nobel Lecture. In this he described the work which had led to the isolation, purification and subsequent use of insulin. He also referred to on-going work in the department being undertaken by, amongst others, Markowitz, in which dogs, following pancreatectomy, had been kept alive with daily insulin injections for up to 18 months.[3] One month later, a paper authored by Chaikoff, Macleod, Markowitz and Simpson detailing metabolic changes following the administration of insulin to hyperglycaemic diabetic dogs, was submitted to the *American Journal of Physiology* and published later that year.[4]

A move to Scotland

In the spring of 1926, Macleod wrote to EP Cathcart, Professor of Physiological Chemistry at Glasgow University, to ask if he would accept 'an able recent medical graduate.' In his letter, Macleod noted that Markowitz was a 'Semite' and hoped this would not give rise to any difficulty in Glasgow. Robert Garry, a contemporary at Glasgow, later remarked that Cathcart was taken aback by the comment, since 'although there were many faults at Glasgow at that time, anti-Semitism was not one of them.'[5]

In October 1926, Markowitz sailed to Glasgow to take up the position of Second Assistant to Cathcart, whose scientific interest was understanding the control of energy expenditure. Markowitz rapidly adapted to the department and was noted to be 'a vivid departmental personality… having a wonderful time studying the habits and beliefs of his new colleagues.' Colleagues found him to be extremely knowledgeable, not only in physiology and medicine, but also in current affairs, both in America and Europe. However, he admitted to a lack of manual dexterity, and to rectify this he subsequently applied to Frank Mann at the Mayo Foundation, where he later received training in experimental surgery. Markowitz was tasked by Cathcart to study indirect calorimetry in humans and he soon mastered the experimental techniques. It was, however, viewed as not very tactful when he wrote a paper in the name of Cathcart and himself, in the format of the *Journal of Physiology*, before making a single observation. However, the paper was accepted, and published in September 1927.[6]

In the department, Markowitz was able to recount first-hand details of the discovery of insulin. He talked almost wholly of Macleod; Banting, Best and Collip were rarely mentioned. Never once did he give any hint of the bad blood which was known to be a feature of the four men's relationships. It was apparent that if Markowitz was, as seemed most likely, aware of the discord, he ensured he did not pass any unfavourable comment. In 1963, Markowitz recalled that, whilst in Glasgow, he attended the spring meeting of the Physiological Society in March 1927 where he met and talked with Ernest Starling. A few months later, Cathcart informed members of the laboratory that Starling had died, alone, whilst *en route* to Jamaica. All were aware that Starling had had a colectomy, but the rather eccentric nature of his demise led Markowitz to conclude that Starling had decided he did not want to be a burden to his family, and that he wished to be remembered 'in his prime, not as an invalid.'[7]

A return home

In July 1927, Markowitz sailed from Glasgow and arrived in Quebec eight days later. Despite having been away for nine months, he continued to publish the results of work performed in Toronto. Although several papers reported the metabolic changes associated with experimental diabetes (which in many cases also involved hepatectomy),[8] he also authored a paper on the role of spinal anaesthesia in experimental ileus.[9] His co-author was Dr Walter R Campbell who, in 1922, had been responsible for administering the very first dose of insulin to Leonard Thompson. This was an unrefined extract known as 'Macleod's serum.' It was ineffective, but was followed by a second dose of 'Collip's extract' which, in contrast, proved highly effective at reducing Thompson's hyperglycaemia.[10]

Markowitz's application to the Mayo Foundation was successful. In October 1927, he travelled to Rochester, Minnesota to work as an Assistant to Frank Mann, an internationally recognised authority in experimental surgery and physiology. He had been appointed to the Mayo Foundation in 1914, and was noted to be a prolific researcher, and a man with exceptional surgical skills. At the Mayo his prime interest was the function of the liver, both in health and disease, although his surgical interests led him to a range of other areas of investigation.

One of Markowitz's earliest papers from the Mayo Foundation reported the toxic effects of defibrinated blood on the perfused mammalian heart.[11] Blood was defibrinated by 'gently whipping with wooden sticks for up to 10 minutes, before being passed through a gauze sieve.' Defibrinated blood was toxic to the perfused heart but it was later demonstrated that, *in vivo,* any toxic elements were removed when blood passed through the lung. This knowledge was to prove critical to his war-time service.

Another area of interest was the autonomic innervation to the colon and rectum. Experimental studies were undertaken in dogs in conjunction with James Learmonth, Associate Professor of Neurological Surgery.[12] A Scot, Learmonth qualified from Glasgow in 1921, and was appointed to the staff of the Mayo Foundation in 1928, where he pioneered neurological surgery.[13] Although a renowned surgeon, one of Learmonth's first scientific contributions, in 1924, demonstrated that the AB blood group was inherited in a Mendelian manner. In August 1945, Markowitz commented how this was 'an example of what can be done by an intelligent undergraduate.'[14]

Markowitz's time at the Mayo Foundation also led to an extensive series of papers studying the pathophysiological effects of Rattlesnake venom. From this his interest widened to consider not only the role of the liver in such reactions, but also studies of anaphylactic shock, and the role of numerous chemical mediators.

In March 1929 Markowitz married, Cecile Cohen, a medical student at Toronto who graduated that year. Prior to medical training she had studied home economics, and during her summer vacations had volunteered at the Mayo Foundation, where she met Jacob in 1927. Once married, she returned to Rochester with her husband and worked for Mann, publishing papers on the formation of lymph[15] and the response of cardiac muscle to neuroendocrine factors.[16]

Academic promotion

In 1930, Markowitz was appointed Professor of Physiology at Georgetown University, Washington, although he continued to collaborate with colleagues at the Mayo Foundation. In 1933, he co-authored a now seminal paper in the *Archives of Surgery* describing the technique for experimental homotransplantation of the heart.[17] Although the first heart transplantation was undertaken in 1905 by Alexis Carrel, his technique was unphysiological, with aortic outflow passing to the recipient's venous circulation. By contrast, Markowitz ensured aortic outflow to the recipient's arterial system, atrial inflow from the venous system, and a good coronary perfusion by arterial blood. Perfecting the technique in many animals, Markowitz described that 'heart transplantation in the dog was a routine procedure.' He had proposed transplantation in order to study the tachycardia associated with hyperthyroidism in the denervated heart, hoping to identify the role, if any, of the autonomic nervous system. This followed his observations in 1930 of the role of physiological agents on the blood flow and activity of the thyroid gland.[18] In fact, the first description of the technique of transplantation was presented 1931.[19] The *Archives of Surgery* paper of 1933 has come to be cited widely in the literature relating to the history of heart transplantation.[20] Over 20 years later, when working as a surgeon in the Chungkai Hospital on the Burma Railway, Markowitz's patients recalled him as a 'quiet little man, who used to walk about the camp on his own', but that he had been 'the first person in the world to carry out a heart transplant.'[21]

Markowitz's tenure at Georgetown was relatively short-lived. Despite not receiving the financial support he had been promised, he developed good research relations with the Professor of Medicine, WW Yater. However, he surprisingly resigned in 1931. The issue related to academic plagiarism and fraud by a member of university staff, uncovered by him and Yater, and which the institute failed to address in a satisfactory manner. Having resigned, he initially worked as a physician in Washington DC but in 1933 returned to Toronto, where he and Cecile established a medical practice at 220 Boer Street West. At the same time, he was appointed as a research associate in the Department of Physiology, Toronto, where the head of department was now Professor Charles Best.

In 1921 Best, a student at Toronto, was employed by Banting on the programme to isolate insulin. After

receiving half of Banting's Nobel Prize money, Best qualified as a doctor in 1925 and moved to England to undertake a PhD in Sir Henry Dale's laboratories. Returning to Toronto University in 1928, Best succeeded Macleod, and focussed his research on the biology of heparin. Markowitz collaborated with Best and Louis Jaques on studies of anaphylaxis, especially the role of heparin in modulating coagulation.[22] Jaques, a research student of Best, also collaborated with the surgeon Gordon Murray and once heparin became available for clinical use in 1935, Murray developed a range of new techniques for vascular and cardiothoracic surgery. Looking back on his varied experiences in research, Markowitz concluded that 'in scientific work, as in rough mountainous country, progress cannot be made in straight lines.'

Family tragedy and a call to arms

With the outbreak of World War 2, Markowitz was keen to serve his country in the fight against the Nazis. Cecile Markowitz died from ovarian cancer at Toronto's Women's College Hospital on 14 May 1940; she was 44 years old. In the summer of 1940, his efforts to join the Canadian forces were unsuccessful, being turned away with the excuse that he had been born in Romania and did not have Canadian naturalisation papers; only British subjects were allowed to enlist. Markowitz was not alone; of some 43,000 Jews in Toronto, half had been born outside Canada and were ineligible to serve.[23]

He rapidly formed the opinion that this was a further example of anti-Semitism, an observation which he later made to one of us (AWF). Markowitz's plight came to the attention of 'A Man called Intrepid,' whose real name was William Stephenson, a Canadian businessman, from Winnipeg. He was head of the British Security Coordination, effectively Churchill's intelligence organisation in the Americas. Markowitz's determination to serve, along with his ability to speak 'peasant Romanian,' made him stand out and he was recruited as an intelligence officer and sent to England.

Romania, with her enormous oil reserves, had aligned herself with Germany in late 1940, but with the entry of Russia into the war, there was no longer a need for spies like Markowitz. He left the shadowy world of espionage and described how 'I was walking through the streets of London, without a job, when I noticed a British Army Recruiting Office. I decided to try again. They welcomed me immediately into the British Army as a medical officer.' He joined the Royal Army Medical Corps in early 1941, receiving his commission in April that year. Sent to a training centre in Bude, Cornwall he was teased both about his Canadian accent and his appearance, the latter not being typical of a British Army officer.

Markowitz never forgave Canada for denying him the opportunity to wear the maple leaf on his military uniform and from 1941 onwards always referred to himself as British, and only ever carried a British passport. In 1946, he summarised the reason for fighting as 'to establish the sanctity of the human personality; our right of free speech; the right to govern ourselves.'[24] In 1941, his name appeared in the *Medical Register* of the United Kingdom, under the list of temporary registrants. Although desperately keen to serve against the Nazis, he was sent to the Far East on board *SS Dominion Monarch,* one of 35 RAMC doctors, including one of us (AWF). On board, he wrote a letter home, stating that he was 'sailing for the tropics.' Arriving in Singapore on 28 November 1941 he spent some time at the Alexandra Military Hospital, where AWF remembers watching him repair an inguinal hernia. He appeared very sure of himself and was keen to teach the nurses in theatre. He stressed the need to avoid major blood vessels but then inadvertently damaged an artery. Calmly he informed them that 'this is the way in which you repair an artery.'

By 8 December 1941, when the Japanese attacked, Markowitz was serving as a surgical officer attached to No 5 Casualty Clearing Station, Indian Medical Services in northern Malaya. One of the five medical officers, he operated day and night for a month, treating casualties. He recorded how wounds of the buttocks and back were very common, the result of mortar fire. With the Japanese advance, Markowitz's unit was forced to retreat south, during which time he asked his commanding officer whether 'we would have to learn to speak Japanese soon?'[25] Reflecting after the war, he pointed out that the 'British Army is of course the greatest retreating army in the world' and that with the retreat 'we didn't feel too down-hearted; we knew that we were overwhelmed in point of preparedness, strategy and aircraft.' He felt that there was always the chance that they would be rescued, but 'as we ran out of earth, we had no place to retreat, and we surrendered.'

Captivity

Taken prisoner on 15 February 1942 in Singapore, Markowitz was sent to Roberts Barracks at Changi, along with many other RAMC men. Here he was one of the first speakers at the recently established Changi Medical Society, talking on both physiology and on Canada, the latter prompting Captain Jack Ennis RAMC to write that the country sounded a 'lovely place' and would be an ideal destination for him and his wife (imprisoned in the civilian Changi Gaol) after the war.[26] Malnutrition was a significant issue at Changi, and Markowitz noted how he lost 28 lbs in 6 months. He recorded that 'the diet of boys at Squeer's [sic] Institute [from Nicholas Nickleby] seemed splendid compared with ours.'

Many men imprisoned on Singapore were dispatched in working parties to locations in the Far East. The largest deployment was to Thailand and Burma, where men were used as slave labour to construct the infamous Burma

Railway. Medical Officers accompanied working parties and in May 1943 Markowitz, with four other medical officers, arrived at Chungkai Camp, which housed over 7000 men. It was situated 57 km from the southern terminus of the railway and stood on the outskirts of the town of Kanchanaburi. He would later describe the conditions: 'Throw in everything you had at Belsen and you have a pretty good picture of our camp. However, we were allowed to bury our dead.'

On arrival, he was delegated as the camp surgeon by the Japanese doctor. Disease was rife, with men suffering from dysentery, vitamin deficiency and tropical ulcers; nearly 20 men were dying each day. Not unexpectedly, he developed diarrhoea, which led to chronic disease throughout his life. He also encountered the wrath of his captors; when carrying dirty bedpans he failed to salute a Korean guard who immediately struck him across the head so forcefully that he suffered permanent loss of hearing in his right ear.

As camp surgeon, Markowitz found himself with next to no medical supplies or equipment for surgical work. Worrying as to how to treat the sick, he remembered a quotation 'Blood is all things to all…meat to the hungry, blood to the malarious and life-giving fluid to the collapsed.' He decided blood transfusions were needed to 'save the dying and strengthen the weak.' There was, however, an immediate problem; there were no anticoagulants available. Recalling his experimental studies from 20 years earlier, he started to construct a makeshift transfusion set. Soon an emergency arose. A Dutch soldier was unconscious, the result of anaemia due to malaria. After cross-matching with a potential donor, the transfusion took place, with blood being stirred to remove the fibrin. The patient received the blood, opened his eyes, and asked, 'Where am I', followed by 'What am I doing here?' The success of this case was to encourage Markowitz, and others, to use defibrinated blood in some 3800 transfusions in prisoners held on the Burma Railway, itself quite a remarkable feat given the conditions and lack of medical equipment.[27]

In recording his work in the *Journal of the Royal Army Medical Corps* in 1946,[28] he described the issues which had guided the development of such a successful system, referring to contemporaneous notes that he had hidden in a corked bottle. Some 1500 donors were used, all having been free of malaria for three months. Although all British personnel had been blood typed prior to deployment, it was noted that 2% of donors were incorrectly typed. Blood typing and cross-matching was undertaken by macroscopic examination only. The technique of defibrination required donor blood to be stirred with a wooden spatula 'much as one stirs sugar in tea.' Since prisoners were not allowed watches, those stirring were instructed to count to 500. One of those, the artist Jack Chalker, recorded that this took about 5 min.[29] The blood was then strained through a filter of 16 layers of gauze before being administered under gravity over a period of 30 min. The transfusion equipment was washed in well-water immediately after use since they were seldom able to sterilise the equipment.

Indications for transfusions were varied, the most numerous being cases of chronic malaria, dysentery, malnutrition, blackwater fever and those undergoing surgery. Interestingly he recorded that one patient with aplastic anaemia received 20 transfusions. Haemolysis of blood after transfusion was noted, often after administering just 50 mL, and this was believed to be 'malarial paroxysm.' Overall the reaction rate to transfusion was recorded as 13%. In reporting 250 patients receiving blood transfusions at Chungkai in 1943–1944, he noted that 41% were 'improved,' 20% 'much improved' and that 36% died, although the majority of the latter were very ill at the time of transfusion.

The 1946 paper, although extensive in detail, might be viewed as lacking in respect of the background. His published paper is a shortened version of the full paper, itself written on 29 August 1945 at Nakom Paton, Thailand. In this he wrote a full introduction to the subject of blood transfusion, and quite remarkably, given his circumstances, made reference to published work in the field stretching back 300 years. He referred to Pepys' observations on blood transfusion in the dog demonstrated at the Royal Society (in November 1666), and then outlined how it became applicable to human medicine after the work of Landsteiner, and then Lewisohn's introduction of sodium citrate in World War 1. Referring to Starling and Verney's investigations of the toxic effects of defibrinated blood, he also provided detailed reference to work by Jaques at Toronto on the effects of heparin, work which he had been involved with. He recognised that defibrinated blood was no longer used clinically due to the inconvenience and frequent adverse effects. It is testament to Markowitz's remarkable abilities that he could write such a clear, detailed and cohesive introduction in the confines of a jungle camp, just a few days after the end of nearly three and a half years of imprisonment.[14]

Markowitz's contributions on the Burma Railway were not restricted to the development of a transfusion service. He reported 100 cases of amputations performed for tropical ulcer, (a condition which he suffered from at one point). Although the first 20 amputations were performed under general anaesthesia, (chloroform and ether), the majority were performed under spinal anaesthesia, using either Percain or Novocain.[30] He was also responsible for managing an outbreak of cholera at Chungkai, affecting nearly 200 men. Developing a technique for intravenous fluid administration, using distilled water with 2% added salt, he reported an overall mortality of 41%.[31] In June 1946, Markowitz was recognised for his work by the

Figure 1. Jacob Markowitz with family, 1908. Courtesy of Thomas Markowitz.

Figure 2. Jacob Markowitz (smallest student) in Anatomy Laboratory. Courtesy of Thomas Markowitz.

award of the MBE (Military) in recognition of 'gallant and distinguished services while a prisoner of war.'

After the war

Following the end of the war, Markowitz returned home, sailing on the *SS Orbita* to arrive at Liverpool on 9 November 1945. He visited Canada House in London in order to obtain an Identity Certificate, as a foreign-born Canadian he required this to re-enter Canada. He recalled

Figure 3. Lieutenant Jacob Markowitz, RAMC, 1941. Courtesy of Thomas Markowitz.

Figure 4. Jacob Markowitz receiving MBE from Viscount Alexander, June 1946. Courtesy of Thomas Markowitz.

how, 'I was walking through the streets of London, wearing my Captain's uniform, when I saw a Rolls-Royce limousine, with a Canadian flag on the front bumper. I saluted the flag. The Rolls stopped. Vincent Massey, the Canadian High Commissioner in the UK, came out of the Rolls and shook my hand. "I just wanted to thank you, Dr. Markowitz."'

Returning to Canada he married his fiancée, Ruth McCullough of Kincardine, Ontario, on 12 January 1946. She had joined the Wrens shortly after he had been reported missing, and on his return commented 'I knew he'd turn up, and he's done it.' They subsequently had two children. He returned to the University of Toronto, and continued to teach physiology and experimental surgery, influencing many students from a range of backgrounds. His research focussed on the circulation of the liver, in both health and disease.[32] Understandably his research output was not as prolific as in the pre-war period, but he continued to edit and update *A Textbook of Experimental Surgery*, first published in 1937.[33] The fifth and final edition was published in 1964, and co-edited with two veterinarians from the Ontario Veterinary College, James Archibald and Harry Downie. At the same time, he ran a family medical practice and was one of the founders of the College of Family Practice (later the Canadian College of Family Physicians).

Jacob's health suffered in the post-war years, undoubtedly the result of his imprisonment. He suffered from depression, nightmares, unresolved anger and fits of rage, but only his immediate family were aware of his suffering. There were other health issues; he suffered from chronic diarrhoea and in 1962 suffered a severe coronary attack forcing him to retire from the University in 1963. The following years have been described as a 'slow painful death,' until on 29 January 1969, he died of heart failure.

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Author biographies

PE Watkins is a veterinary surgeon with a long-standing interest in medical and military history.

AW Frankland, MBE, qualified from St Mary's Hospital in 1938, was House Physician to Sir Charles Wilson and served with the RAMC from 1939 to 1946. He was taken prisoner on 15 February 1942 at the Fall of Singapore, and held captive for over three years. On returning to the UK after the war, he was Clinical Assistant to Sir Alexander Fleming and was instrumental in developing the field of clinical allergy.

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Giovanni Rajberti (1805–1861): An uncompromising physician and poet

Iulia Petria, Giancarlo Cesana and Michele A Riva

Abstract

The aim of this paper is to describe the figure of the Italian uncompromising physician and poet Giovanni Rajberti (1805–1861), who was a strenuous opponent of non-scientific medical practices in Italy, including Animal Magnetism, Homeopathy and Hydropathy. In particular, he demonstrated the inconsistency of mesmerist practices in an exemplary yet less-known episode that involved the famous French writer Honoré de Balzac (1799–1850). Although his ideas hindered his career, Rajberti continued to criticize alternative practices, sustaining the value of true medicine and science against charlatans.

Keywords

Giovanni Rajberti, Homeopathy, Mesmerism, Hydropathy, Honoré de Balzac, 19th century, Italy

Giovanni Rajberti: A physician–poet

Giovanni Rajberti (Figure 1) was born in Milan on the 18 April 1805 into a noble family.[1] His ancestors were originally from Nice, but his great grandfather had moved to Lombardy as a doctor. Among Rajberti's relatives were other physicians, a state diplomat and a professor at Montpellier University. At the time of Giovanni's birth, however, the family's wealth and social status were less than they had once been.

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