

Ogston the Bacteriologist

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I wish to deal with the five years, 1877 to 1882, when Ogston was actively pursuing research on the role of micrococci in acute inflammatory states. During this period he isolated and named the staphylococcus. Since he was primarily interested in the pathogenic effects, he chose the name *Staphylococcus pyogenes*.

In order to set out this discovery it is necessary to touch on some aspects of Ogston's training, to consider the contemporary state of knowledge anent bacteria pathogenic to man and to define what was known of the aetiology of acute inflammatory disease. Since Ogston confined his research mainly to the micrococci and to the clinical conditions of abscesses, septicæmia and pyæmia which they may cause, such a review can be relatively brief yet comprehensive.

First I must record his facility with languages, in particular with the German tongue. This gift was encouraged by his father, Professor Francis Ogston, who arranged for his enrolment during the clinical years of his course in medicine as 'an inscribed extraordinary student' in Prague, Vienna and Berlin with visits to Paris and other centres. Thus Alexander Ogston attended lecture courses by many of the most eminent medical men of the time—Hyrtyl, E. Gregor Jr, Oppolzer, Brücke, Rokitansky, Sigmund, Hebra and Türck. While in Berlin, he attended classes by Albert V. Graefe, Virchow, Kuhne and Langenbeck and in Paris by Maisonneuve and Richet.

After graduating from the University of Aberdeen in 1864 and proceeding to the MD in 1865, he continued to travel, maintaining contact not only with the European medical literature but also with individuals and professional societies, mainly surgical. He was a member of the German Surgical Congress and thought most highly of its originator and perpetual President, Von Langenbeck. Indeed in later years he grouped Langenbeck, Lister and Paget as the three most outstanding individuals in the surgical hierarchy. Clearly he had a direct line of communication with the recent

advances in both German and French medicine at the period which interests us.

After graduation Ogston showed increasing interest in surgery. In 1870, at the age of 26 years, he was appointed junior surgeon to Aberdeen Royal Infirmary. Lister had transferred to Edinburgh from the Regius Chair in Glasgow in the autumn of the preceding year and Ogston went to see at first hand the results of the new antiseptic method of wound treatment. This was followed by a visit with Hector Cameron, Lister's former assistant and successor in the Chair of Surgery at Glasgow Royal Infirmary. Five minutes with Hector Cameron sufficed to convince Ogston of the truth of the claims for the antiseptic system of surgery, 'I was shown a knee-joint which had been opened and, after instruction, was allowed to handle and examine it. There could be no room for doubt. The wound made into the joint was there, but where was the inflammation that ought fatally to have followed? There was none. The limb was perfectly well, the wound clean and healing, and not a trace visible of what I would have deemed to be the inevitable. I was shown other cases, but that first was sufficient. I saw that a miraculous change had come over our Science, and my mind was almost bewildered with the glorious visions of all that it entailed. I felt inclined to sit down, cover my face with my hands, and think out what the great revelation implied in the future.'

The Pauline overtones of this scene should not escape us. The more immediate results were visible in the facility which Ogston demonstrated in operating upon bones and joints. Indeed Ogston and later Macewen were pioneers in orthopaedic surgery, building on Lister's work. In April 1877 he gave a paper to the Deutsche Gesellschaft für Chirurgie entitled 'Zur operativen Behandlung von Genu valgum'.

When aged 30, in June 1874, he was appointed full surgeon to the Royal Infirmary and in 1880 became senior surgeon. Still at an age when many produce their most original work, it is likely that Ogston would not be content with mechanically following the Listerian principle without further enquiry into the causes of contamination and septic inflammation of wounds. Particularly is this probable since he was aware of the controversy taking place and reported, especially in the French and German Literature, as to the role, if any, which microorganisms played in human diseases and whether there were specific organisms for specific diseases.

What was the state of the emerging science of bacteriology at this period? On the one hand, the theory of heterogenesis was not dead. One of its most ardent protagonists, Professor Charlton Bastian maintained that microorganisms might arise by changes in the protoplasm of degenerating tissues. At the other end of the spectrum shone the genius of Ferdinand Cohn who

in 1872, while Professor of Botany at Breslau, showed that bacteria could be arranged in genera and species and suggested the division into 4 groups (Tribus) each containing one or more genera. Tribus 1 contained the *Sphaerobacteria* with the genus of *Micrococci* which in turn were speciated into chromogenic, zymogenic and pathogenic. Just as the doctrine of spontaneous generation was a long time dying so the pleomorphic theory of bacteria lingered until 1885 or later, numbering among its adherents, Huxley (1870), Lister (1873), Ray Lankester (1873), Klebs (1873, 1881), Billroth (1874), Warming (1875), Cienowski (1877), Nägeli (1877), Zopf (1879–85) and Metchnikoff (1888). Billroth, credited with the discovery of the *Streptococcus* was a most ardent protagonist, maintaining that all the round and rod shaped forms of bacteria in putrid materials were but stages of a plant which he called *Coccobacteria septica* (1874, 1876). While Cohn's classical paper of 1875 pointed out the defects of Billroth's work, many, including Billroth, continued to pursue this concept of pleomorphism. Thus in June 1878 we find Huxley reading a paper by J. Cossar Ewart in which it is stated 'Hence, having failed to find *Micrococcus* developing into Bacterial rods, it may, in the meantime, be inferred that it is a distinct form: or just as *Torula* may be an arrested phase of some *Penicillium*-like organism, so may *Micrococcus* be the spore of a *Bacterium* which has either altogether lost its power to germinate, or can only do so under very peculiar conditions', and in the same paper 'led me to conclude . . . that Billroth was probably right in believing that *Micrococci* were the spores of ordinary *Bacteria*'.

The concept of specific organisms for specific diseases was emerging from the work of a few individuals, especially Pasteur with his experiences of chicken cholera and charbon, but for the most part the concept of bacterial disease in man was most confused, indeed chaotic. Particularly was this so in the conditions described as septic infection, pyaemia and septicaemia. A committee had been appointed by the Pathological Society of London to 'investigate the nature and causes of those infective diseases known as pyaemia, septicaemia and purulent infection'. Their report, which appeared in 1879, reveals how incomplete knowledge was and how discordant the views were on the nature and causes of these diseases. In the 188 pages of the report there is no indication of the role played by micrococci in the pathogenesis of inflammatory disease.

In this same year of 1879 it is worthwhile pausing to consider Lister's views on the relationship of bacteria to acute inflammation, sepsis of wounds and so on. For this purpose I have had recourse to the writings of Watson Cheyne who, after becoming Lister's house surgeon in 1876, embarked, the following year on an investigation designed to elucidate the

reasons why the antiseptic treatment of wounds had been so successful. The results, published in 1879 under the title of 'On the relation of organisms to antiseptic dressings', may be summarized as showing that where the antiseptic treatment was properly carried out organisms were either completely absent from the wounds or if present they belonged to the class of micrococci.

While micrococci give but little indication of their presence, the entrance of bacteria is generally accompanied by the development of smell or by symptoms of local or constitutional disturbance.

Micrococci are quite distinct from bacteria and under careful observation over 18 months one form has not been noticed to change into the other.

Ordinary forms of micrococci, whenever derived, are harmless, whether they be introduced into the veins, under the skin or inoculated on the cornea (of a healthy animal—rabbit). Organisms do not occur in the blood or tissues of a healthy living animal, though they may be present in states of disease, as in acute inflammatory processes . . . : they are not essential for the inflammatory process, however much it may be complicated by their presence . . . : the explanation for their presence in wounds is that the discharge flowing from underneath an antiseptic dressing is not too strongly antiseptic to prevent the development of organisms in it . . . : the organisms which find it the most suitable pabulum are the micrococci, and these, as they continue to grow in it, become stronger, and able to grow in fluids containing more carbolic acid . . . : this seems to be their ordinary mode of entrance though they may possibly in some cases come from the blood. But not only are micrococci obtained from aseptic wounds harmless, micrococci got from the air, from tap water, from unopened abscesses, indeed from rabbits themselves . . . have proved in like manner innocuous.

These views continued to be promulgated both by Lister and Watson Cheyne for some years and indeed were reiterated by Lister in his lecture on the 'Relation of Micro Organisms to Inflammation' in August 1881. In the same paper he criticized Ogston's paper of March of that year in which Ogston had shown that micrococci played the central pathogenic role in the aetiology of some, indeed the majority, of acute purulent infections and that these in turn could give rise to septicaemia and pyaemia. Lister's view is best illustrated by the following passage. 'Hence I am disposed to regard the view which has been taken of this matter by Mr. Cheyne as the one most consistent with the present state of our knowledge—viz., that the micrococci are, so to speak, a mere accident of these acute abscesses, and that their introduction depends on the system being disordered.'

Cheyne's view of the benign nature of micrococci as mere contaminants was not shared by many other workers. Hueter, v. Recklinghausen, Lukomsky and others had isolated micrococci from the margin of erysipelas

and believed that they caused the disease. Others found micrococci in the peritoneal fluid of puerperal peritonitis while micrococcal endocarditis had been described by Heiberg and Eberth. Birch Hirschfeld went even further and gave the essential role of pathogenesis to the micrococci even when other bacterial forms were also present. In all, however, proof was lacking.

Even more extraordinary are Watson Cheyne's views on the benign nature of micrococci since it was he who had translated Koch's monograph on the Aetiology of Traumatic Infective Diseases into English for the New Sydenham Society in 1880. The original of 'Untersuchungen über die Aetiologie der Wundinfektionskrankheiten' appeared in 1878. Koch's reputation as a bacteriologist had already been established by his work on 'The Aetiology of Anthrax based on the Developmental Cycle of *Bacillus anthracis*', published in 1876, 3 weeks after his initial presentation of the results to Cohn at Breslau. In his second bacteriological research, Koch (1877) set out his greatly improved methods of staining and photographing bacteria, which laid the foundations of present day techniques.

Koch's 1878 monograph of only 80 pages, outlines the methodology used for the study of 6 traumatic infective diseases produced by the injection of putrid fluids into small animals—rabbits and mice. The object was to determine whether infective diseases of wounds were of parasitic origin or not. He was able to show in a manner amounting almost to proof that 5 out of 6 separate diseases which differed clinically, anatomically and aetiologicaly could be produced experimentally by the injection of putrid fluids into animals. He believed that the infection was produced by such small quantities of blood, serum or pus that the results could not be attributed merely to a chemical poison. In the materials used for inoculation, bacteria were without exception present and in each type of disease produced, a different and well marked form of organism could be demonstrated. He concluded that every individual infective disease or group of closely allied diseases must be investigated for itself. He clearly subscribed to the concept of specific diseases caused by specific organisms.

In the preface Koch states that due to extraneous circumstances, he found it necessary to confine himself solely to experiments on the action of putrid materials in animals—'which experiments had not unimportant results, nevertheless, in order to obtain a complete answer to the question, it would have been necessary to carry out a further series of similar experiments on animals with materials obtained from persons suffering from, or who had died of, traumatic diseases (septicaemia, pyaemia, progressive suppuration, gangrene and erysipelas) and—what indeed seems to me to be the most important, to look for microorganisms in the human body, by the method described in this work'.

Ogston did precisely this. He published his initial results in the communication 'Ueber Abscesse' in April 1880, amplifying them in the 'Report upon Micro-organisms in Surgical Diseases' in March 1881.

It is interesting to consider how much Ogston developed his own methods and how much he took from Koch. Since the latter published in 1878 it is possible that the monograph formed the stimulus of this research. But for various reasons I believe that Ogston's work on micrococci and indeed some work carried out by Pasteur and published also in 1880 were independent but contemporaneous with that of Koch.

Confining the enquiry to Ogston for the present, there seems little doubt that as far as histological techniques, fixation, staining and microscopy are concerned these were modelled on those of Koch, probably from the 1877 paper already referred to in which Koch states 'how many incomplete and false observations might have remained unpublished instead of swelling the bacterial literature into a turbid stream, if investigators had checked their preparations with each other'. This sentiment is echoed in Ogston's papers. His use of the wild brown and the white mouse may derive from Koch's choice of the field and the house mouse, a happy choice since it allowed for the separation of streptococci from other bacteria in mixed inocula.

Reminiscing about the period, Ogston wrote in 1920 that the more often he meditated on the subject of acute inflammation, acute suppuration and blood poisoning after wounds and operations, the more he became convinced that there was a single cause and that this cause was some special germ. 'But it was some time before it was possible for me to verify this conviction. At length I came across a case of disease which promised to solve the problem.'

He had to attend a young man, James Davidson, suffering from 'an extensive suppurating phlegmon of the leg almost erysipelatoid in its character though not erysipelas. Procuring a clean phial, I evacuated into it the matter from the phlegmon through the unbroken skin, proceeded home with it, and placed a little of the pus under an ordinary students' microscope fitted with a quarter inch objective. My delight may be conceived when there were revealed to me beautiful tangles, tufts and chains of round organisms in great numbers, which stood out clear and distinct among the pus cells and debris, all stained with the aniline violet solution I had employed to render them more distinct. The pus on the microscope slide, which appeared to indicate the solution of a great puzzle, filled me with hope.'

He next related how he had to make sure that the organisms which he found in Mr Davidson's leg 'were not there as mere coincidence but would be found in every acute suppuration'. This research forms the basis for

'Ueber Abscesse'. The investigation was carried out on 88 cases of abscesses, 70 of which were acute, while 4 others were less acute. In all micrococci were found. The remaining 14 were cold abscesses originating from caseous processes in bones or lymph nodes and in these he could not discover organisms even after attempts at culture. Assuming that the paper was translated and the camera lucida drawings were made in the new year of 1880, it is almost certain, from local sources, that the last case of the series was examined in December of 1879. In the same paper he also included other investigations on acute suppuration generally which did not come into the category of abscesses and on the bacterial content of pathological accumulations and fluids and blood. He states that micrococci never occur unless inflammation and pus formation has taken place. He confirmed this with direct microscopy, culture and animal inoculations using suitable controls. He had also examined a considerable series of infective processes in the body, gonorrhoea, pustules, etc. and whenever suppuration could be called in any sense acute, micrococci were observed. Lastly he found micrococci in the wound and in the blood of a fatal case of septicaemia following partial thyroidectomy on a male patient. This we can date to December 1879 from clinical records.

If we now add to the direct examination of pus and bacteria, the haemocytometer studies for assessing the number of cocci present in pus samples, the morphological studies on the shape and the method of fission of the cocci—he clearly showed the chain or necklace-like cocci and the clusters like bunches of grapes (*Weintraubenartig*) which divided in a different fashion. He demonstrated mixed infections and noted on two occasions the presence of spirilla and fusiform bacilli later associated with Vincent's Angina.

In addition he conducted 68 inoculations of guinea pigs, wild mice and white mice and showed that the micrococci caused abscesses, while pus from cold abscesses did not. Further, pus containing micrococci did not cause abscesses if it was previously treated with phenol or heated. He also observed that while a certain dose of micrococci would produce symptoms of blood poisoning in mice, a much smaller dose might only give a local reaction. Even among litter mates, injected with identical doses, differing resistance to infection seemed to be naturally present. He also noted that there were micrococci which did not have the property of causing suppuration, this based on a series of 86 examinations of wounds.

Also in the paper were details, subsequently expanded in his 1881 Report, of attempts to isolate pure strains and to culture these. The use of inoculation of fresh eggs and their subsequent incubation to obtain pure cultures of staphylococci appears to have been his own discovery which he

shared with his friend, Patrick Manson who in 1879 in Amoy was using the technique in an attempt to grow bacteria from cases of leprosy (Porter 1970). It is important to note this since Koch, in the first number of the 'Mitteilungen aus dem Kaiserlichen Gesundheitsamte' in 1881, stressed the desirability of devising methods to obtain pure cultures in his paper 'Zur Untersuchung von pathogenen Organismen'.

Using such cultures Ogston repeatedly showed that on subsequent inoculations into guinea pigs and white mice abscesses resulted and the pus therefrom contained the same kinds of micrococci. He was thus satisfying what have subsequently been habitually but erroneously referred to as Koch's Postulates but which were clearly set out by one of his teachers, Jacob Henle, in 'Pathologischen Untersuchungen' dated 1840.

It appears that Theodore Kocher of Berne may have influenced Ogston's thoughts on the nature of septicaemia and pyaemia. Ogston contended that they were states consequent on the growth of local foci of pathogenic micrococci and originated from a local source. Septicaemia and pyaemia were not 'blood' diseases as was generally held at that time. This he clearly demonstrated in his paper on 'Micrococcus Poisoning' (1882) maintaining that the blood was merely the vehicle for dissemination of the micrococci in the body. Variations in the course and mode of termination in infective processes were brought about by differences in the organisms, the organ or structures involved and the susceptibility of the individual affected.

This proved to be the correct interpretation of the observed facts and the first indication of Kocher's influence occurs at the end of 'Ueber Abscesse' when he says, 'I cannot do better than conclude with Kocher's words, There is only a difference of degree, a quantitative difference between a simple localized acute inflammation and cases of the most acute pyaemia.' This quotation comes from a paper in Langenbeck's Archives for Clinical Surgery of 1879, the year when Ogston must have finished his paper, ready for the 9th Congress of the German Surgical Society on 9 April 1880. I think that it is completely out of character for him to put this quotation almost as a postscriptum to his 1880 article. It could be that he was much impressed by the fatal septicaemia following the partial thyroidectomy in December 1879 and that this in turn took him to Kocher's article of the same year.

While the sudden revelation was not unknown to him, his appearance before the august German Surgical Society at the tender age of 35 years would have tended to constrain him from setting down any such flash of inspiration. Much more likely is the possibility that Ogston and Kocher met at the 7th Congress in April 1878 when the latter delivered a paper entitled 'Zur Aetiologie der acuten Entzündungen', the probability that Ogston was there is high since there were two papers, one by Riedinger and another by

Thiersch on Ogston's operative treatment for knock knee—you will recall he had described his operation and results at the 6th meeting in April 1877.

I have laboured this a little but it helps us to date the work more firmly as being done mainly between 1877 and 1879 rather than in the unrealistically short time between 6 August 1879, when it is recorded in the Minutes of the Scientific Grants Committee of the British Medical Association that a grant of £50 be made to Dr Ogston, 'For a research into the Relation between Bacteria and Surgical Disease', and the end of that year. Even to the end of March 1880 would be only 8 months. The beginning of the work must be later than 1876 when the Act was passed enabling premises to be licenced for animal work. (Ogston had built a small laboratory behind his house and applied for a licence.) Unfortunately the policy is to destroy licences which have lapsed, after 10 years and there is no help forthcoming from that source.

Another indication that the work reported in 'Ueber Abscesse' must have extended over a period of years is the simple fact that Ogston reports on 88 cases of abscess. For the year ending December 1879 the Annual Report of the Royal Infirmary of Aberdeen contains only 42 abscesses of both acute and cold types.

Whereas the 1880 paper was widely accepted in Germany, the Report of March 1881 was poorly received in Britain. There is evidence of a reaction ranging from disbelief to incredulity among his senior colleagues in Aberdeen late in 1879. Indeed this may have induced him to make the correct choice of a forum for his initial paper. Even his hero Lister was very critical of the Report during his address to the International Medical Congress in August of 1881, while the editor of the *British Medical Journal*, in which it had appeared, refused to publish any more of Ogston's papers. The final paper entitled 'Micrococcus Poisoning' (1882) appeared in the *Journal of Anatomy and Physiology*. Of the 75 pages, the first 21 are devoted to answering all the points of adverse criticism which had accumulated since March 1881. The flow of prose is in the highest tradition of late Victorian polemics starting with a muted passage, 'It appears that the brevity that was studiously aimed at in the former report (1881) had prevented full justice being done to the views regarding inflammation and here given out. . . .' He proceeds to pick off each and every opponent including Mr Lister in an altogether charming and penetrating fashion—and time has shown the correctness of his replies.

Also in this paper he calls the micrococcus in grape-like bunches the *Staphylococcus* and shows that it produces disease states with different presentations from those of the *Streptococcus*. He also notes that the pathogenic forms of staphylococci cause coagulation of plasma and may produce yellow or orange pigment under various conditions of cultivation.

There is evidence of much thought, as one would expect from an active practical surgeon, on how the organisms are distributed both on various areas of the surface of the body and in the gastro-intestinal tract in man, how they invade the body tissues and how best the patient may be prepared for surgery (Smith 1979). The approach selected is the modern concept using a combination of both antiseptic and aseptic methods—

The present is an epoch when it seems somewhat unfashionable to be a thorough antiseptician in theory and practice, when such words as bacteria and carbolic acid have become commonplace and vulgar, and when there is danger of reaction carrying us back towards our aimlessness in treatment.

Human nature forgets unseen foes, but were every surgeon and physician familiar with the microscopic study of micro-organisms, then, dealing as we would with visible realities, and beholding both our faults and their punishment, in the treatment of wounds and disease, it would be less easy for fashion to mislead or prejudice to warp our minds.

A review of this period would be incomplete without consideration of Pasteur's work on acute bacterial inflammation in man. From his contemporary writings he was becoming more and more involved in medical bacteriology—'étranger aux connaissances médicales et vétérinaires' (1877), 'si j'avais l'honneur d'être chirurgien' (1878). This medical interest is confirmed in the penultimate paragraph of his paper 'De l'extension de la théorie des germes à l'étiologie de quelques maladies communes' (*C. R. Acad. Sci.* (Paris, 1880), **90**, 1033–44). '. . . mais je ne me dissimule pas que, sur le terrain médicale, il est difficile de se soustraire entièrement à des préoccupations subjectives; je n'oublie pas davantage que la Médecine et la Vétérinaire me sont étrangères'. In this paper dated 3 May 1880 he gives the results of his studies on 2 cases of recurrent furuncles, one of osteomyelitis and 6 of puerpural fever. For the first, 'en résumé, il paraît certain que tout furoncle renferme un parasite microscopique aérobie et que c'est à lui que sont dues l'inflammation locale et la formation du pus qui en est la conséquence'.

In the case of acute osteomyelitis he obtained from the pus at operation an organism similar to that found in the furuncles—'Si j'osais m'exprimer ainsi, je dirais que dans ce cas, tout au moins, l'ostéomyélite a été un furoncle de la moelle de l'os'. In 6 cases of puerpural fever he isolated organisms resembling those found in furuncles but distinguishable from them by being 'en longs chapelets—et souvent en petits paquets enchevêtrés, comme des fils de perles brouillés'.

He too was on the trail of the pathogenic micrococci but for some reason did not use this term preferring to write about 'le petit organisme des furuncles', 'les longs chapelets de grains' and 'le petit vibrion pyogénique'.

This latter he had named 'L'organisme du pus' in the Note 'La théorie des germes et ses application à la Médecine et à la Chirurgie', dated 30 April 1878. Rindfleisch in 1866 appears to have been the first to find bacteria in the organs of those dying from traumatic infective diseases—pyaemia, puerperal fever and so on. He called but did not especially describe the organism 'Vibriones'.

Thus by 1880 Koch, Ogston and Pasteur were solving some of the problems posed by acute pyogenic bacterial inflammation in man and caused by micrococci. Ogston clearly was out in front. In July 1880 Koch left his general practice as Kriesphysicus in Woolstein, Posen, to go as head of the bacteriology division—a small single windowed room—at the Imperial Health Office in Berlin; Pasteur became increasingly involved in medical bacteriology, especially of cholera and rabies, this last culminating in the opening of the Pasteur Institute in 1888. Ogston in 1882 became Regius Professor of Surgery in the University of Aberdeen and his studies in bacteriology ceased—'the limited time and opportunities I possessed, in the midst of a big surgical practice proved to be impediments which were insuperable for me and I had to leave to others, more fortunately situated, the pursuit of further enquiries'. In the few years, 1877 to 1882, Ogston had accomplished much in the new field of Medical Bacteriology.

Thus Sir Rickman John Godlee, writing in 1913 about the development of antiseptic surgery stated:

Further north, at Aberdeen, Ogston who is still an ornament to his profession, grasped the idea as a young man, and, having no deep-rooted prejudice to overcome, worked at the subject bacteriologically and practically, and made many consequent improvements in the art of surgery.

Later, in 1929, the year Ogston died, one of his former students, William Bulloch, Professor of Bacteriology at London Hospital Medical College, wrote a more accurate appraisal of the value of Ogston's work in the field of bacteriology:

As the science of pathogenic bacteria was gradually emerging between 1876 and 1886 almost nothing was done on the subject in England. France and Germany were very active and the technical methods of Koch were leading to a marvellous harvest of results. Apart from David Bruce's discovery of the agent of Malta Fever—and that was at a later date—Alexander Ogston was the only worker in England who now finds a permanent place in the history of pathogenic bacteriology in its classical period . . . the man who correctly interpreted 'the aetiology of acute suppurative processes in man'.

At the risk of appearing churlish, provided the last 'England' in the preceding paragraph is changed to United Kingdom, I would not disagree with Professor Bulloch's assessment.

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Sir Alexander Ogston and the Royal Army Medical Corps

James Baird

It is a privilege to pay tribute to Alexander Ogston for his surgical work in the Army Medical Services and for his great influence upon the development of military surgery, the care of sick and wounded in battle, and upon the very foundation of the Royal Army Medical Corps in 1898. It is fitting that Ogston's place in military annals be remembered in his own University which has played, through its graduates, such a great part in military medicine. Among them, James McGrigor, Director General of the Army Medical Department 1815–51, was considered to be the greatest military doctor of all time, and was described by Wellington, with soldierly lack of grammar, as 'one of the most industrious, able and successful public servants I have ever met with' (Cantlie, 1974). James Wylie was for twenty-five years the head of the Army Medical Department in Russia being appointed in 1811. He founded the Medical Academy of St Petersburg and Moscow, and was president for thirty years. He was physician to several Czars and at the Battle of Borodino in 1812 is said to have performed over 200 operations on the field (Comrie, 1932). In the First World War, Gordon Taylor, another Aberdeen graduate, was recognized as a superb operating surgeon and Robert Stephen, lately consultant surgeon to the Army, at the beginning of the Second World War, taught the principles of the surgery of war wounds, which had been forgotten or never learned, and which are accepted everywhere today.

OGSTON'S WRITINGS AND CAMPAIGNS

Alexander Ogston was a man with a fluent pen and wonderful descriptive powers, who kept a detailed diary during his Army service. From the diaries

he wrote his fascinating book *Reminiscences of Three Campaigns* published in 1919. I have drawn freely from this book. The delightful paper by Dr Ian Porter presented in 1970 before the Scottish Society of the History of Medicine has also been most helpful. I have in addition consulted Comrie's *History of Scottish Medicine* (1932) and Neil Cantlie's *A History of the Army Medical Department* (1974).

Early history

Ogston had always been fascinated by military surgery and felt that he really must learn about the practical aspects of the subject. He was intrigued by the accounts of the Franco-Prussian War of 1870-71 which directed his attention to this very specialized subject. He refers to the times of Napoleon I and Barons Larry and Percy, when the French Army introduced (1792) the 'ambulances volantes' and the 'brancardiers' to rescue the war-wounded. These were the 'field ambulances' and specialized 'stretcher-bearers' of modern times. In the British Army, sixty years later at the time of the disastrous Crimean War we had no such field medical organization, but the French had, and the shocking comparison between the quality of care for the wounded of the two armies is known to all and is detailed by Cantlie. Modern military surgery really originated in the 1860s and 1870s. Dunant and Moynier, the two great Swiss founders of the Red Cross, appealed for mercy to the wounded and for protection to those who cared for them. The dreadful carnage and gross neglect of the wounded after the Battle of Solferino in 1859 was brought to the attention of all so-called civilized countries of Europe, leading to the signing of the Geneva Convention in 1864. In this country strong sympathy and support were aroused for the Swiss, enhanced no doubt by memories of the medical scandals and disasters suffered in the Crimean War. In north-east Scotland the determination to assist and train civilians to help the injured, resulted in the formation of the Aberdeen Ambulance Association which 'for patriotic reasons' later fused with the St Andrews Ambulance Association, the Society which we know today.

The Volunteer Bearer Companies of Medical Schools were the forerunners of the Medical OTCs and the RAMC Territorial Army as we know them. One Dublin and two Aberdeen graduates led this movement throughout the country—Surgeons Major George Evatt and Peter Shepherd with James Cantlie. Shepherd's brilliant career ended tragically a few years later (1879) at the disastrous defeat and massacre of our troops by the Zulu under King Cetewayo at Isandhlwana, when he was killed while rescuing a wounded comrade. The two others encouraged the raising of the companies

in Aberdeen University and the redoubtable James Cantlie himself founded those in Charing Cross Medical School in London.

Ogston strongly supported the formation and training of the bearer companies with Alexander Macgregor, and developed, in his own words, '... large and enthusiastic units of high efficiency which embraced the flower of our medical students'. Ogston also supported Cantlie in his battles for recognition of this new volunteer reserve for the Army, and although the two were rivals for the Chair of Surgery in Aberdeen in 1882 they seem to have remained good friends in spite of Ogston's success. Cantlie was invited to Aberdeen by the new incumbent in surgery whose warm support for the infant Volunteer Medical Staff Corps, developed from the bearer companies by 1883, helped to ensure its official recognition in 1885 by the War Office. During all these endeavours Ogston, who had to teach military surgery to such keen young men, felt deeply his lack of practical knowledge of the subject. Conscientious and dedicated he determined to take part in active military operations and an early opportunity arose in the Sudan, during the Egyptian War of 1884–5.

Egyptian War 1884–1885

Britain had been involved in the affairs of Egypt and the Sudan since 1882, and this continued intermittently until 1898. There had been rebellion in and a military 'coup' by the Egyptian Army, and Tewfik the Khedive was practically held hostage—this has a modern ring. The British and French Navies attacked the rebels and landed troops at Alexandria. Another purely British force landed at Ismailia to march on Cairo. In the meantime the Sudan was in revolt and under the control of tribesmen led by a Muslim prophet, the Mahdi—a nineteenth century Ayatollah! These rebel forces had massacred an Egyptian Army led by General Hicks at El Obeid near Khartoum. The Arabs of the Red Sea coast revolted in support and destroyed the Egyptian garrisons and armies. Khartoum fell and General Gordon was murdered. A slow moving relief force marched up the Nile and another force landed at the Red Sea ports of Trinkitat and Suakin to deal with the revolt, and to attack across the desert to the river Nile at Berber. Ogston was unable to join the Nile force based at Cairo, but managed to get authority from the Director General to join the Red Sea force—at his own expense. Under the command of General Sir Gerald Graham, some 12,000 men were as he relates 'to be equipped among other things with all the most up to date appliances for the sick and wounded, including field hospitals, bearer companies, and materials for dealing with the difficulties that might be met with under any conceivable eventualities'.

Ogston had an adventurous journey across Europe and the Mediterranean, including a chance meeting in Cairo with a fellow Aberdonian James Beattie, in command of the hospital at the Citadel, needless to say in Shephard's Hotel. Through Beattie's influence Ogston joined SS *Ganges*, the newest, largest and finest vessel of the P & O fleet which had been converted to a hospital ship.

Ogston describes in detail this splendidly equipped ship and efficient well-trained medical staff. He landed at Suakin after several days of comfortable travel to join the Field Army in camp in the desert under very different circumstances. He was warmly welcomed by the medical staff and the PMO himself took him to meet the General Staff, and promised to arrange about tent, rations and, though hard to obtain, a horse and saddlery. (Ogston was struck here as in other campaigns by 'the British way to locate the hospital contingent in the more exposed and dangerous quarters of the Camp'.) He and his servant Mohammed were attached to the First Bearer Company for the Battle of Hasheen due to commence the next day. The promised horse and saddlery did not materialize, so our hero marched with the foot-soldiers, not a whit dismayed, but thrilled at the prospect of battle and carefully observing and recording all that went on in his diaries. There were disappointments, the appearance of the troops was as he says

. . . instead of the clean, trim uniforms, handsome war array and music to which one was used at home, nearly all the British troops were clad in the then uncommon brown cotton (khaki), dirty and worn untidily as the men pleased, with unshaven chins and unwashed faces, set off by occasional blue spectacles. The rough men and badly groomed horses conveyed something of the impression of a lot of day labourers rather than of soldiers.

The Indians were much more impressive and he was astonished to note among the Guards contingent

a stout old gentlemen in plain clothes on horseback, said to be Lord A. . . , a former Colonel of the Guards who had defied all considerations of age and prudence in order to accompany his beloved regiment to the field.

During the ensuing battle Ogston attended the wounded and with a sense of public relations, as we would now say, he was sketched by one of the war correspondents, kneeling beside a badly wounded officer—the sketch appearing afterwards in one of the London illustrated papers. He studied carefully the organization of the collection and evacuation of the wounded from where they fell to the base hospital and on to the hospital ship *Ganges*. He was especially fascinated by the transport used—the Indian doolie bearers, the ambulance wagons, the camel and mule 'cacolets' and litters were new to him and under command of his (and our) old friend Evatt. This

critical observer and ardent reformer later became Surgeon General Sir George Evatt. He had already analysed the tactical problems of bearer companies, and drew up a new field organization and development first used at Suakin. It has a strangely modern ring and will be familiar to many. Ogston does not comment on this, although Cantlie describes it, but busied himself personally trying out carriage in doolies, cacolets, litters and wagons in all sorts of terrain to discover what would be the most comfortable form of transport.

In his studies of the surgical treatment in the base hospitals, he was most impressed by the skill and kindness shown. However, when four nursing sisters (two regulars from Netley and two auxiliaries) appeared and took charge, there was 'something like a revolution' in patient care. 'It was my first introduction to women's work at the front in war' says Ogston, 'and it was a lesson I am not likely to forget.' All of us with battle experience will echo his words.

Ogston was invalided home but was fit enough to be in charge of wounded on board the P & O ship *Deccan* to Suez and finally to the military hospital at Netley. He therefore, followed, observed and tended many seriously wounded men from the field of battle to the home hospital—valuable experience indeed.

Considered impressions

Ogston's conclusions about the Army Medical Service are of great importance as they were to form the basis of the advice which he gave to the Government. His admiration for the quality of the medical officers, non-commissioned officers and nurses was great but he saw clearly that they had not the organization and authority in the military hierarchy and command and the value of their service was not recognized by the War Office or the Nation. Medical officers had no proper rank or powers of command or discipline, as members of the Army Medical Department. The soldier bearers and orderlies of the Medical Staff Corps (previously Army Hospital Corps) were the unfits and throw-outs from the regiments and were not answerable to the doctors. A single corps of officers and men analogous to the rest of the Army was required. The purely medical and surgical equipment he felt was as perfect as could be devised and yet was so jumbled in procurement and supply that sorting out on the approach of action was an impossible task—a medical supply system was required.

He felt that the medical service had to be given a place of honour at least equal to that of any other Corps, that its officers and men be recruited from the best in the country, and finally that the Director-General should have

rank and authority equivalent to that of the Commander-in-Chief of the Army. The Nation must understand that to protect the lives of its battle-worn men and officers is as important as to fight the enemy.

He also believed that the Army and Navy Medical Departments, and the National Aid Society should not be subordinate to the War Office and Admiralty, but should be under a minister responsible to Parliament, the Nation and the profession. The minister should be advised by a council of military and civilian medical experts. It may be of interest to note that in 1975, the Armed Forces Medical Advisory Board was set up to advise the Secretary of State for Defence in medical matters as Ogston laid down.

The seeds of these ideas had unquestionably been planted in his mind by those young regular firebrands and reformers, Evatt and Shepherd at their meetings in Aberdeen some ten years before. Today we have come a long way towards completing his recommendations.

FORMATION OF THE ROYAL ARMY MEDICAL CORPS

From 1896 a subcommittee of the British Medical Association had been studying the problems of the Army Medical Department and had strongly recommended reform to Lord Landsdowne, the Secretary of State for War, with a request that he should receive a formal deputation. In January 1898 Lord Landsdowne received a deputation of distinguished doctors, led by Sir Thomas Grainger Stewart, President-Elect of the British Medical Association and including Professor Ogston. The submissions of this group were finally accepted and the Royal Army Medical Corps was formed on 1 July 1898. Amalgamation of officers and other ranks occurred and substantive military rank was conceded, and the long, bitter struggle was over—no-one having more influence or speaking with more authority than Ogston. The establishment of the day however, showed their displeasure by refusing to recommend Jamieson, the Director-General for an honour which was his due. One would have thought that Ogston would have rested after such a triumph, but not a bit of it. Having since his adventures in the desert visited the Army Medical Services of Germany, France and Russia, he then, armed with letters from Queen Victoria, visited military and naval hospitals and institutions in England. He was appalled to find how far ahead of us other countries were. This unfavourable comparison was the theme for his Address on Surgery to the British Medical Association meeting in 1899 at Portsmouth. Although gaining general support in the country and among younger doctors, his outspoken views were taken as criticisms of themselves by many of his senior friends in the British Service and they never forgave

him. Later that year the South African War started and during that campaign the truth of all he had said was revealed.

SOUTH AFRICAN WAR

It was a misfortune that the South African war against the Boers broke out in 1899 little more than a year after the formation of the Royal Army Medical Corps. The fledgeling corps could not possibly have been ready. The War Office had conceded its organization structure and command system after decades of bitter opposition, but the Army in general was not prepared to accept the medical branch and give it rightful support. There was no time to recruit and train those splendid soldiers described by Ogston, and the medical officers were uneducated in, and unfamiliar with their new staff and command duties. Proper procurement of medical supplies and a suitable transport system had not been arranged. The campaign turned out to be another series of military disasters, and looking at it in retrospect after 80 years, it was characterized by the extreme fortitude and bravery of the British soldiers and regimental officers in the field and the gross incompetence and stupidity of many commanders and their staffs. The Nation had no idea of the vast distances, hostile climate and impossible terrain up country. They knew only the gentle fruit growing area with the lovely beaches of the Southern Cape. The Commander-in-Chief was General Sir Redvers Buller, later to be replaced, who had as Quartermaster General in 1889, with the Duke of Cambridge and Lord Wolseley, bitterly opposed reform in the medical services and in particular the granting of military rank to doctors.

Meanwhile Ogston, meeting Queen Victoria at Balmoral Castle, had gained her interest and support for his plan to go out to South Africa to study military surgery and to give his services to the wounded. The confirmatory letter on behalf of Her Majesty refers him to Buller for help and cannily appreciates his 'self-sacrifice in thus at your own expense, going to the scene of war'. In the 'Black Week' of military disasters at the end of 1899, when the nation was reeling from the calamitous news and the dreadful casualty lists, our hero set sail for Cape Town. On arrival he found that although the Queen's letters gained him all possible help from the military side, yet the head of the medical department was completely obstructive and humiliating. He does not say who this was, but we assume he was a senior man alienated by Ogston's Portsmouth oration in January of that year and unable to forgive an individual considered treacherous. By contrast the attitude of the subordinate medical officers was warm, kind

and friendly. He congratulates himself on going out with the Queen's interest and at his own expense without asking for the authority and blessing of the Director General of the day. Surely this was a tactless, unwise move and could account for the coolness of his reception.

He was disappointed that use was not made of the Voluntary War Work Agencies or civilian trained nurses, and the spurning of their offers to help. The newspapers said, 'The Royal Army Medical Corps is a magnificently equipped and disciplined force and is in no way in need of (voluntary) assistance in its own department'. A foolish statement—but have we not heard similar sentiments in the not-too-distant past about our own National Health Service!

Ogston visited a hospital train returning full of patients to Cape Town from the battle area, but could find no fault with its efficiency. At the Modder river he was attached to Lord Methuen's staff and Colonel Townsend (later General Sir Edward) was most helpful. He was appalled at the state of the typhoid hospital in a half-completed building and although praising the quality and work of the medical officers, found the conditions under which they were working and the materials supplied in no way supported the boast that assistance was not required. Even the non-medical officers and soldiers saw this.

By contrast when he reached General Gatacre's Headquarters, in the Eastern Cape, he was most hospitably received by the PMO, the Staff and the General himself, who offered Ogston the use of his armoured train for travel which was forthwith made ready. On this 120-ton steel-plated monster, he proceeded towards the Boer lines and after leaving the flat plain entered 'a region resembling the Grampians at the sources of the Aberdeenshire Dee . . .'.¹ On his return south he saw the Red Cross depot in Cape Town with masses of useful stores but no organization for distribution. People in Cape Town were almost in revolt at the conditions they were learning about and were desperate to help. The Red Cross was incompetent and could not even supply chairs which Ogston demanded for a field hospital, and 'had they supplied a few capable cooks for medical units would have done incalculable good'. A supply officer in the hospital in Cape Town said the 'deficiency of milk and medical comforts is inexcusable and no limit is placed on either. The cooking is execrable and the food as cooked here, is barely eatable by a sound man'. The newspapers at home began to print horrific eye-witness accounts of sickness and suffering just as bad as anything which had happened in the Crimea and public opinion was at last aroused. A South African Hospital inquiry commission was set up, which turned out to be vague and useless and a white-wash to Ogston's fury. This reinforced his long-held conviction that the medical service must be independent of the War Office and directly responsible to Parliament.

On return to the Modder river with the reinforced Army under Lord Methuen, he was horrified at the enormous increase in incidence of typhoid fever and the inadequacy of care for the patients—the flies covering everything, patients' faces, mouths and eyes in black masses. The mortality from this disease alone was twenty-four per cent. Eventually Ogston himself contracted the illness, with fever and thrombophlebitis of the leg. He became so weak that he could hardly walk. He dosed himself with Dover's powder, bismuth, chlorodyne and an array of other medications, but at the end of a days march could only lie exhausted on the ground and could not get his boot off. He began to become confused and eventually on the advice of his friends tried to get back to Cape Town, or into a military hospital, and was admitted as a patient in Bloemfontein. There he lay gravely ill and has recorded for us a most extraordinary description of his own delirium, a well recognized feature of typhoid fever. Many of you may have heard this before in Dr Porter's talk or read it in his paper (1969) I make no apology for repeating it and would make this passage required reading for every student of medicine.

I was conscious that my mental self used regularly to leave the body, always carrying something soft and black . . . and wander away from it under grey, sunless, moonless and starless skies, ever onwards to a distant gleam on the horizon, solitary but not unhappy, and seeing other dark shades gliding silently by. . . . I seemed to wander off by the side of a silent dark, slowly growing great flood, through silent fields of asphodel, knowing neither light nor darkness, and though I knew that death was hovering about, having no thought of religion nor dread of the end, and roamed on beneath the murky skies, apathetic and contented until something again disturbed the body. . . . I was drawn back to it . . . and entered it with ever growing revulsion.

Some weeks later he slowly began his recovery and convalescence, and was eventually evacuated to Cape Town and home to England in July 1900. His furious parting shot after the campaign was that 'the British War Office in medical matters, was dragging along years behind other countries, obstinate, ignorant, narrow-minded, self-complacent, and strangled in ancient pipe-clay and red-tape'.

FIRST WORLD WAR

On the commencement of hostilities in 1914, Ogston once again applied to the much maligned War Office for a post anywhere, in any capacity. He received only a courteous acknowledgement of his letter. He had no doubt that his age was the factor which excluded him; as he was now seventy his rejection was not surprising. He was not put off by the War Office attitude

but volunteered for Southall Auxiliary Military Hospital and acted as operating surgeon during 1914 to 1915 when he was asked to go to Belgrade to take charge of a hospital detachment for the British Naval Force on the Danube, supporting military operations against the Austrians. After a short time he had to return to Salonika to see a relation who was dangerously ill, and this patient had to be taken back to London under Ogston's care. This journey and his return to Serbia took much time and there were many adventures. He left the hospital in Belgrade 'as I was out of sympathy with the manner in which some matters concerning it were conducted'. Before leaving that country, he had formed a high opinion of the care, skill and humanity shown by the Serbian Army Medical Department. There were however, some British officials whose behaviour was scandalous.

Ogston forbears to mention that in 1915–16 he was President of the British Medical Association, but simply says '. . . after a year in various activities connected with the War'. Repeated efforts to rejoin the British Army were all futile but eventually in 1916 he had the opportunity to serve as an operating surgeon with the first British Ambulance Unit (supplied by the Red Cross) for Italy. This unit joined the Second Italian Army on the Austrian front and with it he worked happily for some fifteen months. The front line held by the Austrians in the mountains behind Udine and Gorizia commanded one of the main passes between the Carnic and Julian Alps and many of the roads were within range of the Austrian artillery. Having settled into his unit location, he soon procured a pass from the Italian commander which allowed him full access to the war zone and permission to inspect any or all medical installations. Of this he took full advantage and toured extensively. He was often well in front of the Italian guns and noted that the noise of roaring and crashing prevented him hearing the whistle of rifle bullets. He formed a very high opinion of the Italian Medical Service but pointed out the grave defect—lack of young, competent women nurses. (The moral standards of Italy forbade their employment.) The 'Religieuses' and elderly ladies of rank were nearly all unfit for the work, although he greatly admired their efforts and dedication.

Ogston considered that the Italian Army had fine well-trained officers and men. They excelled in the difficult operations of mountain warfare and the medical backup for their troops was extremely skilful and competent. He felt that few soldiers in the world could have maintained the attacking spirit in those terrible mountains, and he notes that their bravery was matched by their kindness to enemy captured and wounded. In the middle of a fierce battle, now aged 73, he got himself to a field dressing station where he relates '. . . on an exposed part of our route about 200 metres from the Austrian trenches, and there the great guns flashed and crashed

and bullets whistled, reminding me of former days in other parts of the world'. He also visited many of the forward stations in the frozen depths of the Alpine winter through deep snow drifts and at risk from avalanches.

Naturally this life took toll of his health and although only sick for three days in a year of service, he obtained six weeks leave to return to Scotland to recover his strength to enable him to serve to the end of the War. (He would have by then been aged 75.) In his absence the Austrians attacked fiercely through Friuli towards Udine and Venice, and an Italian Army was defeated at Caporetto, resulting in disastrous and disorderly retreat. The Hospital at Trento had to be abandoned and Ogston met his colleagues as refugees in Paris, as he was on his return journey. Nothing daunted he got himself back to Mantua and among the scattered remnants of the Second Italian Army, looked for the remains of his unit. He managed to find 22 pieces of transport including thirteen ambulances, and five of his old unit sick in Castelbelfonte. There was no medical equipment, drugs or dressings of any kind for them, and the Italian medical officer was posted off elsewhere. Ogston managed to obtain some disinfectant, bed linen and packets of invalid food, and began to care for the patients. He learned that the unit was to be disbanded and deplored this, offering to set up a small, well-equipped hospital, with proper nursing. This was refused as was the offer of his service to the British Red Cross commissioner. He stayed caring for the little group of sick until arrangements were made for their welfare and in November 1917 the gallant old warrior started off on his journey home.

EPILOGUE

There his book ends and so must my account of this great Aberdonian. His interest in and influence upon military medical affairs began in 1870, and thereafter he campaigned ceaselessly for reform and improvements particularly in the field of organization for war. As he insisted equipment, training and transport must always be kept up-to-date or disaster will result.

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