

## Historical Perspectives

# Albert Chalmers: Perpetual honours for a prominent tropical medicine career in the Sudan

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## ABSTRACT

This article starts with brief review of Albert Chalmers' early career in tropical medicine until he was appointed Director of the Wellcome Tropical Research Laboratories in Khartoum (WTRLK) in 1913, succeeding Andrew Balfour. Then the article explores how Chalmers faced the challenges and managed to establish a solid research base under very harsh conditions. Most of his directorship was during the First World War, with shortage of staff and increased routine work load. In spite of these constraints, Chalmers managed to establish a base for research in tropical medicine in WTRK. Chalmers' research concentrated on the taxonomy and pathogenicity of bacteria and fungi but he also worked on miscellaneous dermatological disorders and on sleeping sickness. His papers reflect a wide range of knowledge and deep understanding of the topics he was covering. His work on the classification of pathogenic fungi was widely recognized. He tried

different preparations of vaccines for cerebrospinal meningitis but with the technology available at the time he could not produce a potent vaccine. Chalmers' papers reflect the tremendous effort exerted in their production. Chalmers resigned from WTRLK in 1920 and died of acute infective jaundice in the same year. In 1921 his widow, gave £500 to the Royal Society of Tropical Medicine and Hygiene (RSTMH) in memory of her husband. The RSTMH Council decided to devote this money to the foundation of the Chalmers Memorial Medal.

### Key words:

History of Medicine; Sudan; Albert Chalmers; Chalmers Memorial Medal; The Royal Society of Tropical Medicine and Hygiene; Wellcome Tropical Research Laboratories; Khartoum

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## INTRODUCTION

This year a new recipient for the Chalmers Memorial Medal is due to be announced by the Royal Society of Tropical Medicine and Hygiene (RSTMH). The medal, which is in silver gilt, bears a likeness of Dr Albert Chalmers, one of the pioneers of tropical medicine, over the motto *Zonae torridae tutamen* on the obverse, and on the reverse a representation of *Anopheles gambiae* above a spray of the cinchona plant and encircled by the name of the Society

(Figure 1). The list of past medal recipients includes a number of prominent names in tropical medicine [1]. In previous communications we reviewed the history of the Wellcome Tropical Research Laboratories in Khartoum (WTRLK) and its contribution to tropical medicine and to development of the Sudan [2]. The present article is dedicated to the work and extraordinary career of Albert Chalmers in the Sudan, for which he continues to be honoured till the present day by the RSTMH.



Figure 1 - The Chalmers Medal (A) obverse, (B) reverse.

### Early years of Albert Chalmers

Albert John Chalmers was born in Manchester in 1870. Qualifying in 1890 at University College, Liverpool, he held the Holt Fellowship before joining the West African Medical Service, in which he served for four years on the Gold Coast, and in 1900 he received a medal and clasp of the Ashanti Expedition. He left for Ceylon in 1901 where he worked for the next ten years as registrar at Colombo Medical College. In 1911 he was awarded the Coronation medal. After a period of service with the Pellagra Field Commission he was appointed in 1913 Director of the Wellcome Tropical Research Laboratories in Khartoum. By then he was

a well known name in tropical medicine. While in Colombo he co-authored with Aldo Castellani the *Manual of Tropical Medicine*, the first edition of which appeared in 1910 and was described by F H Garrison as “the best modern book on tropical medicine” [3].

### A new role for the laboratories

It has been suggested that Manson and Ross reflected two rival traditions associated with two different aspects of the medical profession. Manson was representative of a new, reductionist and research-based “laboratory medicine”, whereas Ross acted

within the older preventive and sanitary tradition. If we apply such a distinction to directors of the WTRLK then Chalmers would fit in the school of Manson whereas Balfour tended to follow the tradition of Ross. Moreover, Balfour's tropical medicine career, like that of Ross, started with military service and a strong public health orientation as demanded by imperial expansion. Chalmers, on the other hand, represented a second generation of tropical medicine workers, attracted to tropical medicine primarily as a fertile field for scientific research and academic excellence. Thus it was not surprising that Chalmers made major changes in the structure and management of the laboratories. He explained that "The whole laboratory was recast to enable work on human diseases & inoculations of animals to be performed & special chemicals were obtained to form media for the growth of the germs" [4].

The laboratory was gradually transformed into an institute for tropical medicine in the strict sense, leaving for a while the integrated multi-disciplinary research policy. Reginald Massey had been appointed by Balfour as "Economic Botanist" to study poisonous plants and problems of Acacia and cotton, and to work on a botanical garden. These were not within the sphere of Chalmers' interest. "This gentleman had a laboratory and a room in these laboratories for some time," he wrote in his first interim report, "but he belonged to the Research Farm and eventually moved to that station" [5]. Yet research with obvious economic benefits continued in the Chemical and Entomological Sections. As Chalmers was not interested in sanitary work, the post of MOH of Khartoum was handed to Colonel Leonard Bousfield, RAMC, the two laboratory clerks were relieved from their involvement in sanitary office work and, instead, assigned new duties in supervising the library and filing of documents. Because of lack of funds, Chalmers had to purchase, at his own expense, papers from all over the world. Now new facets of research

were begun in the WTRLK, such as studies in the taxonomy of bacteria and fungi, which were made possible after provision of the required chemicals and equipment. One of the pressing research topics that Chalmers tackled was cerebrospinal meningitis. He started communications with Simon Flexner, who was then a world authority on this disease, and made arrangements to spend his leave in New York to see Flexner and the Rockefeller laboratories. Every detail was arranged for his departure from Khartoum on 25 August 1914 when the war began and all leaves were cancelled [6].

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### **The Wellcome Laboratories during the First World War**

For most of his directorship of the WTRLK, Chalmers had to work under the adverse conditions of the First World War. Besides the difficulty of obtaining supplies, the laboratory was severely depleted of its staff. Archibald was called to serve in the Dardanelles during the Gallipoli campaign. O'Farrell, Protozoologist and Assistant Bacteriologist, together with MacDonald the Laboratory Assistant were called up for war duty in Egypt. O'Farrell, captured by the Turks in Sinai in April 1916, was held as a prisoner of war for two years, after which he resigned his post in the WTRLK. In spite of the shortage of staff, the routine work increased tremendously, especially in the Bacteriology Section. Work hours extended from 7 a.m. to about 2 p.m. and from 6 p.m. to about 7.30 or 8 p.m., seven days a week. Soon the senior assistant, Alexander Marshall, contracted typhoid and had to be sick-listed for eight months. The work load increased yet more as a result of a severe outbreak of cerebrospinal meningitis. During his investigation of this, Chalmers had the misfortune to prick his right thumb with a contaminated needle. His hand was infected and, in addition, for a long time he had to cope on his own with the work in the Bacteriology

Section. Moreover, he had to cover the Entomology Section also when Harold King, who was in charge, fell sick. Chalmers was extremely frustrated that his appeals for help were not responded to by Balfour, who was then a Lieutenant-Colonel and member of the Medical Advisory Committee to the Mediterranean Expeditionary Force. Chalmers communicated his grievance to Wingate:

*Recently we had to do about 100 routine examinations daily which if continued for 18 days would exceed the routine work performed by the bacteriological section of the laboratories in the 31 months which elapsed between the 3rd and 4th report issued by Balfour . . .*

*I do not think that it is necessary or advisable [Chalmers' emphasis] for Archibald to be kept there indefinitely doing mere routine work and I ask that it may be made clear that his services will be required here as soon as he has set matters going. It also seems to me that it is necessary to recall O'Farrell and MacDonald one very shortly and the other after a little time [7].*

This view was supported by Archibald himself who wrote to Chalmers about his work at the front:

*I realize fully all that you say & all the difficulties you have had but I want you to feel that it was no wish of mine to stay away when I know how hard pressed you were & how much you required . . . I have been here a mere puppet & being only a Captain had no say in things & in fact had no idea of what was taking place [8].*

Balfour, on the other hand, thought otherwise as shown by his dramatic response when Wingate recalled Archibald:

*The order for Archibald's recall came like a veritable bombshell, upsetting not only the Military Medical Authorities but also the Committee of which I am*

*member. So seriously did we regard the matter that I took the liberty of sending you a cable forthwith which I earnestly trust may have the desired effect [9].* Balfour's message did have the desired effect. Archibald's recall was cancelled and Wingate had to write an apologetic message to Chalmers:

*I do not think that Balfour, in spite of all his experience in the Khartoum Laboratories, quite appreciates the enormous strain on your resources and yourself personally, but on the other hand I know that you will willingly strain every nerve to help in the great cause of preventing the spread of epidemic disease amongst our troops in the Dardanelles, and at the same time I felt sure that in asking you to spare Archibald's services you would unhesitatingly make this sacrifice and would do all you could to help your old friend and predecessor [10].*

Perhaps one reason for Balfour's reaction was that Chalmers' publications continued to appear in international journals throughout the war. In another communication to Wingate, Balfour had this to say:

*Believe me, I quite appreciate the circumstances but what I feel is that at a time like the present all research [Balfour's emphasis] work except such as is intimately connected with the war should come to an end, at least where, if carried on, it would keep a worker from war service [11].*

When the First World War was over in November 1918, many were gratified by the medals, clasps or brass stars given in recognition of their suffering. Chalmers was probably more satisfied by the statistics he included in his annual report for that year:

*The great increase in this work during the war years, 1914-1918 inclusive (over 14,000 examinations), has thrown such an amount of continuous microscopical work on Major Archibald and myself that that eye,*

*which we use mostly for this purpose, has become strained, but this is one of the outcomes of war conditions* [12].

Yet every cloud has a silver lining. In medical research, as a result of the war, there was a better appreciation of the significance of work on communicable diseases and sanitation. In his third edition of the Manual of Tropical Medicine, which appeared in 1919, Chalmers alluded to this:

*. . . still there is a great field for research, and one of the direct blessings of the recent war will be the stirring up of Governments to provide funds for this work, which should never be left, as it used to be, entirely or almost entirely to individual generosity* [13].

#### Research work under Chalmers

In spite of all the difficulties, the Bacteriological Section under Chalmers produced 71 publications by December 1917 (Figure 2). Chalmers' own research concentrated on the taxonomy and pathogenicity of bacteria and fungi but he also worked on miscellaneous dermatological disorders and on sleeping sickness.

His papers reflect a wide range of knowledge and deep understanding of the topics he was covering. The work he did on the classification of pathogenic fungi was widely recognized. He tried different preparations of vaccines for cerebrospinal meningitis but with the technology available at the time he could not produce a potent vaccine. Chalmers' papers reflect the tremendous effort exerted in their production. Typically he would start with an exhaustive historical account and a comprehensive review of the literature in which he frequently quoted non-English works in their original languages. A notable feature of his research was that he involved his junior staff. Perhaps this is what made Archibald write to him from the Dardanelles: "My heart is in that country & I feel my work is too & I want to return & do some work with you & for you." [14].

It seemed that Chalmers never forgot his role as mentor even in the darkest hours. When O'Farrell was a prisoner-of-war in Turkey he wrote to Balfour asking for some drugs and medical comforts, and mentioned that, "*Chalmers is I believe sending me out some reprints and a book on immunity, which will be pretty heavy reading for the Censor but it will be good to get it as there is plenty of time here.*" [15]



Figure 2 - Dr Albert Chalmers with a group doctors and Sudanese leaders. Circa 1916.

*Seated L to R : Sayed Abdel Rahman Al-Mahdi, Sayed Sherief Al-Hindi, Colonel Bernard, Colonel Max Logan, Dr Mekhlawi, Colonel Carroll (Director of the Medical Department), Dr Goodwin, Dr JB Christopherson, Dr Albert Chalmers, Dr Forbes, Dr L. Bousfield* [16].

### Chalmers' resignation

Chalmers was a passionate book collector and a capable author. One of the main things that attracted him to work in the WTRLK was the series of magnificently produced reports issued by the laboratories and edited by Balfour between 1904 and 1911. However, after a few months in Khartoum he was disappointed to realize that there were no permanent arrangements for the publication of further reports. In his interim report for 1913 he wrote:

*This question is now becoming serious as no full report has been published since 1911 and a large mass of material has been collected and is more or less ready for publication. The life of the laboratory depends upon its publications, and unless either a full report is published shortly or a series of bulletins organised, the position which Dr Balfour made for the laboratory in the scientific world cannot possibly be maintained [17].*

When he failed to get a response, Chalmers, apparently, revealed his intention to resign. It is also apparent that Balfour learnt of this and wrote a confidential letter to Wingate warning him about Chalmers' impending resignation and the reasons for it. Wingate responded with the following letter:

*My dear Balfour,  
I should have written to you some time ago in reply to your Private and Confidential letter of April 13th, but a good many inquiries were necessary, all of which took time, and previous correspondence had to be looked up, and I found it was considerably distributed amongst various offices and it required careful manipulation to unearth it without giving away reasons for my inquiries. Perhaps the most difficult was my inquiry from Chalmers himself, who of course, as you know, is doing admirable work and whom I am most anxious to assist in every way. Indeed nothing would*

*grieve me more than that he should feel that the arrangements we were prepared to make in the Sudan for the proper publication of the magnificent results the Wellcome Research Laboratories have obtained and continue to obtain in the Sudan as to make it impossible for him to continue his service in this country. I think you are well aware of my own sentiments in this matter and how much I regretted the unfortunate turn of events. Unfortunately at the present time, with our finances as they are and with all the upset in our arrangements caused by the war, I really do not believe that either by hook or crook we could screw out of the Financial Secretary £500, but I am equally certain that as soon as the great stringency is over, we shall be able to make an annual contribution of this sort, and I see that it was foreshadowed as being possible in 1915, and it certainly would have been forthcoming had not this unfortunate war broken out. My idea would therefore be for you to confidentially sound Mr Wellcome as to whether he would be prepared to renew his very generous offer, provided that the Sudan Government guaranteed £500 a year when the war is over. Of course, this does not meet the immediate emergency, that is, how to provide funds for the publication at once of a report on the old lines, for I feel that unless such a publication is undertaken without delay, Chalmers may give effect to his threatened resignation.*

*I may mention that he has said nothing about this to me, but I expect that your information on this matter is probably correct. Can you make any suggestion as to how to get over the present difficulty for, as far as I can see, there is absolutely no possibility of raising the wind until the war is over, much as I should like to be able to do so [18].*

This plan did not materialize, but Chalmers seems to have been persuaded to defer pressing for publication of the reports till the war came to an end, as he indicated in his annual report (which he insisted on calling an interim report) for 1915: "The question of the publication of a full report has been shelved sine die because of the war, and we are attempting to make known our work by means of bulletins and reprints" [19]. Yet again he renewed his demand for publication of reports in his annual report for 1916:

*The question of a full report on the lines of the four published by Lt.-Colonel Andrew Balfour, C.M.G., R.A.M.C., is becoming more pressing as we have received inquiries with regard to this matter from the Medical Officers attached to one of His Majesty's Expeditionary Forces, and there seems to be no doubt that the knowledge acquired by the Laboratory during the last five years would be rendered much more accessible if collected in two or three volumes rather than, as at present, scattered through medical, chemical and entomological literature. It is earnestly hoped that some arrangement will be made so that a report can be published as quickly as possible when the war is over, as the laboratory is characterized by being one of the few in His Majesty's dominions which since the war began has not been supplied with the facilities for publishing a single report [20].*

Again, the problem was touched on in the report for 1917: *The question of a full report, as indicated in last year's interim report, is being made the subject of a special communication, and will be considered again in the interim report of 1918.* In the report for 1918, Chalmers almost said that he had waited long enough:

*The question of a full report will be brought forward during 1, as by 1920 no such report will have appeared for upwards of nine years, owing to lack of funds but not lack of material. While the war was*

*in existence, no such report could be produced. Now that it is evident that the European war will finish sometime in the present year; it is obvious that, failing some good reason, the extraordinary amount of material gathered together by the Bacteriological and Entomological staff should be utilised to produce two or three volumes, one containing the enquiries into the diseases of the Sudan, the second into Entomological problems, while a third might contain Botanical and Chemical reports. As usual, during 1918, the Laboratories continued to be in touch with British, Allied and Neutral Institutions throughout the world, but recently a number of enquiries have been made as to the date when a report may be expected from these Laboratories [21].*

In the middle of February 1920, Chalmers submitted his resignation to the Sudan Government and set out with his wife on a well-earned leave to be spent on a round-the world journey but he fell ill in India. He died of acute infective jaundice in the General Hospital at Calcutta on 5 April 1920.

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### **The Chalmers Medal**

In the early years of the 20th Century, life in the Sudan was particularly hard for the wives of British officials. There were few British women in a society centred on club life. Most were led to accept this hardship by an awareness that "one was part of a world-wide British Empire and in some way privileged to be part of it" [22]. Chalmers' wife had, in addition, an awareness that she was a partner in her husband's strenuous effort to make lasting contributions to medicine and science. For this reason she was particularly keen to see the efforts of her husband recognized. A short time after Chalmers' death, a review on the third edition of the Manual of Tropical Medicine co-authored by Aldo Castellani and Chalmers was published in the Journal of Parasitology [23].

Because the reviewer praised the book and its authors, Balfour made a copy of the review and sent it to Alice Chalmers. She wrote to Balfour expressing her satisfaction with the favourable review, but she seemed very upset that her husband was not given the due credit:

*“ Why the reviewers should describe my husband as “the junior author”, I fail to understand. In age he was senior by 4 1/2 years, and I think had held just as important titles. It was my husband and not Dr Castellani, whom the publishers asked to write the book for them, & it was he who invited Dr Castellani to collaborate with him, not vice versa. And I think it is an open secret that my husband did the large share of the work. As every word of the M.S.S of the first edition passed through my hands I could pretty well judge. Of course Dr Castellani’s name is more widely known in continental countries, owing to his having discovered the Sleeping Sickness germ, but as regards the writing of the manual, it is quite wrong that my husband should be regarded as his understudy. I always argued with him that it was ridiculous to put Dr Castellani’s name before his own, but he would do it & now his name is to go down to memory as Dr Castellani’s satellite, which he certainly was not.”* [24].

To perpetuate the memory of her husband she made numerous contacts and wrote to members of the Royal Society of Tropical Medicine and to Sir James Cantlie, President of the Society to make sure that an appropriate obituary of her husband was written. She was particularly anxious that his work in the Sudan was made known. In a letter to Balfour she wrote:

*“..As regards our 10 years in Ceylon, there has been a very well-written & accurate account in the journal of the Ceylon Branch of the B.M.A.. This might almost be embodied in toto & would save Sir James the*

*trouble of considering the history of those 10 years. With regard to our 7 years in the Sudan, it seems to me that, owing to the disagreement between Mr Wellcome & the Sudan Government, there is going to be absolutely no record at all of my husband’s 7 years of strenuous work, & the work he encouraged others to do with him at the laboratories in Khartoum. It is of course impossible for Sir James to ascertain details of these 7 years, and I thought that it might be a good idea if Major Archibald were asked to write a short account for Sir James to use.*

*“And I also, I thought there might be a complete list, at the end of the publication, of the numerous original papers which my husband either wrote entirely himself, or encouraged his helpers to write with him, during those years. This would make a useful list for reference. Otherwise it seems to me his original work of the last 7 years will be lost in oblivion...”* [25].

She also donated his collection of books to the Royal Society of Medicine. The British Medical Journal stated that it was probably the finest collection of books on tropical medicine to be found anywhere. Moreover, she donated £ 500 to the pay for shelving and furnishing a room for this collection which was called «The Chalmers Library». Unfortunately these books were distributed among other collections afterwards.

Perhaps the most effective method by which Alice Chalmers perpetuated the memory of her husband was by donating £ 500 to the Royal Society of Tropical Medicine and Hygiene to create a medal in his name. At first she was not satisfied with the motto proposed by the Royal Society for inscription on the medal, which read « Zonae torridae tutamen ». The motto implies that the medal rewards achievement in the field of health in the tropics, whereas Alice Chalmers wanted her Husband’s work to be viewed as more universal, contributing to advances in medicine and science [26]. However, after Wenyon wrote



explaining to her how they thought of this matter she agreed wholeheartedly:

*“Of course I agree with you that altruism is, or should be, at the base of all medical research work, not merely the advance of Science in the abstract. What I meant to indicate, though I am afraid I cannot have expressed myself very clearly was, if I may adapt the well-known couplet:-*

*Races are many, but Health is one, And includes*

*them all.” [27].*

Now the Chalmers Memorial Medal continues to be one of the most prestigious awards offered by the Royal Society of Tropical Medicine and Hygiene every year in recognition of outstanding research contributing to knowledge of tropical medicine and tropical hygiene. To recognize Chalmers great interest in the work of young men, the medal is restricted for persons forty-five years of age or younger on the 1st June of the year.

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