

Also by

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# Daoud Mustafa Khalid

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## His life and work

Milestones in Sudanese Internal Medicine, Tropical  
Medicine, Neurology, & Medical Education

By  
Professor Ahmad Al Safi

In the occasion of  
Daoud Mustafa Commemoration Week  
(December 2009)

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Sudan Medical Heritage Foundation Publications

Author Ahmad Al Safi  
Book Title Daoud Mustafa Khalid, his life & work:  
Milestones in Internal Medicine, Tropical  
Medicine, Neurology, & Medical Education  
First Edition 2009  
Deposit No.  
ISBN  
Copyright© Sudan Medical Heritage Foundation  
Cover Ahmad Hussain  
design

## Abbreviations and Acronyms

DKSM	Diploma of Kitchener School of Medicine
FMOH	Federal Ministry of Health
FOM	Faculty of Medicine, University of Khartoum
FRCP	Fellowship of the Royal College of Physicians
IED	Institute of Endemic Diseases
MOH	Ministry of Health
MRC	Medical Research Council
MRCP	Membership of the Royal College of Physicians
NCR	National Council for Research
NHL	National Health Laboratories
SMRL	Stack Medical Research Laboratory
SMS	Sudan Medical Services
SSTMH	Sudanese Society of Tropical Medicine & Hygiene
SUH	Soba University Hospital
UCK	University College of Khartoum
UOK	University of Khartoum
WTRLK	Wellcome Tropical Research Laboratories in Khartoum

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## Acknowledgements

I acknowledge with gratitude the verbal and written contributions of all the members of the Daoud Mustafa Commemoration Committee initiated by the Faculty of Medicine, UOK. I also made use of the various pieces of information and anecdotes that were generously offered by his many friends, school mates, associates, co-workers, and students. Their contribution to this work has been invaluable.

In writing this book, I made full use of Professor Daoud's résumé, which I retrieved from his personnel file in FOM. I also made use of the several obituaries in the daily Sudanese newspapers, and on Omer El-Juzali documentary in the Sudan TV programme (*Asmaa fi Hayatina*), and on a three-episode article on Professor Daoud by his son Dr Mustafa Daoud Mustafa in *Al Rayalam* daily newspaper on 6/6/2009, 19/6/2009 and 26/6/2009. Dr Mustafa kindly accepted that I edit these articles and include them in the Arabic section of this book.

I solicited several testimonials from close colleagues, students, and coworkers who were close to Professor Daoud. Their contributions have been illuminating in several respects. I was fortunate to find out that several testimonials have already been written for a special issue of the *Khartoum Medical Journal* dedicated to the memory of Professor Daoud. I thank Professor Sulaiman S. Fedail, Professor Abdel Rahman Mohamed Musa, Professor Mohamed Ahmed Hassan, and Dr Mohamed Nagib Abdalla for their excellent contributions.

Although this author strives for accuracy in his publications, any such work may contain inaccuracies or typographical errors. Changes, corrections, and improvements need to be made and will be incorporated in new editions of this work. The data found in this book have been produced and processed from sources believed to be reliable, and cross checked several times.

The Photo Gallery in this book is selected from a rich collection of photographs uploaded by Dr Mustafa Daoud Mustafa in Facebook in the Cyberspace. He graciously accepted that I make full use of this collection. I convey my gratitude to him and commend his efforts to document the life of his father.



## Preface

This series of books aims at providing concise documentation of the lives and work of the men and women who have shaped health care services in Sudan. This volume profiles the life and work of Professor Daoud Mustafa Khalid whose work has contributed significantly to the development and establishment of medical education in Sudan, the medical profession, and healthcare services.

The idea of this book came up after I finished compiling and editing the works of Tigani Al-Mahi in 1981<sup>1</sup> and 1984.<sup>2</sup> The positive response those two volumes had, encouraged me to continue similar work on more pioneers albeit in a different way.

The work started during my expatriate period in Saudi Arabia (1989-2004), and took fresh momentum after I came back. While pursuing this work, I realized that the work could have far-reaching value than mere documentation.

It seemed to me that allusion to several forefathers of this profession is anecdotal and reflected misinformation and superficial impressions at best. I was even more convinced when I was faced with the dearth of sources available on the book-shelf for the deceased pioneers. The written sources were alarmingly few and historical writings notably deficient. All sources were not readily available.

I also noticed that health care providers and students know little about the founding men and women of this profession. They know even less about the nature and extent of the contribution and impact of the lives and work of the few they know.

These biographies are informative. In their narratives, I avoided all forms of interpretation except in selecting the subjects and assigning them priority of appearance, which I did on my own rigorous criteria.

Finally, I was concerned about many matters relating to the teaching of the history of medicine in Sudan, and of the teaching and training of medicine in general.

The generation and educational gap that have happened were unfortunate. The apprenticeship tradition, the hallmark of medical teaching and training, has suffered badly due to a



multitude of social, economic, and political factors. To bridge this gap and correct things, health care providers, researchers, professionals, and students need to be informed about the history of this profession; history deserves to be written. Personal contributions have to be highlighted. There were lessons to be learnt by posterity from how their predecessors lived and learnt, and from the legacy, they left.

In a fresh look at the lives of these pioneers, there would be an opportunity I presume for the merits of these predecessors to be re-enacted and brought back to life one way or the other.

Ultimately, this work is a story of praise in which I pay tribute to the notables in this profession. In writing it, I have been positively biased towards these particular men and women. The work is one of personal indebtedness to them and the profession. I had the good luck of being taught by, and contemporaneous in a way to many of those notables. This close contact, I hope, makes me a better witness and the documentary interesting and informative.

I appreciated the difficulties facing health care providers, researchers, and medical students when they look for reliable sources documenting the inception and development of the different disciplines in medicine and the roles of the men and women behind these achievements.

I hope that this book increases informed awareness among readers, and help them to be better workers. They would be, I am sure, if they were better educated about the contribution of their predecessors.

The history of medicine is the history of men and women's lives. The 19th-century English commentator and historian Thomas Carlyle, once commented that "The history of the world is but the biography of great men," reflecting his belief that heroes shape history through both their personal attributes and divine inspiration.<sup>3</sup> No great man or woman lives in vain. There is probably no history; only biographies. Professor Daoud Mustafa Khalid, the subject of this monograph, was a medical hero, his legacy is not caught in a monograph like this but perpetuated in the lives of the many men and women he influenced and shaped their lives and set their career paths.

## Introduction

In 1966, Professor Mansour Ali Haseeb, the first Sudanese Dean of the Faculty of Medicine, University of Khartoum announced a competition for designing (the current) emblem of the Faculty of Medicine. Artists from the College of Arts, medical students, and lecturers responded to the call. I won that competition and I was awarded 50 Sudanese pounds. The evaluation panel included Haleem, Haseeb, Anis, and Morgan among few others. It was Morgan who asked me to include a motto for the medical school, and he suggested "Honesty and Humility". Whether that motto was already known or agreed upon, I have no recollection. What I know for sure is that it was officially recognized when it was inscribed on that logo in 1966.

Honesty is a self-evident word: a state of being trustworthy, not likely to lie or cheat, not hiding facts. The second important requisite Pavlov demanded of aspiring young scholars is modesty. Never at any time imagine that you know everything. No matter how highly appreciated by others, have the courage to say to yourself, "I am ignorant". Do not let pride possess you.<sup>4</sup>

Humility is synonymous with modesty. It is having or expressing a lower opinion than is probably deserved, of one's own ability, knowledge, skill, successes, etc. Humility is a visible demonstration of concern and compassion. A culture says 'I don't have all the answers and I want your contribution'. Humility is admission of humanity. Better to admit a shortcoming, or a limitation, than to lead blindly onto the unknown.

It is hoped that all graduates of that school and others would be in accord with the teachings of this 'motto'. However, too much humility erodes self-esteem, and a balanced conscious Ego and self-confidence are essential to leadership and control of one's own practice. Humility, I presume, has been taken by physicians, consciously or unconsciously, too far to the extent of preventing documentation and publication of one's own achievements. When Haseeb used to describe the new comers to that medical school-the only one in the country then-as "the cream of the cream," he was not giving a recipe for unfounded arrogance, but was trying to strike that delicate balance between greatness and modesty.

The men and women included in this series satisfy the criteria I set for notable pioneers. They are men and women of “firsts”. They have established new institutions, founded new disciplines, researched the field, and made new discoveries. Their contributions as scientists or physicians in science and life have been exemplary.

They all set new traditions and models of admirable behaviour. They taught and trained, and more importantly, mentored, and provided guidance and encouragement to several generations of young and aspiring physicians and scientists. They were, without exception, meticulous clinicians, arduous teachers, hard-working researchers and imaginative trainers with proverbial fame. They maintained unimpeachable professional integrity and upheld strict medical ethics, and consolidated sound medical traditions in a rich service career.

The governing value in the lives of almost all these individuals, Professor Daoud Mustafa included, is the achievement of total quality. For them the quality crisis is more fundamental than the lack of technique, inadequate procedure, or absence of rules.

They all worked with purpose, with principles, with top line, with culture building, and strengthening people. In each situation they worked in, they looked for better management, efficiency, perfecting techniques, practices, and processes.

They searched for continuous improvement in their lives and in the institutions, they worked in or for. They have been constantly involved in pursuit of fact and truth – about everything in life. That is why they were also notable social workers, sportsmen, political leaders, writers, and administrators.

Studying the lives of these individuals clearly shows that the path to success and distinction requires hard work and confident persistent toil. Nothing happens arbitrarily through luck, or due to quick fixes.

They were productive persons. They did their jobs as expected in terms of quality. Their performance was solid, fully competent in all aspects of job content and expectations.

That is why they won the admiration and respect of their peers and students. However admirable their qualities as men, it is

their contributions as scientists that have been my chief concern in this series.

## Daoud Mustafa Khalid

### Early years

Professor Daoud Mustafa Khalid (to be referred to as Professor Daoud in this book) was born in Tuti Island (Khartoum) on Friday 10 August 1917. His formal schooling started with *Khalwa*, in which he spent only two weeks, and *Kuttab Tuti* or Tuti elementary school in 1924 for one year before he moved to *Kuttab Abu Zabad* when his father moved to that town. He then moved to Um Rawwaba before they come back again to Tuti.

He had his intermediate schooling in Khartoum in the period 1928-31, and secondary school in Gordon Memorial College (the only secondary school in Sudan at that time) in the period 1932-1935.

He joined Khartoum Kitchener School of Medicine in 1936, in which he spent 5 years.<sup>5</sup> His outstanding educational career included Anatomy and Physiology prizes in 1937 and prizes in Medicine, Surgery, and Pathology on graduation with DKSM in 1940.<sup>6</sup>

### Career

Professor Daoud Mustafa joined Sudan Medical Services (currently Ministry of Health) as house officer in Khartoum and Omdurman hospitals in 1941-2. His internship lasted two years, eight months in Gynaecology with Dr Hovel,<sup>7</sup> eight months in medicine with Mr Humphreys,<sup>8</sup> and eight months in surgery with Mr. Mayane.<sup>9</sup>

He worked as General Practitioner in Medani (1943-44) and once more in 1949 with Mr. Morris<sup>10</sup> and Dr Coles. He worked as Senior Medical Officer in Merawi for eight months in 1944, Omdurman (1945-46), Sorceppo in Western Equatoria (1946-48), Wau in Bahr El Ghazal in 1948.

In 1950, he was given scholarship to specialize in medicine in the UK in Hammersmith Hospital and Institute for Higher Medical Studies in London, and in London Hospital, north London hospitals, and Queen Square Institute for Nervous Disorders. He acquired the MRCP, London in 1952.

On return to Sudan in 1952, he was appointed specialist in internal medicine in Atbara Hospital, and in 1953 he was

transferred back to Khartoum to work as specialist in Omdurman Civil Hospital and part-time lecturer in Faculty of Medicine, University of Khartoum up to 1958, when he was appointed full-time Senior Lecturer.

In 1960, he went back to Hammersmith Hospital and Institute of Postgraduate Medical Studies in London for further training for one year.

In 1963, Professor Daoud replaced Professor HV Morgan<sup>11</sup> as first Sudanese Head, Department of Medicine in the Faculty of Medicine, University of Khartoum. He maintained that post up to 1974. That department was part of the only medical school in the country, in the only university, and located in Khartoum Teaching Hospital, the main teaching hospital. This is why notable physicians would rightly call Daoud Mustafa the founding father and unchallenged leader and teacher of medicine in Sudan.<sup>12</sup>

In 1965, Dr Daoud was promoted to the status of professor of medicine, Faculty of Medicine, University of Khartoum. In 1974-1975 he was Dean, FOM.

He continued working as an internal medicine consultant and professor in Department of Medicine, University of Khartoum from 1976 up to 2006 on the request of UK.

### **Character**

Those who came in contact with Professor Daoud, students, coworkers, colleagues, subordinates or superiors, found him humble, wise, of noble character, hard working, considerate and respectful to his patients irrespective of social, cultural, ethnic, religious or financial status, and was caring for his students.

‘Medicine became my choice and Professor Daoud was the reason,’ is a statement you often hear from eminent Sudanese physicians. His diligence and competence enticed all his students to emulate him. I wanted to do this the way he did it. He had no idea of the influence he had on the career choice of several Sudanese doctors who spread all over the globe and achieved the highest distinctions wherever they worked.

He persisted unshaken in a job that demanded much and offered little in the way of financial remuneration. His patience and unshaken faith in his profession kept him going on

relentlessly over almost six decades of service fifty of which dedicated fully to teaching and training young physicians.

He was caring and empathetic in his own way. His work had been respected by his peers, his patients, the society and the state at large. His name has been proverbial among the society of Omdurman. However, Daoud Mustafa commented that 'Daoud' praised in the Omdurmanian songs in the early days was Daoud Iskander, one of the first batch of seven doctors to graduate from KSM, and not Daoud Mustafa.

He was remembered as being an exceptionally good teacher. He inspired his students to work three times harder than they normally would. I think it was Fedail who said that while working with him in the proverbial B1 Ward, they failed to beat him in coming earlier to the ward and he was always the last to leave. He was anchored to the beds of his patients, so to speak.

According to the testimony of several student and coworkers, Professor Daoud was described as an extremely private man, well known only to a small circle of colleagues and friends and he remained so until his death.

### **Teachings**

Directly or indirectly, Professor Daoud has been guiding medical students and aspiring physicians to dedicate themselves for life long study, and giving them, implicitly or explicitly, the advices he thought are befitting and appropriate.

He used to tell his students that the road to success in medicine is hard and requires sustained efforts and a lot of labour and toil. They should treat their patients with respect, with kindness and should give them the necessary tender loving care. They should not exhaust patients with unnecessary examinations and investigations. They should develop an ability to understand, communicate with, and effectively interact with patients of differing socio-cultural backgrounds and should not concentrate on the organic part of man. Often time doctors will not be able to cure illness, but they can do a lot in the way of alleviating sick-ness, and comforting their patients and their families. He thought that a competent doctor should be cultured and always abreast of innovations and new discoveries in science and medicine.

He considers practicing medicine a priceless deed of piety, and that doctors in offering their best to their patients are worshipping God in the best way possible.

### **Fields of interest in medicine**

Professor Daoud was an all-rounder clinician who fully grasped a huge corpus of medicine. No subspecialty in medicine was out of his reach, command, and mastery. He was particularly fascinated by neurology and tropical medicine. Neurologist Dr. Mohamed Nagib Abdalla wrote the following to illustrate Professor Daoud's passion about tropical medicine:

“He used to see patients with tropical splenomegaly. He used to measure intrasplenic pressure with a saline manometer, then to inject dye into the spleen (splenoportography) to outline the portal system. He published three papers from this work.”<sup>13</sup>

However, he was particularly interested in Neurology, and he passed that passion to several younger colleagues who became preeminent in this field.

Dr Nagib continues saying:

“His neurological practice was first limited to ward A1 and B1 but later he was given more beds in Shaab Teaching Hospital (Ward 5 and part of Ward 9). He used to run the well-known Sunday neurology clinic at Shaab Teaching Hospital where he used to see patients from all over the country from about 8:00 AM to about 4:00 PM. He used to see his patients in the ward every day including Fridays and official vacations. His grand round on Wednesday was well-known to all doctors. It usually starts at about 8 AM and ends about 2 PM. ...”<sup>14</sup>

His methodic techniques in clinical diagnosis of neurological diseases were second to none, Dr Nagib continues:

“He used to see all forms of neurological diseases and the diagnosis at that time was mainly on clinical grounds. The only investigations available at that time were plain X-Ray, lumbar puncture and myelography. His clinical sense was great. He used to diagnose subdural haematomas on clinical grounds and ask the surgeon to do burr holes and he was always right. Patients diagnosed as having intracerebral tumours were sent to



the late professor Benhawi in Egypt. Professor Benhawi published a paper from these patients sent to him with title "Giant Sudanese Meningiomas." Professor Abel Rahim Mohamed Ahmed, the orthopaedic surgeon, used to operate on patients with cord compression before the arrival of Professor Hussein Abu Salih. The differentiation of types of CVA was on clinical grounds. Patients were labelled as having haemorrhagic stroke if they present with headache, convulsions and loss of consciousness. In the absence of these cardinal signs they were labelled as having ischaemic stroke."<sup>15</sup>

Dr Nagib continues:

"Professor Daoud was much interested in teaching. He used to run a weekly neurological session for 6th year medical students for decades. In these sessions students were taught how to conduct neurological examination and how to interpret the physical signs and how to give a logical differential diagnosis. This gave students from the Faculty of Medicine, University of Khartoum the privilege of being good in neurology."<sup>16</sup>

To organize clinical work and research in this field, he established the Neurology Unit in Shaab Teaching Hospital in the late 1960s and early 1970s, and directed work in this field up until he retired due to ill health in 2000s.

Dr Nagib continues documenting the rise of Neurosurgery in Sudan:

"In 1968 the 6<sup>th</sup> Arab Congress was held in Khartoum. In that meeting it was decided to establish a neurosurgical department as the need for that type of surgery was rising and the expenses abroad were unaffordable for the vast majority of patients. In 1969 the Ministry of Health decided to train doctors in neurosurgery abroad. Dr Hussein Abu Salih was sent to Egypt for training during the period from 1969-1971. That was a great push to the development of neurology and neurosurgery in Sudan. This was followed by other doctors who had their prints in the field of neurosurgery and neurology."<sup>17</sup>

In the 2000s, he and a multi-disciplinary group of scholars of like mind including neurologists, physiologists, and neurosurgeons lead by Professor Mohammed Abdel-Rahman

Arbab thought that time was opportune to establish the National Centre for Neurological Sciences. The project is currently in the formation; Professor Arbab briefed the commemoration committee of the late Professor Daoud in September 2009 of the positive progress of this project. It was proposed that this centre should take the name of Professor Daoud.

### **Postgraduate Training**

Several doctors were sent for post-graduate trainings in the UK under the guidance of Professor Daoud, Professor Abdel Rahman Mohamed Musa remembered. Drs Siddig Ahmed Ismail, Bashir Arbab, Saleh Yassin, Suleiman S. Fedail, Mamoun MA Homeida, Abdul Gadir Elkadaro were sent to Bristol, Abdel Rahman Mohamed Musa, Eldaw Mukhtar, Abdel Hamid Sayyid Omer, Mohamed Osman Mekki, Hasan Abu Asha to Newcastle, and others were sent to London and Edinburgh.

Professor Daoud was also interested in teaching graduates and post graduates. He was very keen in attending the Tuesday clinical meeting and the Thursday grand rounds. In the Thursday clinical meeting interesting and difficult cases were presented by the medical registrars and/or the consultant followed by discussion. These meetings were attended by all physicians working in Khartoum, registrars, medical officers, house officers and medical students. The Grand Rounds were usually presented by one of the school consultants. Initially all cases under the care of that consultant were seen and discussed in the ward, but later this round was conducted in Professor Daoud Lecture Theatre in Khartoum Teaching hospital, and only special cases presented. In both meetings his comments were final and conclusive.

### **Ward (8): Tamanya-gi**

Professor Daoud worked in four wards in Khartoum Civil Hospital, Tamanya-gi (Ward 8) and Arbaa-gi (Ward 4) in the old hospital, and male Ward B1 and female Ward A1 in the new extension. Of the first batches to work in Ward 8 in 1958 and later was Professor Abdel Rahman Mohamed Musa who recalls:

“I started in ward (8) in the old Hospital under Professor Daoud Mustafa. He used to call it the ‘Mud ward’. The

name became clear to me years later when the ward was demolished and it was indeed built of mud bricks!"<sup>18</sup>

The wards of the old hospital were numbered with the suffix (-gi), which is a possessive Turkish syllable. The other numbered wards included the famous, 4-gi, in which Christopherson in 1919 tried successfully potassium antimony tartrate in the treatment of bilharzia in Khartoum Civil Hospital.<sup>19</sup> In this ward Professor Daoud had eight female beds.

Daoud Mustafa worked in Ward 8-gi before he moved to Ward B1. Professor Musa continues reminiscing:

"There were twenty beds in Ward B1 arranged in two rows. Each row included 10 beds and each bed is numbered. Professor Daoud's office was situated at the head of the ward, and adjacent to it there was the side laboratory. Professor Daoud was in the ward every day, teaching students or conducting staff rounds. Only on Tuesdays would he be most of the time away from the ward attending his patients in the Referred Clinic in the Outpatient Department.

There was a daily evening round followed by a session in the side laboratory where blood films, bone marrow films, rectal snips, urine samples, stool, blood, etc were examined. Uncle Saleh, a meticulous laboratory assistant, took hours at the bench examining specimens. Professor Daoud had great trust in him and his verdict was usually final."<sup>20</sup>

With the exception of Tuesdays, he was attached to his patients in the ward, and was well-informed about each and every patient even if he was away. Professor Musa continued:

"I remember Prof. Daoud was once taken ill and took to bed for about a week. I used to visit him at home every evening. He would start asking about the result of the Widal test of patient in bed (1); the chest x ray of patient in bed (2), the marrow film of bed (3), and so on until he covered the (20) beds."<sup>21</sup>

Two activities were considered vital in clinical practice, Professor Abdel Rahman noted: the Thursday Clinical Meeting and the Monday Staff Round. In addition, all registrars participated in the teaching of students and preparation of students' final examination. This was an 'academic festival.' The organization of the clinical examination was exemplary.

Suitable cases were collected from the three Civil Hospitals in Omdurman, Khartoum North and Khartoum. Professor Daoud used to check the physical findings of each case before he gave his approval.

### **Ward B1**

Admissions to Ward B1 were from the medical emergency and the referral medical outpatient department. Professor Daoud used to see referred patients in his office. He used to see patients referred to him from other doctors and some of his relatives.

Ward B1 was a mini empire. Everything in this Ward is relevant and applies to patient care and student career.

Professor Fedail described beautifully his Ward B1 experience and illustrated the enviable qualities of Professor Daoud, he said:

“When we graduated in the Faculty of Medicine – University of Khartoum, I was assigned with few others to do our first shift of houseman ship in internal medicine in Professor Daoud’s Unit ... We went to Ward B1 in Khartoum Teaching Hospital dressed in our best clothes with newly cut hair and no sandals. The medical registrar then was a lady doctor currently a prominent paediatrician (paediatrics was then part of the department of medicine). She welcomed us very kindly and told us that we were fortunate to work in the professorial unit and we have to work very hard. The telephone rang. She picked up the receiver and said ‘hello’ and suddenly stood up and said ‘hello Professor’! This intensified our fear and filled every one of us with awe, and since then I automatically stood up whenever Prof Daoud rang me up!

Professor Daoud ward round was twice a week. I re-clerked all the patients handed over to me, total of 18. This took me two sleepless nights and a whole Friday. Our first round as doctors with ‘The Professor’ was a surprise to us as he was very pleasant even joked with the registrar and asked her about her children.

Ward B1 was clean and neat. Anything we needed was available. The head nurse of B1 was Mr. El Nour Mohamed who had an office near the doctors’ office. His

office was full of everything doctors needed: prescription pads, request forms, pillows, thermometers, sphygmomanometers, spinal needles, etc. He was a very dedicated and kind man, if he noticed that you were tired he would make a cup of tea in his office and bring it over. The Professor had total confidence in him. I believe he was greatly inspired by the Professor and tried to emulate him.

In our office in B1, we had a mini-laboratory in which we did urine tests, blood films for malaria etc... I remember spending nights in the office so as to examine blood films of patients suspected of filariasis. We looked for *Wuchereria Bancrofti* microfilariae which circulate in the blood at night. The joy of seeing one wiggling in the slide at 2 A.M. was unforgettable. In the morning we report our findings to the Professor who would say: 'Oh you had a busy night,' smiled and said, 'well done.' After I finished my houseman ship I rejoined B1 as a medical registrar with the Professor, more senior and with two house officers. The work was intensified with morning and evening rounds including Fridays, when the Professor occasionally dropped in to see if there was a very ill patient. He regularly phoned asking about the level of consciousness of a patient or the level of blood urea of very poor patients in the ward, or ....

He was a general physician with special interest in neurology. He had in-depth knowledge of all aspects of internal medicine, an all rounder, a breed which is extinct now. In B1, patients vary from brain tumours, to sleeping sickness; from amoebic dysentery to myasthenia gravis; from rheumatic heart disease to systemic lupus erythematosus; from pneumonias to leukaemias. He was very keen about the multi-disciplinary approach in managing patients. We regularly consulted a radiologist, haematologist and pathologist, and frequently we went and looked at slides in the laboratory.

In the ward rounds, he was always calm, measured and very caring with a fine economy in words. Only once I saw him stressed, we had a male patient called Kalol, 50 years old from Darfur. Kalol had liver abscess and immediately after a teaching round with the students, he complained of severe abdominal pain. We examined him

and diagnosed a ruptured liver abscess. The Professor became very concerned and immediately called Mr. Mohamed Ahmed Hassan Abdel Galiel (now retired Prof. of Surgery) who opened the patient up. The Professor stayed in his office till the patient fully recovered from anaesthesia and only then left the hospital after 5:00 PM. Kalol died 10 years later from a horse riding accident."<sup>22</sup>

### **The mentor**

Professor Daoud Mustafa was one of Sudan most respected clinicians, and mentors. He was an exemplary teacher with excellent classroom management, knowledge of medicine, and state-of-the-art bedside teaching techniques. He had the four core qualities of a good teacher and mentor: knowledge, the skills to convey that knowledge, the ability to make the material taught interesting and relevant, and a deep-seated respect for students.

Nobody can describe Daoud the teacher better than Professor Sulaiman Salih Fedail a devoted disciple and student. Professor Fedail and other students of medicine took Professor Daoud for a second father. He summed up all the attributes of a mentor saying:

“Daoud was an enabler and type of teacher to emulate. He was a great supervisor, conscientious, dignified and uncompromising with high academic and personal standards and a very strong sense of ethics. Professor Daoud was one of those rare people you meet in your life time who had total integrity and completely lacking in pomposity. He attracted the most able young graduates in whom he instilled the need for high standards in research and clinical work. He was very proud of his young men and followed their carrier with interest. Most of them became leaders in their respective fields. His intelligence, compassion, wisdom and exceptional honesty earned him widespread respect. His presence inspired patients, students and colleagues alike.”<sup>23</sup>

Professor Daoud encouraged aspiring young doctors to do good work and go forward. I remember one incident very well, said Professor Fedail:

“A paraplegic patient was diagnosed as Potts paraplegia but when I re-clerked him I found subtle signs of motor neuron disease. I hesitantly mentioned my findings to Professor Daoud who took great interest and re-examined the patient very carefully, agreed with me and changed the diagnosis. I believe that case among others plus my undergraduate performance had helped me to join the department of medicine.”<sup>24</sup>

Daoud built on his firm knowledge of medicine and clarity of concepts and understanding of techniques to help his students master their material. Because he was interested in and devoted to his patients, and dedicated to his science, he made his ward rounds and classes interesting and relevant to students, interns and registrars.

Mentor is synonymous with counselor, guide, tutor, teacher, supporter, and adviser, and the antonym is pupil. Every word and every shade that defined every word applied to and described the personality of Professor Daoud. Abdel Rahman Mohamed Musa said:

“During his life time, Professor Daoud witnessed so many of his students promoted to professorship and many reached high positions in the University. But, whenever we mentioned ‘The Professor’ we all knew who was being meant ”<sup>25</sup>

In a written testimonial in remembrance of the late Professor Daoud, Professor Sulaiman Saleh Fedail wrote not with little compassion:

“Daoud had very special skills in teaching medicine at the bedside; he demonstrated physical signs with consummate skill. His lectures were concise, and clinically oriented. He was a superb clinician who devoted himself to his patients.”<sup>26</sup>

Daoud was an expert in medicine. He had the ability to communicate his knowledge and experience to his students. He made advanced knowledge attainable to his students, and allowed them to understand the material, and what it meant. He made medicine simple and its concepts crystal clear. He made it an attractive and loveable discipline.

He was organized in mind, systematic and hardworking. He was patient. He would follow symptoms and signs like

detective following threads of clues. He would spend days on end looking at and studying the pattern of that un-subsidying fever and that nagging pain. A house officer will be in real mess if he dared to prescribe Aspirin inadvertently.

He would spare no effort to find innovative and creative ways to make complicated ideas understandable or a difficult case easy. He gave his students knowledge and taught them technique to become self-sufficient, and how to apply those techniques to problem solving. The B1 mini laboratory was the right place to start. Professor Sulaiman Fedail continued remembering:

“Working with Professor Daoud was getting lessons in life on daily basis. I remember once he had severe flue and did not come to the round we decided to go and see him at home in the evening. Our visit turned out to be a ward round, he enquired about all the patients bed by bed in details and as usual we were all very prepared and he was very impressed.

Professor Daoud will be remembered for ever by his unswerving loyalty to the University of Khartoum as an outstanding teacher and mentor, by his kindness, humility and selfless dedication to his patients.

Professor Daoud was a visionary. The environment he created in Ward B1, and of course in other wards in the main hospitals of the Sudan at its hey days, was a model of clinical work, teaching, and research. The model was universal, but Daoud’s is one to emulate.”<sup>27</sup>

Daoud had a deep-seated concern and respect for his students. The creation of a good teaching environment required an immense amount of work. The only thing that would drive you to do that was concern and respect for the adults in your classroom. He did not compromise in that. He had been positive and rarely flexible. He loved medicine and wanted his students to love it too.

He tried many approaches, including meaningful group tasks, that helped slower students gain self-esteem and quicker students learn leadership skills and reinforce concepts.

He established ward rules and saw that they were enforced consistently with everyone. He never humiliated a student.



His dedication to his science made him sometimes unfair and non-objective, but he held no grudges. He was firm, stubborn and rarely seen smiling. This imbued an air of awe around him that scared many students. The anecdotes go to emphasize this: those who out of sheer respect and fear, swallowed snuff or crushed a lit cigarette in their palms to hide their shortcomings when they caught sight of him unexpectedly. Out of sheer respect, none of his students or younger peers dared to smoke or joke in front of him.

He was completely consumed with the love of medicine. His conception of nurturing meant no compromising and no sharing of interests and no excuses. He valued his patients and consequently the subject matter he taught because it is directly related to patient care.

You have to be dressed appropriately, not necessarily handsome. I, Adil Gamal Mohamed Ahmed, Ahmed Osman Sirag and others were in the Community Medicine Tour in Western Sudan in 1968-69. There we bought a copra's leather pair of shoes (markoub) each. Those shoes were just beautiful, and without any prearrangement we put on those shoes on our way to B1. The three of us strolled happily to the door, and Professor Daoud was standing there waiting for the last student to come. When he saw the three of us, he shifted his eyes to those beautiful shoes. He did not utter a word. That was the last time we put on a markoub in a hospital.

### **Teaching medicine**

In addition to his extensive and stimulating clinical teaching, Professor Mohamed Ahmed Hassan and El Kadarro noted, Dr Daoud participated in theoretical teaching of tropical medicine, neurology, and medical ethics. His weekly Wednesday evening lecture on neurology was an example of what is referred to in modern educational terminology as a guided lecture or a lecture-demonstration. His lectures on medical ethics to 4<sup>th</sup> year students were timely and most appropriate. He was convinced that the role of the teacher should not be limited to dissemination of information and skills, but should extend to cover the character and moral attitude of his students and young trainees. Professor Daoud himself was a model of moral excellence. It was not, therefore, difficult for his students and trainees to understand what the concept of being a good doctor entails.<sup>28</sup>

### **Undergraduate training**

It has to be noted that modern organized medical service in the Sudan started with the inauguration of the Anglo-Egyptian Condominium in 1899. A medical department was founded in 1904. The SMS replaced the medical department in 1924. In May 1922 construction of KSM began and the school was opened in February 29, 1924. Training in KSM started with SMS doctors, and the Wellcome Tropical Research Laboratories staff.

Khartoum Civil Hospital, which was opened in 1908, became the main teaching hospital for this school. The entire School of Medicine faculty was government officials either from the SMS or the WTRLK, Haseeb wrote.<sup>29</sup>

The opening of KSM also created new demands on WTRLK. The Bacteriological section of the laboratory was enlarged and moved to SMRL on completion of its buildings in 1928.<sup>30</sup> A pathology section was added to meet the needs of teaching medical students. From its inception, KSM was part of SMS and as such depended for its academic staff on doctors seconded from SMS.

WTRLK (later SMRL) staff taught medical students pre-clinical subjects while clinicians from KCH took over teaching of clinical subjects and carried out postmortems. In September 1951, KSM was incorporated in the University College of Khartoum (UCK) and when the Sudanese parliament conferred full university status on UCK, KSM was made a faculty and named Faculty of Medicine, University of Khartoum (FOM, UOK). The FOM, UOK granted its graduates the combined degree of Medical Bachelor and Bachelor of Surgery (MB BS) in 1959 instead of Diploma of Kitchener School of Medicine (DKSM).<sup>31</sup>

WTRLK had a great impact on the development of health services, medical research, and medical education in the Sudan. They undoubtedly put the Sudan in the forefront of tropical diseases research a hundred years ago.<sup>32</sup>

### **Clinical training of young doctors**

After the graduation of the first batch of doctors from KSM, training of house officers and general practitioners was carried out by Sudan Medical Service Senior Physician, Senior Obstetrician and Senior Surgeon. All of whom were holders of

the Fellowship or memberships of the respective Royal Colleges in London, England or Edinburgh.

New graduates from KSM were distributed by the SMS among the senior consultants who were directly responsible for their proper training. Professor Mohamed Ahmed Hassan and Professor Abdel Gadir El Kadaro both were students, house physicians, registrars, and later life long colleagues remembered those days.

“Whether he worked in Omdurman or in Khartoum, Professor Daoud had a wealth of clinical material to teach his students on. His patients were well selected, well prepared with positive history and demonstrable clinical signs...

Clinical skills were very important for Professor Daoud. He insisted on demonstrating these very meticulously to his students. He would not be happy until he was sure that students were able to grasp their significance and perform them to his satisfaction.”<sup>33</sup>

It goes without saying that all patients under Professor Daoud care were well clerked, fully investigated, properly managed, and carefully observed. The groups of medical students who worked with him were of small size and training approached a one-to-one experience.

At a time when they were no manikins to train on, no simulation devices to demonstrate heart, breath, and bowel sounds, when investigative procedures were few, and laboratory investigations were limited, in brief when they were rudimentary technological aides, Professor Daoud diligently provided excellent care to his patients, and excellent protocols of clinical examination at the bedside.

## **Influence on the Profession**

It would be more convincing to illustrate how impressive and influential Professor Daoud was on Sudan’s medicine if we give a list of specific names of his notable students. But we would be doing injustice to the man. The number of medical students, house officers, registrars, and young specialists who were taught and trained by Professor Daoud was uncountable, and they were not all internists.

All medical students who graduated from FOM, UOK in the second half of the 20<sup>th</sup> century were influenced by Professor Daoud one way or the other. Every one of those doctors went his way and specialised in this or that field of medicine, but retained somehow a glimpse of Daoud teachings.

Daoud model and messages of the importance of discipline, hard work, good bedside manners, and clinical excellence had already spread out nationwide through his many students and co-workers. The ward structures he established, the clinical routines he laid down, the traditions he left behind will be sustained and preserved by his students; and there is plenty of evidence. His faithful students will continue spreading the message through their presence as educated, trained, informed members in whatever institutions they happen to work. Those trained under him in medicine and those who enjoyed his fruitful partnership, will form a skilled advocacy group in this field. The models of Wards B1 and 8 will be replicated in all hospitals.

### **International links**

In his life time, Professor Daoud developed wide international links with the WHO, and the unions of African and Arab universities, and of course with several British and European universities. Those links proved to be extremely useful in promoting postgraduate training of Sudanese doctors in medicine abroad. Those links were developed through his participation in and contribution to the several international conferences and scientific meetings on medical education, internal medicine in general, and in neurology and tropical medicine in particular. During those activities, he visited several countries, medical schools, and research institutions all over the globe.

### **Recognition**

In recognition of his academic excellence and distinctive professional achievements, Prof. Daoud was honoured by the State and several universities inland and abroad. In 1974, Professor Daoud Mustafa was appointed Deputy Vice-Chancellor, University of Khartoum. In 1975, the University of Khartoum bestowed on him the status of Professor Emeritus of Medicine. He was elected president, Sudan Medical Association in 1976, a post he held for two years.

In 1978, he was granted The Republic's Medal of the First Order (Wisam El Gumhuriya) in recognition of his contributions to medicine.

In 1983, he was granted the Medal of Sciences and Arts of the First Order from Egypt. The University of Khartoum bestowed on him the honorary degree of Doctor of Science (DSC) in 1988. In 1989, he was granted the Nilain Medal (Wisam El-Nielain) in appreciation of his outstanding services in medicine and medical education. In 1990, he was granted the State medal *Najmat El-Injaz* in recognition of his services to medicine. In 1998, he was granted an honorary DSC by the University of Gezira.

## **Family**

Professor Daoud Mustafa was born in a Mahas family in Tuti Island, itself known to be a stronghold for the Mahas tribe. His father was a charismatic man who taught himself when there was no formal schooling in the country other than Khalwa (Quranic School). He persevered in educating himself until he became an accountant in Government service. At the same time, he educated himself in Islamic sciences and conveyed the knowledge he gained to his family. He led the Tuti Island delegation to investigate and try to reverse the decision made by the British Director General of Khartoum who took away some of Tuti's agricultural land in 1944. The brief talks between the delegation and the Director ended in deadlock, fire fighting, and death of one of Tuti's natives. Tuti delegation members were imprisoned for varying periods; Mustafa Khalid for one year. Mustafa Khalid died in 1970. His mother Rugaia bint El Faki Daoud died in 1960.

Professor Daoud is survived by his wife Mrs Nawal El Tayib Babiker, one son, Dr Mustafa, an anaesthetist, and three daughters, Hiba in business administration, Samaia, pharmacist, and Rugaia, a mathematics graduate. In actual fact, Professor Daoud had a fourth daughter, Mai. This is Nawal's daughter whom he brought up to become a science graduate.

## **Written contributions**

It is regrettable that Professor Daoud lectures over the years have not been collected and published. They would have made one of the most admirable textbooks of tropical medicine.

Professor Daoud brief resume included a paper titled 'The Pattern of Neurological Diseases in the Sudan - 1966-70.' Those who had a glimpse of this paper said it was a comprehensive record of his clinical experience in neurology, and of course, his interpretation, analysis, and conclusions. Search for this manuscript is going on; it is work to be edited and finished by those concerned.

Among Professor Daoud Mustafa publications listed below, his effort in compiling the first Sudan National Formulary published by the Sudan Medical Council in 1979 was notable. Dr Ali Bedri, one of the first batch of Sudanese to graduate from KSM in 1928, the first Sudanese doctor to be sent to London for postgraduate studies in 1937, the first Sudanese to be elected a Fellow of the Royal College of Physicians of London, the first Sudanese Minister of Health, and first President of the Sudan Medical Council (1968-1974), wrote in the Foreword for this Formulary:

"Those of us who remember the two or three Formulary pages tucked at the end of the Sudan Medical Service Regulations of the 1920s and have seen our medical progression grow from infancy greatly appreciate the effort put into this National Formulary. It has resulted in an up-to-date Formulary, which, I know, has received favourable comment from foreign institutions. The distinguished authors of this Formulary give the reader confidence that its contents will help doctors to prescribe correctly for the benefit of their patients, at a time when we are including on our medical register doctors who have graduated in medical faculties all over the world... All of us in the Sudan, both professional and lay, are most grateful to Professor Daoud Mustafa and the team who compiled this Formulary."<sup>34</sup>

It is worthy of note that the first Formulary ever produced in Sudan was published by Ministry of Health in 1955.<sup>35</sup> 'The two or three Formulary pages tucked at the end of the Sudan Medical Service Regulations of the 1920s' alluded to by Dr Ali Bedri and quoted above referred to what was called 'Medical Service Pharmacoeia'. A sample of this pharmacoeia is appended to the 'Sudan Medical Service Regulations, 1930; It is three pages long and contains 57 items!<sup>36</sup>

## List of Publications

1. Daoud Mustafa. Gross Splenomegaly in the Sudan. *Journal of Tropical Medicine and Hygiene*. 1965; 68:183-188.
2. ---. Neurological Disturbances in Visceral Leishmaniasis. *Journal of Tropical Medicine and Hygiene*. 1965; 68:248-250.
4. ---. Some Aspects of Schistosoma Mansoni Infection. *BMJ*. 1950; 2:658.
5. ---, Editor Compiler. Sudan National Formulary. First ed. Staples Printers St. Albans Limited at the Priory Press: Sudan Medical Council; 1979; 227 pages.
6. Saad Ahmed Ibrahim and Daoud Mustafa. Sick Cell-Hb O Disease in a Sudanese Family. *BMJ*. 1967; 3:715-717.
7. Salih, Y. Salih and Daoud Mustafa. Louse Borne Relapsing Fever (1) A clinical and laboratory study of 363 cases in the Sudan. *The Transactions of the Royal Society of Tropical Medicine and Hygiene*. 1977; 71(1):43-48.
8. ---. Louse Borne Relapsing Fever (2) Combined Penicillin and Tetracycline Therapy in 160 Sudanese Patients. *The Transactions of the Royal Society of Tropical Medicine and Hygiene*. 1977; 71(1):49-51.

## Sources and Notes

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<sup>1</sup> Ahmad Al-Safi; Taha Baasher, Editors. *Tigani Al-Mahi: Selected Essays*. 1st ed. (with an introduction by Taha Baasher). Khartoum: Khartoum University Press; 1981; University of Khartoum, Silver Jubilee-1956-1981. 187 pages.

<sup>2</sup> Ahmad Al-Safi; Taha Baasher, Editors. *Tigani Al-Mahi: Selected Essays*. [Arabic] 1st ed. (with an introduction by Dr. Ahmad Al Safi). Khartoum: Khartoum University Press; 1984; University of Khartoum, pages.

<sup>3</sup> Hirsch, E.D. *The New Dictionary of Cultural Literacy* (Third Edition), Houghton Mifflin Company, Boston, 2002 (quoted in 'Great Man Theory' in Wikipedia, the free encyclopedia).

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<sup>4</sup> Kaplan, Michael (editor). *Essential Works of Pavlov*. Bantam Books, NY. 1966, page 385.

<sup>5</sup> From 1924 to 1933, training in KSM was for four years, from 1934 to 1938 five years, and from 1939 onwards six years.

<sup>6</sup> Graduates of 1940 from KSM were seven: Daoud Mustafa Khalid, Sulaiman Modawi, Mohamed Ali Ahmed, Mohamed El Khair El Shafie, Abdel Rahim Mahmoud, Abdalla Dusugi Abdalla, and Muwafi Abdel Fattah.

<sup>7</sup> Mr. JS Hovel was the first gynaecological specialist. He had qualified in Edinburgh in 1922 and joined the Service in 1926. In the same year he had become a Fellow of the Royal College of Surgeons of Edinburgh. He obtained his appointment as specialist in 1933 and in 1947 became a Fellow of the Royal College of Obstetricians and Gynaecologists, the only member of the SMS to attain this honour. On retirement in 1948, he settled in Darlington as a consultant obstetrician and gynaecologist in the National Health Service. (Squires, Herbert Chavasse. *The Sudan Medical Service: An Experiment in Social Medicine*. London: Heinemann Medical Books, 1958: pages 55-56.

<sup>8</sup> RM Humphreys received his training at Oxford and St. Thomas' Hospital. He had qualified during the war and had seen service in Persia. He arrived in the Sudan in March 1921. Nine years later he was appointed Senior Physician. He was the second lecturer in Medicine at the Kitchener Medical School and on Hill's retirement he became Director of the Khartoum Hospital. He himself retired in 1944 and so held the post of Senior Physician for over fourteen years which is about equal in time to the total of all other British holders of the post. During his association with the Kitchener School he had helped in training nearly seventy graduates and had seen the School attain recognition from the London Colleges. (Squires, Herbert Chavasse. *The Sudan Medical Service: An Experiment in Social Medicine*. London: Heinemann Medical Books, 1958: pages 49-50.

<sup>9</sup> FS Mayne had obtained his medical degrees at Queens University, Belfast, and he was a Fellow of the Royal College of Surgeons of Edinburgh. He had had considerable surgical experience when he succeeded Grantham-Hill in 1933. He continued as Senior Surgeon and Lecturer in Surgery until 1944 when he was forced to retire after a gallant struggle against ill health. (Squires, Herbert Chavasse. *The Sudan Medical Service: An Experiment in Social Medicine*. London: Heinemann Medical Books, 1958: page 53.

<sup>10</sup> EWT Morris joined the Service in 1929. A keen polo player he spent much of his service in the Southern and Western Provinces of



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the Sudan. In 1944 he succeeded Mayne in the twin posts of Senior Surgeon and Lecturer in Surgery which he held for five years until 1949, when he was succeeded by F. Bartholomew. He was a Fellow of the Royal College of Surgeons of England and on his retirement he took a post in the Anatomical Department of his old hospital, St. Thomas'. [He taught anatomy in the Faculty of Medicine, University of Khartoum in the 1960s]. (Squires, Herbert Chavasse. *The Sudan Medical Service: An Experiment in Social Medicine*. London: Heinemann Medical Books, 1958: pages 53, 54, 55.

<sup>11</sup> Professor HV Morgan was born in Swansea, South Wales and educated at Monkton Combe School. He was a scholar of Gonville and Caius College Cambridge, obtaining first Class honours in the Natural Science Tripos. He entered St. Bartholomew's Hospital - London in 1937 with the combined Universities Entrance Scholarship. He obtained the Kirkes Scholarship and gold medal in clinical medicine in 1939 and the Brackenbury scholarship in medicine in 1940, when he graduated (MB BChir) from Cambridge. In 1941, he obtained the diploma of MRCP, London.

He worked as house physician on the Medical Professorial Unit - St. Bartholomew's Hospital 1940-41; then as medical officer to the MRC Emergency Blood Transfusion Service and Junior Demonstrator of Pathology before returning to the Medical Professorial Unit as Chief assistant to Professor RV Christie.

From 1944 - 1946 he served as a major in the New Zealand Medical Corps in the Central Mediterranean Forces.

After demobilization, he was appointed First assistant on the Medical Professorial Unit - St. Bartholomew's - a post which he held until he came to the Sudan.

In 1948 -1950, he was British Postgraduate Medical fellow in Medicine to Canada and the United States.

In 1952, he came to Khartoum as the first Professor of Medicine in the University College, and was Dean of the Medical Faculty 1955-1958. His published work includes articles on Serum hepatitis, penicillin, onchocerciasis, and skin diseases. He is a member of the Association of Physicians of Great Britain and Ireland, the Nutrition Society and the British Association of Dermatology. He was elected a fellow of the Royal College of Physicians in 1955. (Obituary, Sudan Medical Journal).

<sup>12</sup> Suleiman S. Fedail. Remembering Professor Daoud Mustafa in ward B1, Khartoum Teaching Hospital. Solicited message for this book, September 2009.

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- <sup>13</sup> Dr. Mohamed Nagib Abdalla. The Medical practice of the late professor Daoud Mustafa (sources Professor Bashir Arbab, Professor Hussein S Abu Salih and Others). Unpublished testimonial 2009.
- <sup>14</sup> Nagib. Op. Cit.
- <sup>15</sup> Nagib. Op. Cit.
- <sup>16</sup> Nagib. Op. Cit.
- <sup>17</sup> Nagib. Op. Cit.
- <sup>18</sup> Abdel Rahman Mohamed Musa. The Department of Medicine: A Fifty Years' Witness. Paper prepared for Daoud Commemoration in December 2009.
- <sup>19</sup> Dr Jack B. Christopherson (1868-1955).
- <sup>20</sup> Musa. Op. Cit.
- <sup>21</sup> Musa. Op. Cit.
- <sup>22</sup> Fedail. Op. Cit.
- <sup>23</sup> Fedail. Op. Cit.
- <sup>24</sup> Fedail. Op. Cit.
- <sup>25</sup> Musa. Op. Cit.
- <sup>26</sup> Fedail. Op. Cit.
- <sup>27</sup> Musa. Op. Cit.
- <sup>28</sup> Mohamed Ahmed Hassan and Abdel Gadir El Kadarro. Daoud Mustafa: a model of educational excellence and moral integrity. Testimonial in the occasion of FOM, UOK Commemoration of Professor Daoud Mustafa, December 2009.
- <sup>29</sup> Haseeb, M.A. *A Monograph on Biomedical Research in the Sudan*. Volume 1: Introduction and Bibliography. Khartoum University Press, Khartoum, 1972. Page 13.
- <sup>30</sup> Stack laboratories were built to commemorate the death of Sir Lee Stack who was assassinated in Egypt in 1924.
- <sup>31</sup> Bayoumi. Op. Cit. Page 100.
- <sup>32</sup> D'Arcy. Op. Cit.
- <sup>33</sup> Mohamed Ahmed Hassan and Abdel Gadir El Kadarro. Op. Cit.
- <sup>34</sup> Ali Bedri. Foreword. Sudan National Formulary. Sudan Medical Council, 1979.
- <sup>35</sup> Abbot, P.H. (Compiler). *The Sudan National Formulary*. 84 pocket size pages and index. Published by the Ministry of Health, Khartoum in 1955. McCorquodale & Co. (Sudan), Ltd. 84 pages plus an index.

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This Formulary had been compiled with the assistance of senior members of the Ministry of Health and of the Kitchener School of Medicine. It has been approved by the Minister of Health for use as a handbook for prescribers in Government hospitals and institutions and, in time, the supply of drugs to such institutions will be based on it.

The current editions then of the British Pharmacopoeia (B.P.) and the British Pharmaceutical Codex (B.P.C.) were still in official use in Sudan as standards of purity and prescribing for pharmacists practicing outside Government hospitals and they were not replaced by this Formulary.

The prescriptions and preparations in the Formulary have been based on the Pharmacopoeia of the Egyptian Hospitals 1946, and the National Formulary of Great Britain 1952.

<sup>36</sup> Sudan Government. Sudan Medical Service Regulations, 1930. McCorquodale & Co. (Sudan), Ltd. Pages 67-71.

