

GROOTE SCHUUR HISTORY PROJECT

This paper is part of a larger project on the history of Groote Schuur Hospital from 1938 to 2008, which will be published later this year. The team consisted of the author, Anne Digby, Howard Phillips and Kirsten Thomson, with some early input from Inez Stephney.

THE 'FIGHTING ARM OF THE MEDICAL PROFESSION': A HISTORY OF CLINICAL RESEARCH AT GSH, 1938-2008

Harriet Deacon

Introduction

This chapter offers a general history of clinical research at GSH between 1938 and about 2008. We use term 'clinical research' as it was defined in the Cohen Report on British Clinical Research in 1953 to mean research 'into the mechanisms and causation of disease, including its prevention and cure ... not simply work on patients in hospital but also field studies in epidemiology and social medicine and observations in general practice'.¹

Clinical research undertaken at GSH or by GSH staff has been reviewed in a number of works about UCT Medical School, focusing on the pre-1990 period.² This chapter will focus on identifying general trends in clinical research done by GSH staff. The focus will be on understanding how the production of research was affected by its social context and the professional or institutional environment. Not all breakthroughs in clinical research can be mentioned in this chapter: key research findings will be mentioned only as examples of trends and influences. To evaluate the quality and impact of GSH research on clinical practice, more detailed, discipline-specific analyses are required.

In the late 1950s clinical research became central to the professional and institutional identity of GSH and UCT Medical School,³ justifying GSH's role as an academic hospital and enhancing the status of staff members within the international scientific community. In subsequent years, building on early research strengths, researchers on the joint staff of these institutions contributed significantly to international scientific understanding of malnutrition, diabetes, neonatal care, heart and liver disease, among others. However, by the 1990s, as provincial health services reoriented their funding towards service provision, and medical schools focused on teaching,⁴ clinical research enjoyed a lower profile and fewer resources in the hospital. The patient profile changed as GSH shifted from being a general hospital to a tertiary hospital. Research output declined, but because other institutions struggled with the same problems, GSH maintained a leading national research status.

This chapter will discuss how national and provincial government priorities affected funding decisions for hospitals, the balance of tasks allocated to hospital staff, and to

what extent research was prioritised. Other influences on clinical research at GSH included trends in international research, collaboration with international research centres, medical professionalisation, technological advances, social factors like racism or gender bias, individual interests and capacities, the disease profile of patients, and the quality and availability of research support and record-keeping. First, however, we will discuss the focus and meaning of scientific research within a broader examination of science, identity and social ideologies of race and gender.

Science, identity and ideology

Dubow suggests that science was particularly important in the development of a liberal white South African national identity in the early twentieth century.⁵ J.C. Smuts used national scientific achievements to position South Africa as a nation deserving of respect and independence from Britain within the Commonwealth, and as a nation capable of bringing western 'civilisation' to the country through industrial development and judicious handling of 'the native question'.⁶ Medical research was seen as playing a particular role in potentially returning 'to the rest of the world some of the benefits which she has received from the development of scientific research in overseas countries.'⁷ What made South Africa marketable in this context was the country's unusual, if not unique, combination of a developing-world burden of disease, diseases of the urban middle class and a good scientific and clinical infrastructure.

After 1994, the nature and quality of scientific research continued to be important in the debate about South Africa's 'new' national identity, and its intellectual and political standing in the world. In 1996, Thabo Mbeki as Deputy President envisaged a key role for science and technology in aiding the intellectual and spiritual renewal of Africa – the 'African Renaissance'. The Growth, Employment and Redistribution Strategy (GEAR) placed significant national emphasis on growth, employment creation and competitiveness.⁸ The South African Department of Science and Technology sought to promote representivity in national research capacity to 'achieve excellence in science that is uniquely South African with a global competitive edge'.⁹

There is, however, some tension between the aim to maintain global competitiveness especially in relation to science in wealthy western countries, and focusing on locally-relevant research. This tension, coupled with political polarization over the role of science in the AIDS issue,¹⁰ has constrained serious debate about how to position scientific research and its future role in a democratic South Africa. English-speaking historically white universities such as UCT are blessed and burdened in different ways by anglophile liberalism, which is associated with a firm trust in the objectivity of science and a reluctance to sacrifice academic freedom. Introspection about the influence of Apartheid and colonialism on the UCT Medical School or GSH has thus focused mainly on questions of segregation and exclusion in the running of the institutions as clinical and teaching centres – and not on research.

In exploring the professional, social and institutional factors that affected clinical research at GSH, it is interesting to explore in what ways clinical research was affected by racism, since this is a major theme of the historiography of South Africa. In the 1920s and 1930s, following Dart at Wits, Matthew Drennan's anatomical research and lectures

at UCT Medical School presented the Bushman (or San) as 'one of the lowest of the human races' and as anthropological relics who were not part of the evolutionary path taken by whites.¹¹ Skull and pelvic measurements were among the tools used to define and interpret racial typologies. It was some time before challenges to the scientific validity of the concept of race in the 1930s began to erode the assumptions behind racist science even in liberal universities like UCT. Dubow argues that '[r]acial myths proved hardwearing and adaptable'.¹²

Heavy reliance on funding from government and mining houses made scientific research in South Africa sensitive to national policy and industrial needs. But Apartheid itself did not rely on scientific justifications for racism, and its proponents relied more on cultural or religious than biological explanations for racial difference.¹³ Scientific research that was valued and validated in the developed world was also important to the Apartheid government.¹⁴ The Apartheid government and its agencies were partisan or narrowly focused on their electorate in some research funding decisions,¹⁵ but funding was not denied to broad-based clinical research.

Thus, clinical research at GSH was not generally used as a justification for Apartheid or white supremacy in the post 1940 period. GSH and UCT were in fact supported by a racist government in positioning their clinical research within the growing international ideal of universal scientific research, in which racial differences existed (but were not explained by) immutable and hereditary racial typologies.¹⁶ By following the international orthodoxy on race, clinical research at GSH established the scientific reputation of the institution and its doctors, and confirmed its liberal reputation for providing a broad public service across colour lines. Yet even as explicit racism became unacceptable in scientific publications, racial discrimination at a social level continued to influence the way in which research data were investigated, and (alongside gender and class) influenced who would be likely to be employed to do research, and in what professional capacities. A few points will suffice here, on which further investigation is required.

Interest in comparing disease patterns across racially-defined groups was firmly entrenched prior to Apartheid. South Africa presented medical researchers with a situation in which diseases of poverty existed alongside diseases of plenty, a situation which persists in many respects today. Apartheid-era race and class inequalities, alongside cultural or genetic factors, created different patterns of disease in racially-defined datasets and affected who came to public hospitals. Black South Africans, for example, were particularly affected by malnutrition, tuberculosis, cleft palate, ascariasis, oesophageal cancer, and iron-deficiency anaemia.¹⁷ White South Africans showed higher rates of coronary heart disease, diabetes, and myocardial infarction (heart attacks).¹⁸

Much of the clinical research across South Africa focused on the differential prevalence of various conditions among black and white South Africans. This interest persisted after 1994. Indeed, racial nomenclatures have gained new life and new meaning in South African society in the context of affirmative action and redress. Around half of the articles published in the SAMJ in the three years after 1994 still made reference to racial categories.¹⁹ Explanations for racial differences in disease patterns in South Africa (and

elsewhere) tend to over-emphasise the role of genetic or environmental factors in creating these differences.²⁰ They continue to underplay the importance of differential access to health care or the chronically stressful impact of racism and socio-economic inequalities on health.²¹ In many cases, social class or other factors may explain variation better than race.²²

Using racial categories in research is not necessarily racist in itself, however. Some excellent research has sought to lay bare the health consequences of Apartheid in the 1970s,²³ and work tracking the impact of more democratic health policies needs to continue. Even under Apartheid, some of the work that compared racial categories ascribed differences to environmental factors arising from discrimination. Linking social inequality to health inequality was a feature of the discourse of social medicine in South Africa's public health initiatives of the 1940s, which faded under Apartheid²⁴ but may have left an intellectual, if not an institutional, legacy. In 1949, in a paper on mortality and morbidity patterns among 'the Cape Coloured People' Brock ascribed high rates of 'social diseases' in coloured communities to sociopolitical circumstances such as poverty associated with low wages, poor education and discriminatory legislation.²⁵

The context of the anti-Apartheid struggle affected what topics were chosen for research, especially in the 1970s and 1980s. Some researchers emphasized the need for debate about ethics, or actively opposed Apartheid policies. Folb, Clarke and Kirsch, for example, reported the negative health effects of the demolition of an informal settlement called Unibell on residents in 1978.²⁶ The academic boycott also played a role in conscientising researchers who did not initially take a stand against apartheid by the 1970s.²⁷ It was first proposed by exiled South African students in the 1950s,²⁸ promoted by the anti-apartheid movement in the 1970s and intensified in the 1980s. The ANC-aligned National Medical and Dental Association (NAMDA, formed in 1984) supported the boycott because it was frustrated not only by the racist attitudes and practices of government supporters, but also at what they saw as lip-service being paid to the anti-apartheid struggle by liberal white academics who wished to carry on with academic business as if South Africa were a normal society.²⁹ It advocated the 'discouragement of all cultural and scientific events except where these contribute towards the end of apartheid or have no possible role in promoting it',³⁰ and 'selective support'³¹ for certain progressive initiatives.

The academic boycott threatened the relationship GSH staff had worked so hard to build between themselves and international networks. In 1977, for example, the Professor of Paediatrics, 'Boet' Heese, reported on his study tour to the United Kingdom, West Germany and Scandinavia as follows:

[O]ne was struck by how isolated paediatricians in the Republic have become in participating on an international level in the planning and provision of health services for children. The developing countries do not wish to be associated with South Africa and it was my distinct impression that, perhaps more than before, the developed countries of the world avoided official contact with us where possible. Through informed opinion, it would appear that the same attitude prevails in the World Health Organisation.³²

One of the issues was racially-based salary discrimination: Heese thus pressed the UCT Faculty of Medicine to use UCT funds to address the issue for joint staff.³³ Under pressure from delegates in the World Medical Association on the same issue, the Medical Association of South Africa withdrew from a meeting in Brazil and resigned from the World Medical Association in the same year.³⁴ By 1990, however, South African scientists were gradually welcomed back into the international academic fold.³⁵

Until the 1980s, most clinical staff at GSH were white men, with a smattering of white women as doctors and research assistants; some black men, such as Hamilton Naki,³⁶ later honoured by UCT for his surgical skills,³⁷ were employed as laboratory assistants. There were significant race, class and gender barriers to someone with enormous natural talent like Naki becoming a surgeon or moving to a job better paid than a laboratory assistant. This may have ironically benefited the surgical research programme. There were also significant barriers to black doctors specialising and entering the field as researchers. The enforcement of Apartheid regulations that prevented black medical students from attending white ward rounds at GSH, or dissecting white bodies at UCT Medical School made it difficult for them to benefit from the full teaching input, or to feel comfortable within the hospital after graduation, when they were still restricted to junior positions and seeing only black patients.³⁸ There were professional and legal barriers to specialist practice for black doctors in Cape Town (and GSH) as late as the 1970s,³⁹ which would have prejudiced the development of a cadre of black specialist researchers locally.

There were not as many barriers to the employment of white women at GSH. Golda Selzer remembered that in the 1950s Van den Ende initially did not want to employ her in a senior position in the Department because she was a woman. However, he was overruled by his superior, T.B. Davie.⁴⁰ There were soon a number of women in senior posts, although many women remained in the background – such as the ‘mature ladies’ who were back-up assistants in the biochemical and histological laboratories.⁴¹

The skewed distribution of race and gender in scientific research has been slow to change across South Africa: ‘the majority of scientists in the publicly funded institutions are still white men’.⁴² Between 1984 and 1995, the proportion of Africans increased from a miniscule 1% to only 4% of permanent teaching and research staff at UCT as a whole.⁴³ Given this history, GSH is fortunate today to have black doctors with strong research backgrounds at the helm of the Departments of both Surgery and Medicine. In South Africa as a whole, while the proportion of women researchers in tertiary institutions has increased, most of them were white even in 2001,⁴⁴ and they tended to be concentrated in less senior positions.⁴⁵ But compared to the basic sciences and engineering, this pattern was less marked in the health sciences, where women have been better represented as doctoral students and faculty members, and in fact received a majority of self-initiated research grants from the Medical Research Council between 2000 and 2002.⁴⁶

Given that most GSH researchers were white, and male, social bias and status differentials between doctors and patients may have affected the conduct of clinical research at GSH. In 1995, Benatar suggested that language barriers between doctors and patients in South Africa were likely to be a major barrier to ‘informed clinical

communication and adequate patient understanding' although only a quarter of the doctors he sampled perceived language as an obstacle to informed consent.⁴⁷ As late as 1981, GSH had only one official Xhosa interpreter, in the Department of Medicine, although it had 100,000 African patients annually.⁴⁸ Language, cultural background and social class may thus have created significant barriers to mutual understanding between doctors and research participants.⁴⁹

The relevance and value of clinical research at a tertiary institution like GSH and in a developing country like South Africa is currently hotly debated. The critique of hospital-based medicine began slowly, with more attention being paid to public health in the 1970s and 1980s. GSH clinical research in this period tended to be focused on specific diseases which could be treated at the hospital. Some clinical research, such as that on porphyria, catered mainly to the needs of people – in this case white Afrikaners and a small pocket of Africans - with specific genetic defects.

The relevance of certain disease studies to the general population also changes over time, however. Heart disease was initially seen as affecting mainly white Afrikaners, who suffered from high cholesterol. By the late 1980s, heart transplants and cardiology research were represented as expensive tertiary-level, 'first world' interventions that would mainly benefit wealthy white patients.⁵⁰ But many poor black communities suffered from heart problems because of the high incidence of rheumatic fever.⁵¹ Heart disease, cancer, diabetes and obesity also became more common in the general population as the black middle class became urbanized and sedentary, took up smoking, and adopted an unhealthy high-fat, refined-carbohydrate diet.⁵²

In conclusion, scientific research has been valued by successive governments in South Africa as a statement of national competence and pride. Clinical research has been the main route for GSH clinicians to establish their professional and scientific status, which has until quite recently been defined primarily in relation to their compatriots in the US and UK. Explicit racism in scientific writing predated Apartheid, and was largely discarded by the 1940s, but social racism and the Apartheid context continued to affect who did research on whom, how the data were organized and to some extent what topics were chosen. These broader social and ideological influences on clinical research at GSH form the background to a discussion of other factors that influenced research focus and quantity in the period after the hospital opened in 1938. Makgoba and Seepe suggest that continued white dominance of research positions and agenda-setting in higher education institutions, and a long history of cultural and intellectual colonialism within the academe will mean that research agendas continue to be set by international priorities rather than national needs.⁵³ But the nature of national needs is changing rapidly as South Africa develops more 'first-world' problems.

Establishing GSH as a research institution, 1938-1955

Sustained government funding and university investment in scientific research was a precondition for the expansion of research activity in American universities after World War II.⁵⁴ In South Africa, although there was less in the way of private funding and fewer total resources than in the US or UK, UCT was fortunate to have been an early beneficiary of a similar confluence of state and institutional interests. The South African

government established a permanent structure for funding medical research under the Council for Scientific and Industrial Research (CSIR) in 1945, a few years after GSH had been established. The CSIR followed in the wake of initiatives like the Colonial Bacteriological Institute (1891) and the South African Institute for Medical Research (SAIMR), established in 1912 through an agreement with the Chamber of Mines.⁵⁵

Louw describes the UCT Medical School rather optimistically as ‘one of the best in the clinical field and also ... a recognized research centre’ by 1950.⁵⁶ UCT Medical School was, however, initially focused on turning out medical practitioners rather than researchers.⁵⁷ Drennan (Professor of Anatomy), Saint (Professor of Surgery until 1946) and Ryrie, (Professor of Pathology from 1925 and in 1948 the Medical Faculty’s full-time Dean), all placed a strong emphasis on clinical practice rather than research.⁵⁸ Thus, in the first decade after the establishment of GSH, hospital staff, mostly part-time or honorary appointments, concentrated on teaching and their clinical work.

There was little in the way of research funding, even at the UCT Medical School. Some research, mainly in the preclinical departments, - on malnutrition, infectious diseases such as brucellosis, physical anthropology, plant and animal poisons, and diagnosis of human pregnancy using frogs - was already being done in the Medical School in the 1930s.⁵⁹ This focus on preclinical research before World War II was echoed at the University of the Witwatersrand (Wits) Medical School.⁶⁰

Unlike many of his colleagues, physiologist W.T.A. Jolly promoted original research at UCT Medical School in the 1930s. He believed that one of the primary functions of a medical school was to do research. In his wartime-inspired phrase, research was the ‘fighting arm of the medical profession’.⁶¹ Working with Marshall, Jolly was the first to prepare an active extract of the ovary - ‘an initial step of immense importance in reproductive physiology’. Jolly also contributed to the development of electrocardiography, initially through his work for the Defence Force in World War I.⁶²

Partly because of Jolly, UCT researchers had more access to funding for medical research through bequests and active fundraising by the 1940s.⁶³ A fund in memory of Jolly promoted research in physiology.⁶⁴ J.S. Marais gave money to UCT for surgical research and the mining magnate J.B. Robinson funded cancer research,⁶⁵ which established a chair in Radiology. This funding was limited. When Goetz arrived as a laboratory researcher funded by the J.S. Marais grant in 1937, he was told to finance his own research.⁶⁶ Later, Schrire and Nellen paid for their first ECG machine out of their own pockets.⁶⁷ Similarly, as a postgraduate student at Wits Medical School in the 1940s, Sydney Brenner complained that ‘if you wanted to stain something, you first *synthesized the dye*’!⁶⁸

J.F. Brock also played a major role in promoting research at GSH and UCT. Brock found few research facilities when he arrived as Professor of Medicine in 1938.⁶⁹ Before leaving his well-resourced post as full-time assistant-director of Research in Medicine at Cambridge University, he had sought assurances that he would have facilities and support for research. But those who gave him these assurances ‘had absolutely no idea of what

was involved in providing material and financial resources for medical research.’⁷⁰ Brock then worked hard to secure funding and space for research activities.

During the twentieth century, the link between nutrition and health became a major concern in rich and poor countries alike. The UK’s Medical Research Council focused strongly on nutrition research after World War I.⁷¹ In South Africa, government and industry focused on mineworkers and poor whites, especially children.⁷² The Cape Coloured Commission of 1937 raised specific concerns about malnutrition among coloured people in the Cape.⁷³ In 1939, the Union Department of Public Health therefore commissioned J.F. Brock to investigate malnutrition in the coloured community.⁷⁴ In 1950, after Brock argued convincingly that kwashiorkor was caused by protein malnutrition,⁷⁵ he was seconded to the WHO to study the clinical features, aetiology and ecology of kwashiorkor throughout Central Africa.⁷⁶ He then did collaborative research in the United States, at Minnesota, and continued his work with the WHO.⁷⁷ This work led to his appointment in 1949 as Director of the CSIR Clinical Nutrition Research Unit at UCT.⁷⁸

Brock promoted research at GSH by conducting his own research on malnutrition, encouraging colleagues and students to do research, publishing about research and raising money for it.⁷⁹ A year after his arrival, he had already begun to argue in the *SAMJ* that clinical research needed to be closely linked to both medical education and medical practice.⁸⁰ He shared his appointment as Head of the Department of Medicine with Frank Forman, a man famous for his diagnostic and clinical skills.⁸¹ Although there was some tension between the clinically-oriented Forman and the Brock camp,⁸² and Forman eventually resigned his chair because of tension between them,⁸³ Forman also encouraged his students and assistants, including Lionel Berk, Graham Bull and Val Schrire, to do research.⁸⁴ Yet research activity was slow to gain momentum. When Peter Jackson arrived from Britain as Forman’s assistant in the Department of Medicine, for example, he found little research being done besides Brock’s nutrition studies, and no research technicians or research instruments. Crichton said he thought Jackson’s diabetes research idea was ‘complete nonsense’, but gave permission for him to do his research anyway.⁸⁵

Jackson had the assistance of two women technicians, Betty Scholtz and Peggy Hofmeyer, employed as teachers in the E-floor laboratory, who were allowed to perform glucose tolerance tests for him.⁸⁶ Jackson used this work to develop the concept of pre-diabetes in a paper published in 1952, which had international impact.⁸⁷ This led to further research because there were interesting differences within the South African population in terms of diabetes prevalence, and a very high rate of late-onset diabetes among South Africans of Indian origin.⁸⁸ A project to screen Indian South Africans for diabetes in the Cape Peninsula was later funded by the United States Public Health Service in the mid 1960s.⁸⁹

There were strong collaborative research relationships between people in preclinical departments at UCT (such as Robert Goetz, and Budtz-Olsen in Physiology) and those in the clinical departments.⁹⁰ Goetz earned an international reputation for his work on digital plethysmography, the sympathetic control of peripheral blood vessels, Raynaud’s

disease, diabetic gangrene and progressive systemic sclerosis.⁹¹ His plethysmography work assisted in the diagnosis of peripheral vascular disease.⁹² This diagnostic work was initially based at UCT Medical School, but relied on GSH referrals from 1938 and became even more integrated with the work of the hospital after his appointment on the joint staff after the War.⁹³

Goetz and others of this era often made or modified their own equipment – he developed the first photo-electric plethysmograph for his vascular diagnostic work and made a 6-channel recorder for catheterisation procedures before it was available commercially in the 1950s. Given the restrictions on funding, it is significant that Goetz relied on the (largely unpaid) assistance of his wife in the early years. She was trained as a physician, and was involved in doing the laboratory work and keeping the clinical records on a punch card system.⁹⁴ By 1954, the research team had assessed a large number of patients with vascular disease using these techniques and when Barnard came back from Minnesota with a heart-lung machine they were ready for surgery. After surgery, the GSH team reported a very low rate of rupture because Goetz had devised wider than normal iliac limbs on the grafts.⁹⁵

There was also collaborative work between technicians and researchers. The task of developing, adjusting and maintaining diagnostic equipment was taken up in the 1950s and 1960s by senior technicians, such as Goosen and Piller, who worked in the Cardiac Clinic and continued to develop new ideas. The 1979 Nobel Prize in medicine was a joint award for computerized tomography, shared by a South African (Alan Cormack) who became interested in the mathematical problem of creating a correct radiographic cross-section in a biological system when he worked as hospital physicist at GSH in the mid-1950s. A British computer specialist later used Cormack's ideas to develop the first CAT scanner machine.⁹⁶

Improvements in funding were soon coupled with the establishment of a larger corps of full-time clinical staff replacing many of the part-time honorary clinical lecturers in the late 1940s. This trend was cemented by the 1951 Joint Staff agreement. This agreement encouraged a close working relationship between the Medical School and GSH, and support from the Provincial administration for research functions in the hospital. This was similar in its effect on clinical research to funding arrangements in the UK in which universities paid for laboratories and overheads and the Medical Research Council or charitable funds paid, if only initially, for direct research costs, although as in South Africa, this arrangement later collapsed.⁹⁷

After some teething problems in the early 1950s,⁹⁸ a synergistic relationship between full-time and part-time doctors at GSH encouraged clinical research at GSH, as it did in Germany and America.⁹⁹ Booth argues that conflict between full- and part-time medical faculty staff in England, the continued power of the part-time teacher, and the consequently greater separation between clinical work, teaching, and basic medical research, had a negative effect on clinical research there in the early to mid-20th century.¹⁰⁰ This conflict was reduced with the introduction of the National Health Service in the late 1940s, which provided salaries to honorary part-time consultants and allowed them to do research alongside full-timers.¹⁰¹

GSH enjoyed relatively stable, congenial relations between part-time 'sessional' doctors (who worked in private practice as well), and full-timers. Part-time sessional staff relieved full-timers of the full burden of clinical work without restricting their access to clinical teaching and research. In 1960, Brock reflected on the benefits of appointing salaried medical staff under the Joint Staff Agreement:

The most significant effect of this new system has been [that] men of high academic achievement and research potential are more frequently being attracted into full-time appointments. There they can devote their thinking to the raising of standards and the advance of knowledge without the inevitable distractions of private practice. A real partnership between full-time and part-time staff has developed and brings mutual benefit. The influence of the part-time men prevents any tendency to ivory-tower outlook and keeps the real and total needs of the patient in the forefront of attention. The presence of full-time men, who are productive in research, constitutes a continual challenge to replace outworn concepts by new ideas.¹⁰²

Brock believed that medical research should incorporate both clinical and laboratory work and that the clinical research beds should be in small wards in the hospital, close to research laboratories.¹⁰³ In contrast, full-time staff at the University of the Witwatersrand Medical School, initially had restricted access to hospital beds.¹⁰⁴ This was reminiscent of the British model in which hospital beds were controlled by part-time consultants who opposed the intrusions of clinical research staff at teaching hospitals in the 1950s.¹⁰⁵

As in American medical schools in the first few decades of the twentieth century,¹⁰⁶ maintaining this amicable relationship depended on achieving a balance between private and full-time hospital practice in terms of income and other benefits. As early as 1937, the Committee for Medical Education under M.C. Botha had declared that 'unlimited private practice' for full-time professors should be restricted because it meant 'that they have neither the time nor the inclination for serious research'.¹⁰⁷ Limitations on private practice had thus been imposed on joint staff at GSH from 1951, unlike Stellenbosch academic hospitals in the late 1950s, where professors were initially allocated hospital beds for private practice.¹⁰⁸ This encouraged harmonious working relationships between full- and part-time staff. In Cape Town it was also easier to attract experienced full-time clinical professors to academic hospitals than in Johannesburg,¹⁰⁹ where there was a more lucrative and professionally assertive market for private practice.

Although the good relationship between full- and part-time staff at GSH favoured research, key government-funded research centres and major commercial interests were concentrated on the Witwatersrand. Witwatersrand Medical School benefited from close relationships with both,¹¹⁰ whereas for UCT it was less easy. The SAIMR and CSIR headquarters were both on the Witwatersrand. The SAIMR had a close relationship with the Medical School of the University of the Witwatersrand and the Johannesburg General Hospital, but less formal collaboration with UCT and GSH.¹¹¹ Their branch laboratory system covered other parts of South Africa and even Namibia (then South West Africa), but did not cover Cape Town, as there were already laboratories there.¹¹² A number of national research institutes were established on the Witwatersrand, including a National

Nutrition Research Institute for the CSIR (established in 1954), which UCT had originally hoped to host under Brock.¹¹³ Research on polio vaccines was undertaken on the Witwatersrand at the Virus Research Institute from 1951, later renamed the National Institute for Virology.¹¹⁴

Because of their location away from the centre of business finance and centralised government research institutions, UCT and GSH thus supported the CSIR's decision in 1948 to decentralize some of the research funding.¹¹⁵ This drew from similar models in the British Commonwealth and the US,¹¹⁶ expressed for example in the Cohen Report of 1953 which recommended a central organisation for research promotion and training, alongside decentralised research units.¹¹⁷

The CSIR built on existing initiatives to set up research units in the various medical schools, funding a virus unit, a nutrition unit and a cardiopulmonary unit at UCT. For example, the Virus Research Unit was established under Marinus van den Ende at the UCT Department of Bacteriology in 1950. Here, researchers in this Unit, including Van den Ende, Kipps and Polson, worked on a number of viruses, including arboviruses and hepatitis, and made noteworthy contributions to understanding the complications of measles, encephalitis and adenovirus pneumonia.¹¹⁸ They worked on identifying the structure and density of virus particles, on the purification of viruses, and helped develop techniques for producing refined influenza vaccine.¹¹⁹ This research was located more in the laboratory than in the hospital, although the pathologists used human tissue. Golda Selzer was the first to isolate the rubella virus from human tissue, and later also worked out the structure of the polio virus with Polson, before the electron microscope was widely used.¹²⁰

The rise in research output, 1955-1985

From the mid 1950s until the mid 1980s, there was a marked increase in government and university support for research at GSH. The CSIR soon became the major source of research funding at SA universities.¹²¹ In 1969 the CSIR handed over its role in funding medical research and managing its national research units to the newly-formed Medical Research Council.

At a provincial level, the Joint Agreement in 1951 gave the CPA (Cape Provincial Administration) financial responsibility for the care of the sick in the teaching hospitals, while the University shouldered the burden for teaching and research. However, these activities were not easily separable, and the percentage contribution from each institution was calculated using an estimate of the overall activities of the Joint Staff. Perhaps because of this, no specific limitations were imposed on the time individual members of the Joint Staff spent on clinical work, teaching or research.¹²² This flexibility in how staff members spent their time, coupled with stronger institutional and financial support for research, facilitated clinical research activity in the 1960s.

In the 1950s and 1960s, the growing emphasis on clinical research as a measure of academic quality led to the hospital and the university making greater demands for institutional support from the CPA. A UCT Faculty of Medicine Commission of Inquiry into medical research in 1954 applauded the greater amount of research being done since

1950 but complained about the Province's low financial commitment to research where it was not directly linked to patient needs:

[The [Provincial Administration] is aware of the need for medical research but is reluctant to provide special facilities or to contribute directly towards research which it tends to regard as falling in the sphere of higher education and therefore a responsibility of central government. The Provincial authorities should be permitted and encouraged to give direct support to medical research particularly in its teaching hospitals.¹²³

In 1956, the Joint Staff Advisory and Executive Committee (JSAEC) of GSH argued that it was difficult to distinguish between research that was of 'remote benefit to the patient' and 'special investigations of which the benefit to the patient are immediately obvious'. They emphasized the importance of 'adequate facilities for [clinical] research' at GSH, while saying they would leave 'pure' research to the University.¹²⁴

Their pleas fell on fertile ground from the mid 1950s to the early 1970s. The CPA began to pay more attention to research needs in planning hospital restructuring in the mid 1950s,¹²⁵ and in allocating funds to research projects at the hospital by the late 1950s.¹²⁶ The focus was on financing research that had clinical application, rather than experimental research.¹²⁷ By 1960, the CPA had relaxed some of the prior restrictions on the use of Teaching Hospital Board funding for research, which the THB described as 'a big step forward'.¹²⁸ The Medical Superintendent of GSH, similarly enthusiastic, looked forward to every department increasing their research output.¹²⁹ Although in 1952 the JSAEC view was that study leave for doctors at GSH should be unpaid, '*ex gratia*' and could not be taken as a right,¹³⁰ the JSAEC now pressed the CPA for further support for conference attendance because 'family men could not be expected to attend at their own expense'.¹³¹ By the mid 1960s, the CPA provided not only financial support and special leave to full-time Hospital Services medical staff for overseas study trips. The CPA also allowed local hospital facilities to be used by (white) researchers from other countries collaborating with local clinical researchers.¹³²

In the latter half of the 1950s, the JSAEC had successfully campaigned for better laboratory facilities, diagnostic services and medical record-keeping to aid clinical research at GSH. Serious attention was paid to developing a centralized, comprehensive medical record keeping system, maintained by a trained body of archivists and typists, and archived in more compact forms, such as microfilm. A large microfilming project was begun in the 1970s. Increasingly, centralised record keeping was seen as an essential requirement for the modern hospital.¹³³ In 1951, an editorial in the SAMJ underlined the point:

The classification of disease and death is pointless unless the data classified are available for useful inspection. The need to improve our hospital record systems should be pursued *pari passu* with the adoption of internationally recognised and standardized conventions. It could then become one of the corner-stones of the important developments taking place in the field of social medicine.¹³⁴

In cancer research, for example, better record-keeping enabled studies of the efficacy of treatment in GSH,¹³⁵ the development of a tumour registry and involvement in broader cancer prevalence studies in the 1970s.¹³⁶ The World Organisation of Gastroenterology appointed the GSH Gastro-Intestinal clinic to compile a registry on alpha-chain disease.¹³⁷

However, as those who sought to implement the record-keeping system soon found out, older traditions of record keeping did not die out. Researchers like Goetz and Schrire had maintained extensive private record-keeping systems, with the help of female assistants. Schrire's system, some of which remained in place till the late 1980s, included the keeping of duplicate cardiac records (the first use of such a system in the hospital), and extensive data capture on punch cards.¹³⁸ Records were difficult to retrieve from departments, and parallel record-keeping systems were often retained in clinics, such as the Cardiac Clinic. In the 1980s, a review of the x-ray record-keeping system noted that 'Medical staff are notorious for having personal collections of interesting x-rays which are then "lost" to the rest of the hospital'.¹³⁹ Even today, the Medical Records department periodically receives duplicate record-sets from departments in the hospital that date back up to twenty years.¹⁴⁰

Readily available laboratory facilities were also an essential precondition for South African participation in a growing international trend towards randomised clinical trials and statistical analyses of patient data in clinical research. Laboratory facilities, initially upgraded at Medical School in the early 1940s,¹⁴¹ were soon being upgraded and extended at GSH as well. A new Medical Research Block was opened in 1959.¹⁴² There was greater communication between laboratories and clinicians on research as well as diagnosis.¹⁴³ This went along with a national¹⁴⁴ and international¹⁴⁵ trend away from the general practice-style case studies of the 1940s and towards statistical analysis of larger bodies of case material especially in randomised clinical trials.

Use of computer equipment made statistical analysis easier. As early as 1965, the Department of Anaesthetics reported increasing research activity and commented on 'the immense value of the use of analysis by computer' in a study of the effects of various anaesthetic techniques on the infant during Caesarean Section.¹⁴⁶ In the early 1970s, the Cape Provincial Administration started establishing integrated computerized record-keeping systems in their hospitals including GSH. Greater involvement from the hospital departments characterized the second attempt at an integrated computerised record-keeping system in the mid-1980s.¹⁴⁷

The number of full-time staff in the UCT Medical School increased dramatically between 1950 and 1968. The number of associate professors and lecturers rose five fold from 23 to 103, while the number of students registered in the medical faculty actually dropped - wartime returnees had elevated student numbers after the war. The number of part-time lecturers increased by around 60%, from 128 to 208.¹⁴⁸ Even though clinical obligations at GSH also increased, full-time staff gained, and expected, more research time in this period. The Department of Ophthalmology was given research money through a bequest to UCT, but the staff did not have enough time free from their clinical duties to do the research work so the JSAEC recommended the appointment of another full-time

specialist.¹⁴⁹ The Dermatology department asked for their own laboratory for research and histological examinations as a way of improving post-graduate training and meeting 'the requirements of modern international standards' in the hospital.¹⁵⁰

In the department of Child Health (later Paediatrics), which Prof. F.J. Ford complained was still 'a despised, derided and more or less neglected branch of Medicine', staff had had little time to devote to research in the early 1950s. With concerted effort by researchers on kwashiorkor, and outside funds from the Price-Waterman Fund, the National Institutes of Health and Wellcome, the department published over 300 papers between 1953 and 1971.¹⁵¹ Much of the work on neonatal respiratory distress, which earned Pat Smythe world acclaim for his work on paralysing and ventilating infants with neonatal tetanus in 1957, was done at GSH.¹⁵² However, conflict between obstetricians and paediatricians in the hospital, characteristic of most professional systems influenced by the British model,¹⁵³ limited the extent to which GSH could provide opportunities for peri-natal research even in 1990.¹⁵⁴

Even the diagnostic services started to see research as a basic requirement for maintaining quality and staff. The Division of Pathology complained that their

commitment to maintaining a high standard of efficiency in our diagnostic service has further restricted the time available for research of a fundamental kind. Unless this trend can be reversed by guaranteed time and facilities for research we stand in danger of losing trained personnel to private enterprise, the unhappy plight of Divisions of Pathology in other medical schools in South Africa.¹⁵⁵

Publications and activities like journal clubs were soon deemed 'essential for organised development and for the maintenance of professional and academic standards' in the Medical School.¹⁵⁶ Louw comments on the emergence of departmentally-organised clinical discussion groups as early as 1950, replacing the more general 'Tuesday evening clinics' started by Berk and Bull in 1940. This latter group launched the journal *Clinical Proceedings* in 1942, a journal in which UCT Medical school staff actively published, and which was incorporated into the *South African Journal of Clinical Sciences* after 1950.¹⁵⁷

The increased investment in clinical research by the CPA, the UCT Medical School and clinicians themselves led to significant increases in GSH medical staff making conference presentations and study visits in the early 1960s, often outside the country. On the international scene, there was a mushrooming of medical congresses and specialist journals, and an increasing professional status associated with publication. World Congresses in every specialty became a flourishing business. Groups of newly-defined specialists sought to establish their academic credentials in a period of increasing sub-specialisation in medicine. GSH researchers travelled not only to meetings and centres of excellence in Europe and America, but also to places like Japan and Australia.

The geographical isolation in which South Africans are forced to work can therefore be offset by regular attendance at major overseas congresses, and such contact is essential for academic survival.¹⁵⁸

Research trips and conference visits increased so rapidly after about 1962 that in the Paediatrics department, Ford complained rather snidely that:

While the department is quite glad to have representation in such exalted circles as W.H.O. these world travellers have a job of work to do here in South Africa and it cannot be done indefinitely in absentia.¹⁵⁹

He bemoaned the ‘peculiar South African complex which compels its citizens to take frequent trips overseas at short intervals and at great expense’.¹⁶⁰ The international reputation of clinicians at the university and the hospital began to depend increasingly on presenting their research at international conferences and in international journals.

The rapid evolution of medical technology was accompanied at this time by an increased emphasis on laboratory investigations in medicine.¹⁶¹ At GSH, some of Jackson’s laboratory-based diabetes research was done in collaboration with Geoff Linder who was the first Professor of Chemical Pathology.¹⁶² But this kind of collaboration between clinicians and the laboratory was not universal. As the head of the Department of Clinical Pathology complained in the 1970s:

a minority of our clinical colleagues still regard the laboratory as a depersonalised, press-button machine, some seek our help as a substitute activity to gull themselves and their chiefs that something positive is being done for the patient, and a few clinical colleagues do not appear to relate to the laboratory at all.¹⁶³

Collaborations between biomedical engineers, technicians and clinicians worked well in the Orthopaedics Department where a special prosthesis limb was developed in about 1960. The rights to approve manufacture of the ‘UCT artificial limb’, as it was called, were given to the National Council for the Care of Cripples to prevent unreasonable commercialisation.¹⁶⁴ In 1968, Orthopaedics called for the establishment of a special unit for biochemical research to allow the study of joint fluids.¹⁶⁵

The expansion of hospital-based research and increased professional sub-specialisation could have compartmentalized medical knowledge and distanced clinical research from the management of patients, as it did in the US.¹⁶⁶ At GSH, however, there was a continued emphasis on clinicians’ involvement with patients, even in research.¹⁶⁷ There was also a strong tradition within UCT and GSH of emphasizing general expertise over specialization, both in the Department of Surgery¹⁶⁸ and with an even more enduring legacy in the Department of Medicine, under Brock, who resisted the compartmentalization of the department into specialized units. The involvement of different specialists who had a common general grounding in clinical practice turned out to be a major precondition for therapeutic innovation. The first heart transplantation, to take the most prominent example, would not have been possible without extensive interdisciplinary teamwork.¹⁶⁹ In 2003, a visiting panel of health experts said that the GSH Cancer Unit was a model environment ‘because of its numerous inter-disciplinary clinics, which ensured optimal service to patients, and maximum interaction with other specialist fields in the hospital’.¹⁷⁰

Surgical research at GSH thrived in this period, partly because of the close relationship between the animal laboratory and clinical work. Jannie Louw, Head of Surgery, encouraged research by both consultant surgeons and registrars, and insisted that full-time staff spent a quarter to half of their time on basic research in the laboratories.¹⁷¹ Louw uses numbers of publications as a rough guide to understanding research output in his study on the history of surgical research at UCT Medical School. He charts a marked increase in publications from the UCT Department of Surgery between the 1940s and 1970s (see Figure 1).¹⁷² It is difficult to provide a breakdown of publication figures per full-time staff member because of the complex system of honorary and sessional part time employees. Detailed records of staffing allocations are only now beginning to be kept by the UCT Medical School – interestingly, not specifically to measure research output, but to measure space allocations between the Medical School and the Hospital.¹⁷³

Figure 1: Number of publications, UCT Department of Surgery 1920-1979 (J.H. Louw, ‘Surgical research at the University of Cape Town’).

In the 1950s and 1960s, an era of heroic surgery,¹⁷⁴ heart, liver and kidney transplants formed the cornerstone of surgical research at GSH. GSH followed the ‘American model’ in which ‘research and animal experimentation [were] regarded as the *sine qua non* of a surgical department’.¹⁷⁵ The world’s first open heart transplant in 1967, led by Chris Barnard, was followed by other transplant firsts at GSH: Bennie Cohen performed the world’s first vascularized human fallopian tube transplant in 1975.¹⁷⁶ Cohen did his MD thesis on fallopian tube transplants in the pig and sheep, before trying it on humans.¹⁷⁷ These breakthroughs depended on clinical research, but also on international collaborations, and on technical advances such as the development of the heart-lung machine in the USA. In conducting transplants, the less litigious environment around medical practice in South Africa made it easier for surgeons to risk a ‘first’,¹⁷⁸ and controversy over the use of animals in medical research was more muted than in places like the UK.

Although there was an ‘animal house’ at the medical school from 1930, most of the early laboratory work by Goetz was focused on humans and human tissue samples. Practical experience and research at the J.S. Marais Animal Laboratory, and in the operating theatres of the hospital, assisted surgeons in the development and perfection of surgical

techniques for organ transplantation. An animal operating laboratory was later acquired for this purpose.¹⁷⁹

By the mid-1950s, clinician-researchers had already started doing vascular surgery and organ transplants on dogs.¹⁸⁰ Chris Barnard worked on puppies to develop a better way of treating congenital intestinal atresia in babies in 1954. His work led to a significant improvement in the recovery rate for infants surgically treated for congenital intestinal atresia and influenced the way researchers investigated congenital abnormalities elsewhere in the world.¹⁸¹ On his return from working with Wangenstein in the USA in 1958, and the establishment of the J.S. Marais Surgical Laboratory with an updated operating room, Barnard began an active program of organ and tissue transplantation on dogs, leading up to work on humans. However, perhaps because of a public relations disaster after Barnard grafted an extra head on one of the dogs in the laboratory,¹⁸² research funding became scarce and full-time staff at the research laboratory were only reappointed a decade after Goetz left in 1958.¹⁸³

After the heart transplant in 1967, it was easier for GSH to find funding to support cardiology research. The mining industry funded a Research Centre for Cardiac Disease and Organ Transplantation after the transplant.¹⁸⁴ The Apartheid state also supported high-tech research they hoped would prove Apartheid South Africa's worth to an increasingly critical world. In 1967, L.A.P.A. Munnik, MEC for Hospital Services, sent a message to the Prime Minister, John Vorster, saying that Chris Barnard had put South Africa and its medical standards 'on the world map'.¹⁸⁵ Barnard was later paid by a secret government fund to promote South Africa's image abroad.¹⁸⁶

Much of the later surgical and immune-suppression liver transplant research was done on pigs and rats, pigs being particularly interesting because of the low organ rejection rate.¹⁸⁷ In the 1970s, the Department of Surgery persuaded the CPA to invest in a pig farm. This became so central to their work that Louw complained in 1971, 'If the use of the pig pens had to be suspended for a period of six months the Department of Surgery will cease to exist as an academic department. Practically all our current research work has been organised on [the] basis of using the pig as the experimental animal.'¹⁸⁸

In their work on heart, liver and kidney disease, GSH clinicians and researchers were able to benefit from research in both medical and surgical disciplines. Brock's initial interest in metabolic function laid the foundation for this work in the Department of Medicine. Between 1955 and 1975, there was a marked rise in publications in the Department from 18 to 175 per annum.¹⁸⁹ Many of these publications focused on heart, liver and kidney disorders. The Cardiac Clinic alone generated around 400 journal articles in the period between 1955 and 1988.¹⁹⁰

In the Clinical Nutrition Research Unit since the 1950s, Brock, together with Bronte-Stewart, Hansen and others, had done research on malnutrition in children and scurvy among adult farmworkers. This research was used in developing Pronutro as a food supplement in the early 1960s.¹⁹¹ When Brock retired in 1970, however, the nutrition research unit closed. Kwashiorkor research continued in Red Cross Hospital, and work on protein metabolism was continued by Hoffenberg, Saunders and Kirsch who focused on

the regulation of liver protein synthesis in humans and rats. Bernard Pimstone did important research on growth hormone in protein-calorie malnutrition, showing that high levels of this hormone explained the catch up in growth on feeding. In the mid-1970s he then began to investigate the hypothalamic, rather than pituitary, hormones and together with British collaborators and his Cape Town team, provided the most convincing evidence of the time for a neurotransmitter role for somatostatin.¹⁹²

Brock's work on cholesterol also laid the foundation for later work on ischaemic heart disease. Brock and Bronte-Stewart collaborated with Ancel Keys in Minnesota who was conducting similar studies in other countries, showing that high cholesterol levels led to a high incidence of ischaemic heart disease. They found that white South Africans had high cholesterol and heart disease, while coloureds had intermediate and blacks very low levels of both. This work led to the use of cholesterol lowering diets and drugs to reduce levels of heart disease.¹⁹³ Lionel Opie's return to Cape Town coincided in 1976 with the establishment of a MRC Unit for Ischaemic Heart Disease, focusing on identification of genetic abnormalities.¹⁹⁴ This was later to become the MRC/UCT Cape Heart Centre, the largest heart research group in South Africa.¹⁹⁵ This was part of an international trend towards more clinical investigations at the molecular and genetic level.

GSH developed both medical and surgical research capacity in studies of liver disease as well as heart disease. Genetic abnormalities in small populations who then intermarry over decades can create a situation in which certain genetic diseases become unusually prevalent.¹⁹⁶ Afrikaners (and a small group of Africans in the Eastern Cape) showed unusually high levels of the disease porphyria.¹⁹⁷ Recognition of the problem in the Afrikaner population attracted government attention and research funding in the 1950s, a time when it was also receiving some international attention. In 1957, the CSIR funded a Porphyria Research Group at UCT under Lennox Eales. This group pioneered internationally and locally useful new techniques in porphyria diagnosis and classification in the 1960s and 1970s.¹⁹⁸ After Eales' retirement in 1983 the Porphyria Research Group was incorporated into the MRC Liver Research Centre and, under Peter Meissner, concentrated on identifying the genetic defect underlying South African variegate porphyria.

Alongside the metabolic research on liver function in the Division of Medicine¹⁹⁹ the Division of Surgery investigated liver transplantation and regeneration. Terblanche, who had started working on livers while he was a lecturer in surgery at Bristol University, returned to GSH in 1967 and joined the GSH Liver Clinic. He and Saunders persuaded the MRC of the importance of liver transplantation and founded the Liver Research Unit in 1973.²⁰⁰ Of this time Terblanche says, 'There was money. It was a dynamic time. The Unit attracted bright people. We had great facilities. The climate was right.'²⁰¹ The first human liver transplant had been done in Denver in 1964, but liver transplants were not as successful as heart transplants.²⁰² Most of the GSH surgical research in the 1960s and 1970s focused on understanding regeneration²⁰³ and detoxification in livers.²⁰⁴ The GSH team conducted randomised controlled trials on different liver therapies during the 1970s on one of the largest series of patients worldwide who had been successfully treated with sclerotherapy in reducing variceal bleeding as a result of liver cirrhosis.²⁰⁵ Once immune-

suppressing regimes had improved for humans, a liver transplant programme was started in 1988.²⁰⁶

Constraints and opportunities, 1985-2000

Research activity at GSH had been encouraged in the 1960s and 1970s by a sympathetic state bureaucracy eager to prove South Africa's intellectual worth under Apartheid. However, this generosity was soon constrained and redirected by the national economic and political crises of the 1980s. As GSH pathologists had complained in the 1950s, 'The first thing to suffer in an overworked and understaffed department is research'.²⁰⁷ Such problems, exacerbated by inflation and devaluation of the currency, tempted doctors at GSH into private practice and into employment abroad.²⁰⁸

After 1994, public health reforms intensified the focus on primary health care which had already begun in the latter days of Apartheid. Attending to the needs of poor communities became research policy in government-funded organizations such as the MRC and CSIR after 1994. The national Ministry of Health became more proactive in developing a centralised research strategy focused on the needs of local communities, research capacity and the burden of disease.²⁰⁹ Although the Department of Science and Technology emphasized scientific competitiveness as well as relevance in research, national and provincial Departments of Health began to focus strongly on service delivery, especially at the primary health care level. Both national and provincial health authorities drew back from subsidising the costs of clinical research²¹⁰ or funding overtime for research and teaching.²¹¹ The Western Cape provincial government (now called PAWC) began to distinguish between their role in providing health services and the 'academic functions' of the universities, i.e. training and research,²¹² which were now considered the sole responsibility of other government departments such as Education.

Although UCT and the GSH Chief Medical Superintendent wanted to maintain UCT's 'symbiotic relationship' with GSH, PAWC wanted greater separation between the administration of the hospital and the university,²¹³ and tensions began to rise. UCT and its joint staff predicted that provincial funding cuts would affect teaching and research more than service delivery,²¹⁴ and resolved to prioritise research.²¹⁵ The university now had to raise research money from alternative sources²¹⁶ and created a post in the Faculty for research administration and planning in 1993.²¹⁷ But neither UCT nor GSH had been very actively involved in setting research agendas or in measuring the quality or direction of its research activity. It was therefore difficult for UCT, reluctant to enforce research agendas and unused to measuring research outputs, to step into the breach and recreate the supportive research environment experienced in the hospital in the 1970s. UCT Medical School's current research policy remains a general guideline affirming the need for 'blue sky' research and pursuing individual research agendas, although it does encourage researchers to be cognisant both of the burden of disease nationally, and of national and international research priorities set by the MRC and the WHO.²¹⁸

The 1990s brought serious and intensifying cutbacks at tertiary hospitals. GSH had experienced expansion in the 1970s: a 28% increase in professional staff between 1974 and 1984, although this had been coupled with an even greater increase in inpatients (62%) and outpatients (40%).²¹⁹ In the 1980s, joint staff at GSH had already begun to

complain of reduced time for research and questioned the 'commitment to research implicit in university posts'.²²⁰ Between 1990 and 2003 the Department of Medicine at GSH lost 35% of its full-time faculty staff and 72% of the beds in internal medicine alone.²²¹ Part-time staff, who had done some of the clinical work and thus provided relief for full-time researchers, were reduced too.²²² The Division of Obstetrics and Gynaecology at GSH lost half of its permanent staff between 1990 and 1998 because posts were frozen.²²³

Changes in tax law had already resulted in reduced funding for attendance at conferences nationally and overseas in the 1980s.²²⁴ Stricter rules for PAWC support of overseas trips had already been introduced in the 1980s.²²⁵ Fees for patients who were a part of a clinical study, for example, were no longer covered by the hospital after 1992.²²⁶ Although research publications contributed to an individual's professional standing, and brought financial benefits for the medical faculty in general, research seems to have become a relatively low priority for appointments or career advancement in the government health system during the restructuring of the 1990s. Record-keeping sponsored by the provincial authorities was now directed more towards tracking service provision than providing research data.²²⁷ The practice of typing and microfilming patient summaries was abolished, which made clinical research much more difficult.²²⁸

Freezing of posts resulted in rapid reduction of staff because doctors were so mobile, attracted both into the private sector and into wealthier institutions abroad.²²⁹ Staff had more clinical responsibilities because of the staff cuts, and more teaching responsibilities because of the introduction of a more intensive problem-oriented teaching program at the medical school. With increased pressure on salaries, staff suffered a reduction in real income.²³⁰ There was a growing financial incentive to take on private work, or move into private practice. GSH had already experienced considerable loss of trained staff to the private sector especially after its expansion in the 1970s.²³¹ The introduction of limited private practice for joint staff in 1993, later called 'remunerative work outside the public service' (RWOPS), reduced the time available to do research work.²³²

Good researchers are often attracted away from institutions like GSH to better-resourced specialist centres of excellence abroad but until the late 1980s, skilled immigration more or less balanced the 'brain drain' in South Africa.²³³ Many medical staff at GSH in the 1940s and 1950s were European immigrants. Barnard and others who were tempted by offers from abroad could sometimes be retained with special merit award payments.²³⁴ The 1960s to 1980s were marked by periods of political tension which encouraged emigration - after Sharpeville in 1960, the Soweto uprising of 1976, and the States of Emergency in 1986-7.²³⁵ 'Bill' Hoffenberg, an endocrinologist at GSH regarded as an 'international authority' for his work on albumin metabolism,²³⁶ was banned by the Nationalist Government because of his political beliefs and activities, and left GSH for an illustrious career in Britain in 1968.²³⁷ Some black doctors also emigrated for political reasons or because they found it difficult to practice as specialists in Cape Town.²³⁸

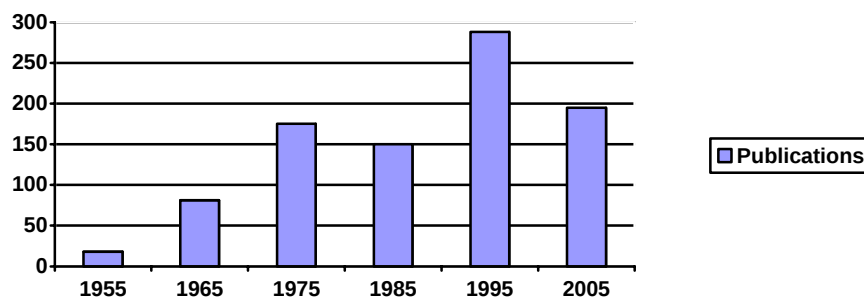
The academic brain drain affected GSH much more intensely in the post-1985 period, with the net outflow of skilled people from the country peaking in 2000.²³⁹ Basil Bonner remembered a mass exodus of GSH consultants in the early 1990s to private practice and

jobs abroad.²⁴⁰ UCT Medical School and Wits graduates predominated among South African medical graduates practising in the United States and Canada in 2002.²⁴¹ On the one hand, the loss of key people at the height of their career created opportunities for others to step into their shoes. Five or six key endocrinologists left GSH in the early 1980s, for example, capacity which was regrown from specialists at Red Cross.²⁴² And yet it took time to replace experienced people, and, overall, the loss of good researchers had a negative impact on research output and mentorship of new researchers.²⁴³

The emigration of mid-career professionals and the dearth of young scientific researchers entering the system²⁴⁴ led to the ageing of the research community in South Africa as a whole. About half of the health-related publications in 2004 were authored by researchers approaching retirement or already in retirement, compared to a quarter in 1994.²⁴⁵ Young researchers found it difficult to stay at GSH and pursue their research at the same time in the 1990s.²⁴⁶ Coupled with increased pressure on doctors' research time and greater emphasis on service delivery, research output from GSH thus decreased although quality seems to have been maintained. This pattern characterised scientific research more broadly in South Africa during this period, and the country lost some comparative advantage against other developing countries.²⁴⁷

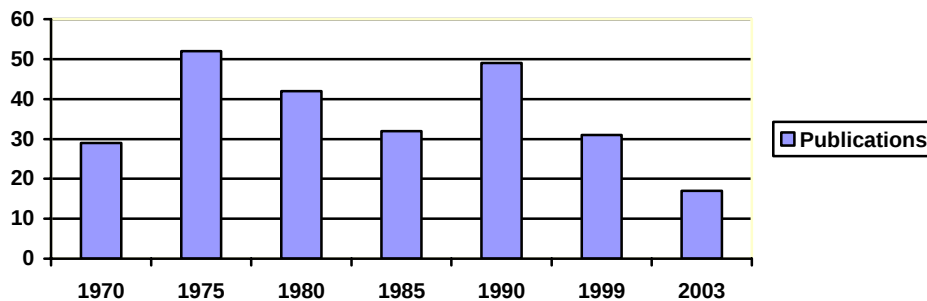
In the Department of Medicine, this decline has been most evident between 1995 and 2005, although research output has yet to drop below 1985 levels (see Figure 2).

Figure 2: Publications from the Department of Medicine, 1955-2005, as contained in the annual reprint collections of the Department.



Numbers of research publications at GSH in general surgery show a slow decline from 1975 to 2003, although the decline seems steepest between 1990 and 2003.

Figure 3: UCT Department of Surgery - number of publications in general surgery as reported in the Annual GSH reports, 1970-2003.



GSH retained the ability to attract and keep good researchers within South Africa. Academics working at GSH, who hold joint appointments with UCT, comprise about a fifth of the twenty-five most published South African researchers in clinical or pre-clinical medicine in the period 1990 to 2004.²⁴⁸ UCT and Wits dominate that list, with 53% (n=15) of the top researchers between them. GSH and UCT were among the top three institutions in a database of top-cited scientific papers published between 1981 and 1994.²⁴⁹ In the 1990s and early 2000s, GSH and UCT publication performance performed strongly on quality and quantity nationally in general and internal medicine, surgery, in cardiovascular and respiratory systems; reproductive medicine; gastroenterology, endocrinology, metabolism and nutrition.²⁵⁰

Key strengths remained in cardiology and liver research. Lionel Opie, who remains one of the top-rated scientists in South Africa, focused on laboratory research into cardiac metabolism, using new techniques of molecular biology.²⁵¹ It was recognised in the 1980s that black South Africans have a high prevalence of rheumatic heart disease, which requires heart valve replacement, because of high levels of poverty.²⁵² Research by clinicians like Bongani Mayosi on the genetic and molecular causes of heart disease has thus focused on pericardial tuberculosis and prevention of rheumatic fever. The research laboratory in the Department of Cardiothoracic Surgery concentrated on developing better heart valves for replacement surgery.²⁵³

Liver research also remained a key strength of the institution. The research done on liver disease was recognised by the MRC with the establishment of the MRC/UCT Liver Research Centre status in 1987.²⁵⁴ The Centre housed the world's leading Porphyria Information Centre.²⁵⁵ Research into fibrinogen and fibrin degradation products and on elevated serum angiotensin-converting enzyme (ACE) also provided insights used in the treatment of unstable angina and pre-eclampsia,²⁵⁶ high blood pressure, stroke and diabetes.²⁵⁷

By the 1990s GSH also developed significant research capacity in fields like anaesthesia and emergency medicine, rheumatology, urology and ophthalmology. The GSH patient intake had long been characterized by a high proportion of trauma patients with gunshot wounds²⁵⁸ and stab wounds in admissions²⁵⁹ because of gang violence and drug or alcohol abuse.²⁶⁰ The prevalence of trauma cases was somewhat reduced with the

introduction of community health centres, but GSH nevertheless offered clinicians an opportunity to gain extensive experience in emergency medicine.²⁶¹ The status of emergency medicine was initially quite low, however, and it was only recently recognised as a specialty.²⁶² The heavy case load restricted opportunities to conduct research. A major research advance in this area has come from a collaboration between the GSH Trauma and Radiology Departments and the De Beers Diamond Mining Organisation to develop a special low-dose radiation x-ray screening apparatus. Named LODOX, it can accurately pinpoint foreign objects such as bullets in trauma patients²⁶³ and monitor organ function for research purposes.

Psychiatric research was boosted with the establishment of the UCT/MRC Clinical Psychiatry Research Unit in 1981, which received funding for a decade. The Psychiatry Department staff produced over 500 journal articles, articles, and chapters in books,²⁶⁴ and ranked second in the country on average citations per paper between 1996 and 2000.²⁶⁵ Research conducted by the Psychiatry Research Unit focused on the effects of alcoholism and drug abuse on mental health; and on schizophrenia, mental illness in the elderly and in children, non-compliance with medication, and patterns of admission to psychiatric hospitals.²⁶⁶ In 1997 the Psychiatry Department became a Collaborating Centre of the World Federation for Mental Health, dealing specifically with mental health research and training and the promotion of psychiatry in Africa.²⁶⁷

Research by GSH staff in Psychiatry, Paediatrics and Obstetrics & Gynaecology, perhaps more than other specialties, was characterised by the use of clinical data gathered from communities, clinics and hospitals other than GSH. In part, this broader perspective was due to the fact that beds for specialties like Psychiatry and Paediatrics were limited within GSH. Psychiatric staff worked closely with other hospitals, especially Valkenberg,²⁶⁸ and with community-based initiatives such as the Empilweni counselling centre for children in Khayelitsha. The Division of Obstetrics and Gynaecology at GSH had such a large community case load, however, that research suffered, at least in the 1970s and 1980s. In the 1970s, the Division was already seeing more clinical cases than Medicine and Surgery, partly from an expansion of the specialty and partly from the new MOUs in Heideveld and Athlone.²⁶⁹ In the 1980s the continued increase in clinical cases, and an influx of patients from the Eastern Cape, coupled with staff shortages, hampered teaching and research activities.²⁷⁰

Although many of its patients are HIV-positive, GSH has not been at the forefront of developing clinical AIDS services, apart from the Kidzpositive clinic for HIV-positive children. In 2000, major research initiatives at UCT Medical School were planned on HIV/AIDS, TB, malaria, parasitic infections, major cancers, prevalent genetic disorders, and non-communicable diseases important to Africa.²⁷¹ But although some joint staff are active in AIDS research, there are still very few infectious diseases specialists employed within GSH, and only three infectious diseases beds.²⁷²

Because of the stigma associated with it as a 'gay' disease, or because it is a sexually transmitted infection (STI), HIV and AIDS research was a 'Cinderella discipline' well into the 1990s.²⁷³ The first AIDS clinic in the mid 1980s, research on the natural history of HIV before anti-retroviral drugs, and many clinical trials in the 1990s were all

managed out of Somerset Hospital rather than GSH. The first AIDS clinic was at Somerset Hospital in the mid-1980s - one was only established at GSH in 1992.²⁷⁴ There was in fact some resistance within GSH to the establishment of an AIDS clinic there.²⁷⁵ The GSH authorities argued that HIV was a sexually-transmitted infection, and the primary care of such patients did not fall under the responsibilities of a general hospital.²⁷⁶ GSH was established as a general hospital, but from the beginning it was insulated to some extent from the research and treatment of infectious diseases which happened in institutions such as the City Hospital for Infectious Diseases (until the 1980s) and the network of tuberculosis and sexually-transmitted disease clinics.

By the late 1990s, when the hospital (and the country) recognized the likely impact of the AIDS epidemic, an environment of severe budget cuts made it difficult to argue for the expansion of clinical and research capacity in the relatively new area of infectious diseases within GSH.²⁷⁷ The profile of AIDS patients coming into the tertiary system changed significantly within the 1990s as treatments were developed and more cases could be diverted into the primary healthcare system. Most HIV and AIDS research projects conducted by GSH staff require a broader cross-section of patient data and thus use data from primary or secondary centres such as G.F. Jooste hospital.²⁷⁸ For similar reasons, the Institute of Infectious Diseases and Molecular Medicine, established in 2005 at UCT Medical School, conducts most of its research in community settings rather than in GSH itself.²⁷⁹

A similar pattern can be discerned in Public Health. By the 1970s the field of public health had already begun to develop out of a critique of hospital-based medicine as a solution to public health problems in developing countries.²⁸⁰ New priority was given to randomized controlled trials, evidence-based medicine and a broader epidemiological analysis of the burden of disease.²⁸¹ By the 1970s, UCT Medical School began to encourage research on public health issues in a new Department of Community Health.²⁸² Researchers at UCT began to make more contacts in other developing countries,²⁸³ although the impact of this has been patchy and primary relationships with British and American institutions have remained strong. Much of the research conducted by the Department of Community Health or Public Health at UCT Medical School of necessity focused on broad epidemiological studies outside the hospital. More seriously, there has not been very much health systems research on GSH, to understand how patients are managed within the tertiary system or how referral systems between tiers of the health system work.²⁸⁴

This is partly because of a general dearth of epidemiological and health systems research in relation to other kinds of medical research. In the GSH context there was also the consideration of territoriality over data access. There was already an institutional tendency towards personal and departmental control over record keeping. Such records were linked to departmental research, which was important for maintaining professional status. Poorly designed and implemented computer-based record keeping systems from the 1970s onwards did not encourage departments to relinquish control of their records. This problem, common in many hospitals, made it difficult for the GSH authorities to gain effective access to the record keeping process and therefore for other researchers to conduct systematic analysis of hospital-wide data. This limited access to and analysis of

hospital-wide data for health systems research or indeed their inclusion in broader epidemiological studies.²⁸⁵

Conclusion

In the 1940s, clinical research had a low profile at GSH, which focused on clinical care, and at UCT Medical School, which focused on training general practitioners. At this time, however, research was also relatively cheap: low-tech equipment could be made locally, even by the scientists and technicians themselves.²⁸⁶ This enabled GSH researchers to ‘punch above their weight’, making breakthroughs in areas such as digital plethysmography and pre-diabetes.

The clinical research conducted at GSH in the well-funded decades of the 1950s to 1980s allowed the institution to situate itself as a competitor within the broader social and scientific transformation of medicine in the western world.²⁸⁷ GSH was able to ride the wave of increasing quantification, collaboration and specialization that characterized scientific investigation internationally after World War II. Its research became more dependent on specialised laboratory work, complex equipment and computerized analysis and shifted towards genetic and molecular investigations of disease by the late 1980s, again reflecting international trends.²⁸⁸ Local conditions at GSH allowed productive relationships to develop between full- and part-time staff, between clinical and laboratory work, and between an emerging range of specialists within the hospital. Research outputs at GSH thus increased dramatically from the late 1950s into the 1990s.

Building on the work of people like Brock, Schrire and Goetz in the 1950s, GSH developed significant capacity in certain fields of clinical research, initially most notably in malnutrition and neonatal care, and later in heart and liver disease. By the 1960s, increasing attention was paid to research on chronic problems like cancer, pulmonary and cardiovascular disease, which were becoming the leading cause of death in the US and Europe, as well as among the white electorate in South Africa. While doing more public health work in communities from the 1970s, GSH could not fully capitalise on the trend towards primary health care and public health research. The hospital tried to maintain its significant research strengths in areas of curative hospital-based medicine, and saw more of these patients as it became a tertiary hospital.

National and provincial government had provided most of the necessary infrastructural investments for clinical research at GSH from the early 1950s to the 1980s. Unfortunately, however, this investment was based on government privileging of tertiary institutions in a time of relative financial strength. By the late 1990s, research remained a status symbol for government, but attracted significantly less health department investment as the focus shifted to health care delivery in the hospital. There was a reduction in the quantity of scientific research output in South Africa as a whole and at GSH, when a decade of budget and staff cuts had whittled away research time for clinicians, and reduced the number of clinicians doing research at the hospital. The research output of staff working in the hospital is likely to decline further as few younger clinicians are now able to devote serious time to their research. UCT Medical School began to attract more research funding from national government’s National Research Foundation, the MRC and international funders after 2000,²⁸⁹ but much of this funding

went into research institutes at the Medical School which conducted community-based studies.

In the financial and political turmoil of the 1980s, GSH staff showed growing pessimism about narrowing the 'research gap' with well-resourced western research centres in an increasingly expensive and competitive international research environment dependent on high-tech equipment and teams of good researchers.²⁹⁰ Financial constraints limited the institutions ability to develop new areas of research. Although GSH began to see high levels of trauma cases from the 1970s and HIV/AIDS cases from the 1990s, significant research emphasis in these areas was relatively slow to develop. Health systems and public health research was also not fully integrated into the GSH research agenda, partly because the hospital was much more focused on tertiary health care delivery in the 1990s. More health systems research could however show what GSH contributes and how it can best interact with other levels of the public health system.

Within this context there are opportunities for researchers to build on current strengths, revisit their research agendas and develop new methodologies to address local problems.²⁹¹ More generally, there needs to be more debate about the role of clinical research in health care as well as teaching, what competitiveness means (i.e. how best to judge the quality and relevance of research, nationally and internationally), what transformation is needed in the research sector, and how to effect it in a time of skills shortage.

¹ The Cohen Report 1953 cited in L.A. Reynolds and E.M. Tansey, 'Clinical research in Britain, 1950-1980', Wellcome Institute for the History of Medicine, London, 9 June 1998, Wellcome Witness Seminars, Volume 7 – September 2000, p.7.

² J.H. Louw, 'Research in the University of Cape Town Medical School 1912-1962', *SAMJ* (19 January 1963), 53-56; R.H. Goetz, 'Early Surgical Research at the University of Cape Town: the beginning of the J.S. Marais Research Laboratory, 1937-1957', *South African Journal of Surgery* 26(4) (1988), 140-147; J.H. Louw, 'Surgical research at the University of Cape Town', *South African Journal of Surgery* 26(4) (1988), pp.137-140; R. Hickman, 'Surgical research at the University of Cape Town from 1967', *South African Journal of Surgery* 26(4) (1988), 148-152; J.F. Brock, 'Clinical Research', *SAMJ* 13(8), 22 April 1939, 291-294; J.F. Brock, 'Some Highlights of Medical Research in South Africa' in A.C. Brown (ed.) *A history of Scientific Endeavour in South Africa* (Cape Town: Royal Society of South Africa (Rustica Press, 1977), pp.192-213.

³ GSH and related institutions like Red Cross Hospital provided UCT Medical School staff with clinical material for research, and all GSH clinicians would have held joint appointments with UCT after 1951. It is thus difficult to disaggregate the contributions of the two institutions.

⁴ R.E. Kirsch, 'Academic medicine - what will we leave the next generation?', *SAMJ* 72, 18 July 1987, 145-148.

⁵ S. Dubow, *A Commonwealth of knowledge: Science, sensibility and white South Africa 1820-2000* (Oxford: Double Storey, 2006), p.278.

⁶ S. Dubow, *A Commonwealth of knowledge*, chapter 5.

⁷ Basil Schonland cited in D. Walwyn, 'Serving the needs of society with revolutionary bioscience research' (Pretoria: CSIR, 2005), p.4.

⁸ J. Mouton, N. Boshoff and T. Bailey, 'Promoting South African Science and Technology capacities for the 21st century: from policy to reality' Background document, Academy of Science of South Africa (ASSAf) consultative forum, 13-14 September 2002, pp.44-45. Accessed at <http://blues.sabinet.co.za/images/ejour/assaf/background.doc>.

- ⁹ M. Mangena et al., Department of Science and Technology Corporate Strategy 2004/5 to 2006/7, Department of Science and Technology, 2004. Accessed at http://www.dst.gov.za/publications-policies/strategies-reports/reports/corp_strategy.pdf.
- ¹⁰ S. Dubow, *A Commonwealth of knowledge*, p.275; N. Nattrass, *Mortal Combat: AIDS Denialism and the Struggle for Antiretrovirals in South Africa* (University of KwaZulu-Natal Press, 2006).
- ¹¹ S. Dubow, *Scientific racism in modern South Africa* (Cambridge: Cambridge University Press, 1995), pp.47,50.
- ¹² S. Dubow, *Scientific racism*, p.196.
- ¹³ S. Dubow, *Scientific Racism*, p.288.
- ¹⁴ C. Logan, *Celebrity surgeon: Chris Barnard, a life* (Cape Town: Jonathan Ball, 2003), p.103.
- ¹⁵ S. Dubow, *A Commonwealth of knowledge*, pp.253-54.
- ¹⁶ N. Stepan, *The idea of race in science, Great Britain 1800-1960* (London: Macmillan, 1982), p.172.
- ¹⁷ J.F. Brock, 'Some Highlights of Medical Research in South Africa', p.211; M. Malan *The Quest of Health*, p.408; J.F. Louw, *In the shadow of Table Mountain*, p.400. C.J. Uys, 'National disease patterns in South Africa', *SAMJ* 40(8), 19 Feb 1966, 159-165, p.159. S. Cywes, and H. Krige, 'Intravenous cholangiography and tomography as an aid in the diagnosis of ascariasis of the biliary tract', *SAMJ* 34(23), 4 June 1960, 478-479.
- ¹⁸ C.J. Uys, 'National disease patterns in South Africa', pp.160, 161.
- ¹⁹ G.T.H. Ellison and T. de Wet, 'The use of 'racial' categories in contemporary South African health research', *SAMJ* 87(12) 1997, 1671-1679.
- ²⁰ G.T.H. Ellison and T. de Wet, 'The use of 'racial' categories'; W.W. Dressler, K.S. Oths, and C.C. Gravlee, 'Race and ethnicity in public health research: Models to explain health disparities' *Annual Review of Anthropology* 34, 2005, 231-252, p.234.
- ²¹ W.W. Dressler et al. 'Race and ethnicity in public health research', p.245.
- ²² W. Pick, 'Nomenclature in a pigmentocracy', *Letters, SAMJ* 76, 2 Dec 1989, p.633.
- ²³ S. Marks and N. Andersson, 'Issues in the political economy of health in Southern Africa', *JSAS*, 13(2) (1987), 177-86.
- ²⁴ S. Marks, 'Public Health Then and Now: South Africa's Early Experiment in Social Medicine: Its Pioneers and Politics', *American Journal of Public Health*, March 1997, Vol. 87, No. 3, 452-459, p.453.
- ²⁵ J.F. Brock with M. Rollo, 'The case of the Coloured people: Their pattern of health and Disease', *SAMJ* 23 (50), December 10 1949, 1000-1010, p.1008.
- ²⁶ *Cape Times* 24 January 1978.
- ²⁷ See chapter 5.
- ²⁸ Y. Nordkvelle, 'The academic boycott of South Africa debate: Science and social practice', *Studies in Higher Education* 15(3), 1990, 253-275, p.253.
- ²⁹ H.M. Coovadia, 'Sanctions and the struggle for health in South Africa', *American Journal of Public Health*, 89(10), October 1999, 1505-1508, p.1507.
- ³⁰ HA, UCT Medical school departmental files, Dept. of Psychiatry: F. Caldicott, R. Williams and P. Rice, 'Report on the College's Preliminary Visit to South Africa', Royal College of Psychiatrists, Oct 1990.
- ³¹ H.M. Coovadia, 'Sanctions and the struggle for health in South Africa', p.1506.
- ³² UCTAA, Box 3, Stack No 49 Bay 3 (Part 1), BOFM Minutes 6.1.1977 – 5.12.1977, Faculty of Medicine Dean's Circular No 85, 15 April 1977, Leave Reports.
- ³³ UCTAA, Box 3, Stack No 49 Bay 3 (Part 1), BOFM Minutes 6.1.1977 – 5.12.1977, Meetings 19.7.1977 and 27.9.1977.
- ³⁴ UCTAA, Box 3, Stack No 49 Bay 3 (Part 1), BOFM Minutes 6.1.1977 – 5.12.1977, Faculty of Medicine Dean's Circular No 83, 6.1.1977 Report on Special Leave - Associate Professor D McKenzie.
- ³⁵ D. Clery, 'Elite Science in a poor country', *Science*, 267(5215), 2 June 1995, 1282-1286, p.1283.
- ³⁶ See chapter 1.
- ³⁷ HA, Biographical File on Hamilton Naki, UCT Citation, Honorary Degree for Mr Hamilton Naki, 20th June 2003.
- ³⁸ A. Aboo interview with A. Digby and H. Deacon, 4.5.2006; D. Stein interview with H. Phillips, 2.2.2007.
- ³⁹ C. Dharsey interview with A. Digby and H. Deacon, 27.07.2007. A. Aboo interview, 4.5.2006; D. Stein interview, 2.2.2007.

-
- ⁴⁰ HA, Doctors Biographical Files, Dr Golda Selzer, Untitled Memoir, 26 Jan 1981, pp.6-7.
- ⁴¹ R. Hickman, 'Surgical research at the University of Cape Town from 1967', p.151.
- ⁴² J. Mouton, N. Boshoff and T. Bailey, 'Promoting South African Science and Technology capacities' pp.44-45.
- ⁴³ UCT Department of Development and Public Affairs, *The transformation of the University of Cape Town, mid-1980s to mid-1990s: promoting excellence and equity*, UCT 1996, p.7.
- ⁴⁴ National Advisory Council on Innovation (NACI) and The Department of Science and Technology (DST), *Facing the Facts: Women's Participation in Science, Engineering and Technology* (Pretoria: National Advisory Council on Innovation and the Department of Science and Technology, 2004), p.25.
- ⁴⁵ NACI and DST, *Facing the Facts*, pp.21-23.
- ⁴⁶ NACI and DST, *Facing the Facts*, p.41.
- ⁴⁷ S. Benatar, 'Informed consent – a survey of doctors' practices in South Africa', *SAMJ* 85(12), Dec. 1995, pp.1273-1278, p.1277.
- ⁴⁸ *Cape Argus*, 12 Aug 1981.
- ⁴⁹ See also chapter 5.
- ⁵⁰ A. Niewijk, 'Tough Priorities: Organ Triage and the Legacy of Apartheid', *The Hastings Center Report*, Vol. 29, No. 6. (Nov - Dec 1999), 42-50, p.47.
- ⁵¹ P.J. Commerford, 'Cardiology: recent advances and their implications', Inaugural lecture as UCT Helen and Morris Mauerberger Professor of Cardiology, 23 March 1988.
- ⁵² N.P. Steyn, D. Bradshaw, R. Norman, J.D. Joubert, M. Schneider, and K. Steyn, *Dietary Changes and the Health Transition in South Africa: Implications for Health Policy* (Cape Town: South African Medical Research Council, 2006), pp.34-35.
- ⁵³ W. Makgoba and S. Seepe, 'Knowledge and Identity: An African Vision of Higher Education Transformation', in S. Seepe (ed.) *Towards an African Identity of Higher Education* (Pretoria: Vista University & Skotaville Media, 2004), 13–57, pp.27, 44, 46.
- ⁵⁴ R.L. Geiger, 'The dynamics of university research in the United States:1945-90' in T.G. Whiston and R.L. Geiger (eds.) *Research and Higher Education: The United Kingdom and the United States* (Open University Press: Buckingham), 3-17, pp.3-4.
- ⁵⁵ S. Meiring Naude and A.C. Brown, 'The growth of scientific institutions in South Africa' in A.C. Brown (ed.) *A history of Scientific Endeavour in South Africa* (Cape Town: Royal Society of South Africa (Rustica Press), 1977), 60-85, pp.69, 75.
- ⁵⁶ J.H. Louw, 'A brief history of the Medical Faculty, UCT', *SAMJ* 24 (Nov 1979), p.864-70, p.866.
- ⁵⁷ C.F. Saint, 'Some recollections of the early days of the Medical School', in R. Kirsch and C. Knox (eds) *UCT Medical School at 75* (Cape Town: UCT, 1987), 25-30, p.28.
- ⁵⁸ H. Phillips, *The University of Cape Town, 1918-1948: the formative years* (Cape Town: UCT Press, 1993), pp.90, 92, 99.
- ⁵⁹ J.H. Louw, *In the Shadow of Table Mountain*, p.398.
- ⁶⁰ B.K. Murray, *Wits: the 'open' years: a history of the University of the Witwatersrand, Johannesburg 1939-1959* (Johannesburg: Witwatersrand University Press, 1997), pp.188, 191.
- ⁶¹ H. Phillips, *The University of Cape Town, 1918-1948*, pp.86-87.
- ⁶² 'Obituary: Prof. William Tasker Adam Jolly', *SAMJ* 13(15), 12 August 1939, p.578.
- ⁶³ J.H. Louw, *In the Shadow of Table Mountain*, pp.293-4.
- ⁶⁴ 'The William Adam Jolly Fund for Research in Physiology', *SAMJ* 14, 27 July 1940 p.290.
- ⁶⁵ J.H. Louw, *In the Shadow of Table Mountain*, pp.260-262.
- ⁶⁶ R.H. Goetz, 'Early surgical research at the University of Cape Town', *SA Journal of Surgery* 26(4), December 1988, 140-147, p.141.
- ⁶⁷ HA, UCT Medical school departmental files, Cardiology, HR Sanders, 'The Cardiac Clinic - GSH', extracts from notes compiled by Mrs CM Hall, assistant to Prof Schrire from 1951.
- ⁶⁸ Brenner cited in B.K. Murray, *Wits: the 'open' years*, p.193.
- ⁶⁹ J.H. Louw, 'A brief history of the Medical Faculty, UCT', p.866.
- ⁷⁰ J.H. Louw, *In the Shadow of Table Mountain*, pp.399-400.
- ⁷¹ A. Landsborough Thomson, *Half a century of medical research. Volume Two: The programme of the Medical Research Council (UK)* (London: Her Majesty's Stationery Office, 1975), p.5.
- ⁷² M. Malan, *The Quest of Health*, p.299.

-
- ⁷³ J. and R. Simons, *Class and Colour in South Africa*, chapter 21.
- ⁷⁴ J.H. Louw, *In the Shadow of Table Mountain*, p.400.
- ⁷⁵ R. Kirsch, Interview with Harriet Deacon, 3.8.2007.
- ⁷⁶ 'Passing events', *SAMJ* 24 (42) October 21, 1950, p.914.
- ⁷⁷ 'Passing events', *SAMJ* 27(14), 4 April 1953, p.287.
- ⁷⁸ J.D. Hansen, 'John Fleming Brock', *The Journal of Nutrition* 117 1987, 1815-1819, p.1816.
- ⁷⁹ J.D. Hansen, 'John Fleming Brock', p.1817.
- ⁸⁰ J.F. Brock cited in H. Phillips, The University of Cape Town, p.324. see also J.F. Brock, 'Clinical research', *SAMJ* 13(8), April 22, 1939, 291-294, p.291.
- ⁸¹ G. Bull and I. Grayce in R. Kirsch (ed.) *The Forman Years* (Cape Town: UCT, 1984), pp.34, 65.
- ⁸² R. Hoffenberg, in R. Kirsch (ed.) *The Forman Years*, p.105.
- ⁸³ H. Nossel in R. Kirsch (ed.) *The Forman Years*, p.140.
- ⁸⁴ B. Myers and R. Kirsch in R. Kirsch (ed.) *The Forman Years*, pp.193-94.
- ⁸⁵ P. Jackson, 'We came by accident and stayed on purpose' in R. Kirsch and C. Knox (eds) *UCT Medical School at 75* (Cape Town: UCT, 1987), 146-154, p.149.
- ⁸⁶ P. Jackson, 'We came by accident and stayed on purpose' in R. Kirsch and C. Knox (eds) *UCT Medical School at 75* (Cape Town: UCT, 1987), 146-154, p.148.
- ⁸⁷ J.H. Louw, 'Research in the University of Cape Town Medical School'.
- ⁸⁸ S.M. Joubert, C. Naidoo, R.D. Dunn, 'Diabetes Mellitus: old wine in new wine skins', in A.J. Brink (ed.) *South African Medical Research: twenty years of growth* (Owen Burgess, Pinetown, 1988), 157-162, p.163.
- ⁸⁹ *GSH Report* 1965, p.12.
- ⁹⁰ P. Jackson, 'We came by accident and stayed on purpose' in R. Kirsch and C. Knox (eds) *UCT Medical School at 75* (Cape Town: UCT, 1987), 146-154, p.148.
- ⁹¹ J.H. Louw, 'Surgical research at the University of Cape Town', p.137.
- ⁹² R.H. Goetz, 'Clinical Plethysmography' *SAMJ* 22(13), 10 July 1948, 422-435, p.422.
- ⁹³ R.H. Goetz, 'Early Surgical Research at the University of Cape Town', p.144.
- ⁹⁴ R.H. Goetz, 'Early Surgical Research at the University of Cape Town', p.142.
- ⁹⁵ R.H. Goetz, 'Early Surgical Research at the University of Cape Town', pp.144-145.
- ⁹⁶ 'Allan M. Cormack', Nobel Foundation website, autobiographical note. Accessed at http://nobelprize.org/nobel_prizes/medicine/laureates/1979/cormack-autobio.html.
- ⁹⁷ L.A. Reynolds and E.M. Tansey, 'Clinical research in Britain', pp.11, 16.
- ⁹⁸ HA, JSAEC Minutes, 1951-1955, 30 Nov 1953.
- ⁹⁹ See A. McGehee Harvey, *Science at the Bedside: Clinical research in American Medicine, 1905-1945* (Johns Hopkins University Press, Baltimore, 1981), on the American system.
- ¹⁰⁰ C.C. Booth, 'Clinical research' in W.F. Bynum and R. Porter (eds.) *Companion Encyclopedia of the History of Medicine vol 1* (London: Routledge, 1993), 205-229, p.218.
- ¹⁰¹ A. Landsborough Thomson, *Half a century of medical research*, p.23.
- ¹⁰² J.F. Brock, 'The evolution of medical research in South Africa', *SAMJ* 34, 21 May 1960, 420-423.
- ¹⁰³ J.F. Brock, 'Clinical research', p.293.
- ¹⁰⁴ B.K. Murray, *Wits: the 'open' years*, p.180.
- ¹⁰⁵ L.A. Reynolds and E.M. Tansey, 'Clinical research in Britain', p.23.
- ¹⁰⁶ A. McGehee Harvey, *Science at the Bedside*, p.140.
- ¹⁰⁷ HA, KPA Hospitaaldepartement: Verslag van die Komitee van Ondersoek na sekere diens-voorwaardes van Kliniese Personeel op die Gesamentlike Mediese Diensstate en Verwante Sake, 1971, p.81.
- ¹⁰⁸ HA, KPA Hospitaaldepartement: Verslag van die Komitee van Ondersoek na sekere diens-voorwaardes van Kliniese Personeel op die Gesamentlike Mediese Diensstate en Verwante Sake, 1971, pp.1-4.
- ¹⁰⁹ B.K. Murray, *Wits: the 'open' years*, p.181, 185.
- ¹¹⁰ J.F. Brock, 'Some highlights', p.206.
- ¹¹¹ M. Malan, *The Quest of Health*, p.460 speaks of the close relationship with Wits but hardly mentions UCT in the book.
- ¹¹² M. Malan, *The Quest of Health*, p.479-80.
- ¹¹³ J.H. Louw, *In the Shadow of Table Mountain*, p.290.
- ¹¹⁴ O.W. Prozsky, 'Combating viral diseases' in A.J. Brink (ed.) *South African Medical Research: Twenty years of growth* (Owen Burgess Publishers, Pinetown 1988), 47-57, p.49.

-
- ¹¹⁵ UCTAA, BOFM Minutes, 1.6.1950 -30.5.1955, Stack 63 Shelf 44 (Part 2), Proposed reply to the letter from the Secretary, Commission of Enquiry into Medical Research, 28 September 1954.
- ¹¹⁶ S. Meiring Naude and A.C. Brown, 'The growth of scientific institutions in South Africa', pp.75, 85.
- ¹¹⁷ L.A. Reynolds and E.M. Tansey, 'Clinical research in Britain', pp.5-6.
- ¹¹⁸ O.W. Prozesky, 'Combating viral diseases', p.54.
- ¹¹⁹ J.F. Brock, 'Some Highlights of Medical Research in South Africa', p.197; O.W. Prozesky, 'Combating viral diseases', p.54.
- ¹²⁰ HA, Doctors Biographical Files, Dr Golda Selzer: Untitled Memoir tss dictated and edited by Dr G Selzer on 26 Jan 1981 at the request of JC de Villiers, pp.6-7.
- ¹²¹ J.H. Louw, *In the Shadow of Table Mountain*, p.290.
- ¹²² UCTAA, BOFM Minutes, Stack 63 Shelf 44 (Part 2), Commission of Enquiry into Medical Research, 28 Sept 1954.
- ¹²³ UCTAA, BOFM Minutes, Stack 63 Shelf 44 (Part 2), Commission of Enquiry into Medical Research, 28 Sept 1954.
- ¹²⁴ HA, JSAEC Minutes, 1955-1959, 27 Feb 1956, Central teaching hospital - final memo sent to the DHS for the CPA, 7.3.1956.
- ¹²⁵ HA, JSAEC Minutes, 1955-1959, 27 Feb 1956, Central teaching hospital - final memo sent to the DHS for the CPA, 7.3.1956.
- ¹²⁶ HB 128/2, THB minutes 1958-61, THB 17 12 58, 'Research' (see also 11.1.61).
- ¹²⁷ *Cape Argus*, 19 June 1958.
- ¹²⁸ HB 128/2, THB minutes 1959-1964 (Part II), 11.1.1961.
- ¹²⁹ GSH Report 1960, pp.7-8.
- ¹³⁰ HA, Minutes, GSH Advisory Committee to the Medical Superintendent later Joint Medical Staff Advisory and Executive Committee (JSAEC), 1951-1955, 30.6.1952.
- ¹³¹ HA, JSAEC Minutes, 1960-1967, 4.6.1962.
- ¹³² Cape Provincial Council minutes, vol. LXIV (1968), page 8.
- ¹³³ See also chapter 6.
- ¹³⁴ 'Hospital Records', *SAMJ* 25(39), 29 September 1951, pp.705-706.
- ¹³⁵ P. Helman, 'Breast cancer: aspects of local recurrence', *SAMJ* 10, 11 March 1961, p.197-202.
- ¹³⁶ HA, GSH departmental files, Radiotherapy, M. Bennett to The Registrar, UCT, 25 Sept 1967.
- ¹³⁷ GSH Report 1972, p.17.
- ¹³⁸ W. Piller, *The cardiac clinic*, p 12.
- ¹³⁹ HA, File: Special Reports and Surveys, S.A. Fisher, Dept Community Medicine (registrar), 'A survey of problems associated with x-ray retrieval at GSH', June 1982.
- ¹⁴⁰ N. Weeder interview with Harriet Deacon, 12.2.2007.
- ¹⁴¹ J.H. Louw, *In the Shadow of Table Mountain*, p.319.
- ¹⁴² *Cathartic*, vol.viii, spasm 1, April 1959, p.8.
- ¹⁴³ For example, between the UCT medical school endocrine lab and the endocrine clinic - GSH Report 1965, p.12.
- ¹⁴⁴ E.D. Pienaar, J. Volmink, M. Zwarenstein, G.H. Swingler, 'Randomised trials in the South African Medical Journal, 1948-1997', *SAMJ* 92(11), Nov 2002, pp.901-903, p.903.
- ¹⁴⁵ P. Selvais, M. Hermans, 'The one fixed point in a changing age. An analysis of half-secular trends among original papers published in The Lancet 1945-95', *Acta Clinica Belgica* 59(2), 79-83, 2004.
- ¹⁴⁶ GSH Report 1965, p.37.
- ¹⁴⁷ HA, H.R. Sanders papers, Medical informatics: Otto Reinhoff, Report on a Strategy for the Installation of a second generation Cape Hospital information system, 15.3.1984.
- ¹⁴⁸ J.H. Louw, *In the Shadow of Table Mountain*, pp.460-61.
- ¹⁴⁹ HA, JSAEC Minutes, 1960-1967, 22.2.1965: Ophthalmology.
- ¹⁵⁰ GSH Report 1960, p 24.
- ¹⁵¹ HA, UCT Medical school departmental files, UCT Dept of Child Health and Paediatrics Folder, FJ Ford, 'UCT Paediatrics 1953-1969', Tss 1971, and FJ Ford, 'The Department of Child Health' - draft report to the Dean, Dec 1953.
- ¹⁵² HA, UCT Medical school departmental files, UCT Dept of Child Health and Paediatrics Folder, FJ Ford, 'UCT Paediatrics 1953-1969', Tss 1971.

-
- ¹⁵³ HA, UCT Medical school departmental files, UCT Dept of Child Health and Paediatrics Folder, 'Factors which affected the development of paediatrics in the last 50 years in the Asia-Pacific Region, Far East and South America' in WH Boon and M Gracey, 'Fifty years of Paediatrics 1942-1992', *Annales Nestle* 50, 1992, 37-46.
- ¹⁵⁴ HA, UCT Medical school departmental files, UCT Dept of Child Health and Paediatrics Folder, D. Woods, 'The evolution of neonatal services in the Cape Peninsula: future priorities', talk at Dennis Davey's valedictory meeting, Nov 1990.
- ¹⁵⁵ GSH Report 1969, Division of Pathology, p 65.
- ¹⁵⁶ HA, JSAEC Minutes, 1960-1967, 26.10.1964: Letter from Kipps in Bacteriology.
- ¹⁵⁷ J.H. Louw, *In the Shadow of Table Mountain*, pp.289, 392-393.
- ¹⁵⁸ UCTAA, Box 4, BOFM Minutes 9.2.1981 – 30.11.1981, meeting 21.7.1981, Report of P. Jacobs visit to Washington D.C, May 1981.
- ¹⁵⁹ HA, UCT Medical school departmental files, UCT Dept of Child Health and Paediatrics Folder, 'Extracts from the staff newsletters of UCT with comments by Prof H de V Heese', UCT staff newsletter June 1963.
- ¹⁶⁰ HA, UCT Medical school departmental files, UCT Dept of Child Health and Paediatrics Folder, Extracts from the staff newsletters of UCT with comments by Prof H de V Heese", UCT staff newsletter Dec 1960.
- ¹⁶¹ O. Amsterdamska and A. Hiddinga 'The Analysed body' in Roger Cooter and John Pickstone *Medicine in the Twentieth Century* (Amsterdam: Harwood Academic Publishers, 2000), pp.417-433.
- ¹⁶² P. Jackson, 'We came by accident', p.149.
- ¹⁶³ GSH Report 1973, p 84.
- ¹⁶⁴ C.E. Lewer Allen, 'The University of Cape Town artificial limb', *SAMJ* 34(7), 13 February 1960, 125-133.
- ¹⁶⁵ GSH Report 1968 (30th Anniversary Issue), GSHA, p.38.
- ¹⁶⁶ A. McGehee Harvey, *Science at the Bedside*, p.151.
- ¹⁶⁷ J.T. Terblanche interview with H. Phillips, 23.8.2006.
- ¹⁶⁸ H. Phillips, *The University of Cape Town, 1918-1948*, pp.97-98.
- ¹⁶⁹ S. Obrecht, pers. comm. Jan 2008.
- ¹⁷⁰ *Cape Argus*, 24.7.2003.
- ¹⁷¹ Comment by Louw, Professor of Surgery, Program for the visit of Dr S. Meiring Naude to the UCT Medical School, 28 Feb 1972.
- ¹⁷² J.H. Louw, 'Surgical research at the University of Cape Town'.
- ¹⁷³ C. Vaughan interview with H. Deacon, 13.6.2007.
- ¹⁷⁴ O. Amsterdamska & A. Hiddinga, 'The Analysed body'.
- ¹⁷⁵ J.H. Louw, 'Surgical research at the University of Cape Town', p.138.
- ¹⁷⁶ GSH Report, 1975.
- ¹⁷⁷ UCTAA, Box 2, Stack No 49 Bay 3 (Part 1), BOFM Minutes 15.1.1975 – 2.12.1975, 16.6.1975, Dr B.M. Cohen - Degrees of Doctor of Medicine.
- ¹⁷⁸ C. Logan, *Celebrity surgeon*, p.113.
- ¹⁷⁹ J.H. Louw, 'Surgical research at the University of Cape Town', p.138.
- ¹⁸⁰ R.H. Goetz, 'Early Surgical Research at the University of Cape Town', p.145.
- ¹⁸¹ J.F. Brock, 'Some highlights of medical research', p.207.
- ¹⁸² W. Piller, *The cardiac clinic: Groote Schuur Hospital 1951-1972. The Schrire years* (Cape Town: Groote Schuur Hospital Cardiac Clinic, 2000), p. 62.
- ¹⁸³ R. Hickman, 'Surgical research at the University of Cape Town from 1967', p.148.
- ¹⁸⁴ *Cape Argus*, 12.5.1970.
- ¹⁸⁵ C. Logan, *Celebrity surgeon*, p.146.
- ¹⁸⁶ C. Logan, *Celebrity surgeon*, pp. 234-242.
- ¹⁸⁷ R. Hickman, 'Surgical research at the University of Cape Town from 1967', pp.148-152; UCTAA, Box 2, Stack No 49 Bay 3 (Part 1), BOFM Minutes 15.1.1975 – 2.12.1975, meeting 30.9.1975, Projects for UCT Foundation fundraising.
- ¹⁸⁸ HA, UCT Medical school departmental files, Surgical Research: Louw to Read, UCT, 23 August 1971.
- ¹⁸⁹ Department of Medicine reprint collection, office of the Professor of Medicine.

- ¹⁹⁰ P.J. Commerford, 'Cardiology: recent advances and their implications', Inaugural lecture as Helen and Morris Mauerberger Professor of Cardiology, 23 March 1988.
- ¹⁹¹ 'Correspondence: The prevention of Kwashiorkor', *SAMJ* 36(11), 17 March 1962, pp.215-216.
- ¹⁹² M.C. Berman, 'The clinical investigator: a tribute to the late Professor Bernard Pimstone', *SAMJ* 63, 5 March 1983, 366-370, p.368.
- ¹⁹³ R. Kirsch comments on this paper. B. Bronte-Stewart, A. Keys, and J.F. Brock, 'Serum-cholesterol, diet, and coronary heart-disease. An interracial survey in the Cape Peninsula', *Lancet*, 269(6900) 1955, 1103-1108; 'Ancel Keys, Ph.D.', Morbidity and Mortality Weekly Report, Centers for Disease Control and Prevention, 6 August 1999 / 48(30); 651.
- ¹⁹⁴ W. Gevers, 'Lipids and their link with vascular disease', in A.J. Brink, *South African Medical Research*, 173-181; *GSH Report* 1980, p.16.
- ¹⁹⁵ UCT Research Report, 2006. Accessed at <http://www.research2006.uct.ac.za/nodepage.php?nid=60>.
- ¹⁹⁶ M.C. Botha and P. Beighton, 'Inherited disorders in the Afrikaner population of Southern Africa: Part I. Historical and demographic background, cardiovascular, neurological, metabolic and intestinal conditions', *SAMJ* 64(16), 609-612, p.610.
- ¹⁹⁷ R. Day, 'Porphyria: the South African perspective', in A.J. Brink, *South African Medical Research*, 149-156, p.153.
- ¹⁹⁸ R. Day, 'Porphyria: the South African perspective', pp.150-153.
- ¹⁹⁹ P. Meissner to F.A. Korb, Nomination of Prof Ralph Kirsch for the South African Medal (gold) awarded by the South African Society for the Advancement of Science, 21 April 2004, p.6.
- ²⁰⁰ J.T. Terblanche interview, 23.8.2006.
- ²⁰¹ J.T. Terblanche interview, 23.8.2006.
- ²⁰² R.E. Kirsch et al. 'Liver Research 1968-1988', p.163.
- ²⁰³ R.E. Kirsch et al. 'Liver Research 1968-1988', p.168.
- ²⁰⁴ R.E. Kirsch et al. 'Liver Research 1968-1988', p.165-66.
- ²⁰⁵ R.E. Kirsch et al. 'Liver Research 1968-1988', pp.169-170.
- ²⁰⁶ R.E. Kirsch et al. 'Liver Research 1968-1988', pp.168-169.
- ²⁰⁷ HA, JSAEC Minutes, 1951-1955, 28.2.1955,.
- ²⁰⁸ *GSH Report* 1986, p.36.
- ²⁰⁹ A. Hassim, M. Heywood and J. Berger, *Health and democracy: a guide to human rights, health law and policy in post apartheid South Africa* (Johannesburg: Siber Ink, 2007), p.401.
- ²¹⁰ UCTAA, Box 7, BOFM Minutes, 5.1.1990 – 13.12.1990, meeting 7.11.90, Dean's Circular No. MED08/90, and Comments on the memorandum received from Dr C.F. Slabber, Director-General, Department of National Health and Population development, 20.10.1990.
- ²¹¹ HA, G45 BA Hospital Circulars: 1995 - 1997, 11.1.1995; Overtime Remuneration for Medical Personnel: Hospital Memo, 29.8.1994.
- ²¹² HA, PAWC Final Report: associated Academic Hospitals, proposals for a new organisational structure, management and implementation, discussion document March 1998, p.1.
- ²¹³ HA File, King's Fund Report, Unpublished report: 'Academic Health Centres in the Western Cape: a partial diagnosis and a tentative prescription', p.17.
- ²¹⁴ UCTAA, Box 5, BOFM Minutes 5.3.1985 – 3.12.1985, meeting 5.3.1985, p.2.
- ²¹⁵ UCTAA, Box 7, BOFM Minutes, 5.1.1990 – 13.12.1990, meeting 8.5.1990, Executive Officer's Report.
- ²¹⁶ UCTAA, Box 7, BOFM Minutes, 5.1.1990 – 13.12.1990, meeting 7.11.90 Dean's Circular No. MED08/90 and meeting 8 May 1990, Executive Officer's Report.
- ²¹⁷ UCTAA, Box 8, BOFM Minutes, 19.1.1993- 6.12.1993, meeting 19.1.1993, Dean's Circular No. MED01/93, p.13; *GSH Report* 2000/2001, p.12.
- ²¹⁸ C. Vaughan interview, 13.6.2007.
- ²¹⁹ HA, Hannah Reeve Sanders papers, File: Statistics.
- ²²⁰ UCTAA, Box 4, BOFM Minutes 9.2.1982 – 29.11.1982, meeting 20.2.1982, Report of the Executive Committee: Research Component of Joint Staff Posts.
- ²²¹ S R. Benatar, 'Health care reform and the crisis of HIV/AIDS in South Africa', *New England Journal of Medicine* 351, 2004, 81-92, p.85.
- ²²² S. Benatar, interview with H. Deacon, 15.2. 2007; *Die Burger*, 1.2.2003.
- ²²³ *GSH Report* 1997/1998, p.43.

-
- ²²⁴ UCTAA, Box 5, BOFM Minutes, 5.3.1985 – 3.12.1985, meeting 5.3.1985, p.5.
- ²²⁵ HA, Hospital Circulars: October 1974 - March 1981, 'Notice No. 16', p.120, 28 April 1980.
- ²²⁶ HA, G45 BA Hospital Circulars: 1991 – 1994, 'Revised Hospital Fees Structure', p.6, 27 April 1992.
- ²²⁷ HA, File: Special Reports and Surveys, Rawlinson, report for O&G at GSH, MMH and PMH on Data collection and documentation, 1985.
- ²²⁸ R. Kirsch, comments on this paper, G. Maartens interview with H. Deacon, 8.5.2006.
- ²²⁹ See A. Padarath, C. Chamberlain, D. McCoy, A. Ntuli, M. Rowson, R. Loewenson, 'Health Personnel in Southern Africa: Confronting maldistribution and brain drain' EQUINET Discussion Paper no.3, 2003. Accessed at <http://www.equinet africa.org/bibl/docs/DIS3hres.pdf>
- ²³⁰ M. Breier and A. Wildschut, *Doctors in a Divided Society - The Profession and Education of Medical Practitioners in South Africa* (Cape Town: HSRC Press, 2006), pp.71-72.
- ²³¹ See for example the '[a]pparently insatiable demand for anaesthetists in the private sector': GSH Report 1973, p.67.
- ²³² B. Mayosi interview, 12.2.2007 and S. Benatar interview, 15.2. 2007. UCTAA, Box 8, BOFM Minutes, 19.1.1993- 6.12.1993, Box 8. Minutes of the Board of the Faculty of Medicine ; 19 January 1993 - 6 December 1993, meeting 12.1.1993 'Limited Private Practice in the Cape Town Academic Health Complex'.
- ²³³ J. Mouton, N. Boshoff and T. Bailey, 'Promoting South African Science and Technology capacities', p.22.
- ²³⁴ HA, KPA Hospitaaldepartement: Verslag van die Komitee van Onderzoek na sekere diens-voorwaardes van Kliniese Personeel op die Gesamentlike Mediese Diensstate en Verwante Sake, 1971, pp.7,12.
- ²³⁵ J. Mouton, N. Boshoff and T. Bailey, 'Promoting South African Science and Technology capacities', p.22.
- ²³⁶ HA, JSAEC Minutes, 1960-1967, meeting 23.3.1964.
- ²³⁷ UCTAA, Stack 63, Shelf 44 (Part 1), BOFM Minutes, 1.10.1963 – 3.12.1968, Motion by Professor J.F. Brock, 4.8.1967.
- ²³⁸ C. Dharsey interview, 27.7.2007.
- ²³⁹ J. Mouton, N. Boshoff and T. Bailey, 'Promoting South African Science and Technology capacities', p.22.
- ²⁴⁰ B. Bonner interview with A. Digby, 6.5.2006.
- ²⁴¹ A. Hagopian, M.J. Thompson, M. Fordyce, K.E. Johnson and L.G. Hart, 'The migration of physicians from sub-Saharan Africa to the United States of America: measures of the African brain drain', *Human Resources for Health*, 2004, 2:17.
- ²⁴² S. Benatar interview, 15.2.2007.
- ²⁴³ R. Kirsch interview, 3.8.2007.
- ²⁴⁴ J. Mouton, N. Boshoff and T. Bailey, 'Promoting South African Science and Technology capacities', p.44-45.
- ²⁴⁵ This analysis uses the Knowledgebase dataset on the health sciences, which takes into account a wider range of medical fields than the ISI database used by Pouris, as well as publications in non-ISI journals. N. Boshoff and J. Mouton, 'A profile of researchers and research production in health research in South Africa', Draft report, Centre for Research on Science and Technology, 27 July 2006, p.26.
- ²⁴⁶ B. Mayosi interview, 12.2.2007 and L.-G. Bekker, interview with Harriet Deacon, 16.8.2007.
- ²⁴⁷ A. Pouris, South Africa's research publication record: the last ten years', *South African Journal of Science* 99, September/October 2003, 425-428, p.426.
- ²⁴⁸ The list of the top 50 researchers , determined using an ISI and non-ISI dataset includes at least half who work in non-clinical fields of medicine, and in veterinary science. N. Boshoff and J. Mouton, 'A profile of researchers', p.22.
- ²⁴⁹ D. Clery 1995, p.1282. Institutions were ranked according to the total number of citations to papers with at least one author from that institution, in a database of the 100 most cited South African papers published each year between 1981 and 1994.
- ²⁵⁰ Although they give us an idea of the changing importance of research within GSH, publication and citation rates in accredited journals have their problems as a measure of research quality in developing countries. Developing country journals are underrepresented in the international journal databases such as Medline, and many of them have low 'impact factors'. Measures of quality using the ISI database are

provided in this chapter, but should therefore be treated with caution. J. Mouton et al. 'Tracking public Research and development expenditure: a bibliometric analysis of South African output', Draft report, The Centre for Research on Science and Technology, 16 October 2006, Table B3.3, Table B3.5; UCT Research Office, Unpublished report drawn from Research Office Database, based on ISI data 1996-2000.

²⁵¹ L. Opie, citation for 'The Order of Mapungubwe in Silver', Accessed at http://www.thepresidency.gov.za/orders_list.asp?show=340.

²⁵² P.J. Commerford, 'Cardiology: recent advances and their implications', Inaugural lecture as Helen and Morris Mauerberger Professor of Cardiology, 23 March 1988.

²⁵³ See Lionel H. Opie, Bongani M. Mayosi, 'Cardiovascular Disease in Sub-Saharan Africa' *Circulation* December 6, 2005.

²⁵⁴ R.E. Kirsch et al. 'Liver Research 1968-1988', p.164.

²⁵⁵ P. Meissner to F.A. Korb, Nomination of Prof Ralph Kirsch for the South African Medal (gold) awarded by the South African Society for the Advancement of Science, 21 April 2004, pp.9-11.

²⁵⁶ P. Meissner to F.A. Korb, Nomination of Prof Ralph Kirsch, p.6.

²⁵⁷ P. Meissner to F.A. Korb, Nomination of Prof Ralph Kirsch, pp.7-8.

²⁵⁸ GSH Report 1997/1998, p.37.

²⁵⁹ GSH Report 1981, p.42.

²⁶⁰ GSH Report 1966, p.22

²⁶¹ J. Kaplan, *The dressing station: a surgeon's chronicle of war and medicine* (Grove Press, 2003), p.12.

²⁶² A. Abou interview, 4.5.2006.

²⁶³ GSH Group, Annual Report 1999/2000, p.8.

²⁶⁴ HA, Departmental files, Psychiatry, L. Gillis, Psychiatry overview, p.20

²⁶⁵ UCT Research Office, Unpublished report drawn from Research Office Database, based on ISI data 1996-2000.

²⁶⁶ HA, Departmental files, Psychiatry, L. Gillis, Psychiatry overview, p.19.

²⁶⁷ HA, Departmental files, Psychiatry, L. Gillis, Psychiatry overview, pp.19-20.

²⁶⁸ See also chapter 4.

²⁶⁹ UCTAA, Box 3, Stack No 49 Bay 3 (Part 1), BOFM Minutes 6.1.1977 – 5.12.1977, meeting 18.1.1977, Davey to Bromilow-Downing, 22.10.1976.

²⁷⁰ GSH Report 1986, p.111-112. Division of Obstetrics and Gynaecology.

²⁷¹ GSH Report 2000/2001, GSHA, p.12.

²⁷² L.-G. Bekker interview, 16.8.2007.

²⁷³ L.-G. Bekker interview, 16.8.2007.

²⁷⁴ GSH Report 1992/1993, p.13.

²⁷⁵ D. Knobel interview with H. Deacon, 23.7.2007 and G. Maartens interview, 8.5.2006.

²⁷⁶ D. Knobel interview, 23.7.2007 and G. Maartens interview, 8.5.2006.

²⁷⁷ G. Maartens interview, 8.5.2006.

²⁷⁸ G. Maartens interview, 8.5.2006.

²⁷⁹ L.-G. Bekker interview, 16.8.2007.

²⁸⁰ M. Cueto, 'The origins of primary health care and selective primary health care', *American Journal of Public Health*, November 2004, Vol 94, No. 11.

²⁸¹ S. Timmermans, 'Medicine, scientific', p.326.

²⁸² GSH Report 1975, p.23.

²⁸³ For example, the first visit to Zambia of a South African university: UCTAA, Box 6, BOFM Minutes 18.2.1986 – 28.11.1986, meeting 12.8.1986, Executive Officer's Report.

²⁸⁴ One of the few pieces of work include M.F. Zwarenstein, S.R. Benatar, L.R. Shaw, 'The pattern of care in the medical wards of a teaching hospital', *SAMJ* 77(9), 5 May 1990, 460-3.

²⁸⁵ David Bourne, pers. comm. Jan 2007.

²⁸⁶ G. Bull in R. Kirsch (ed.) *The Forman years*, p.34.

²⁸⁷ S. Timmermans, 'Medicine, scientific', in Sal Restivo (ed.) *Science, Technology and Society: an encyclopaedia* (Oxford University Press, 2005), 323-327, p.324.

²⁸⁸ O. Amsterdamska & A. Hiddinga 'The Analysed body' in Roger Cooter and John Pickstone *Medicine in the Twentieth Century* (Amsterdam: Harwood Academic Publishers, 2000), pp.417-433.

²⁸⁹ C. Vaughan, pers. comm. Apr. 2008.

²⁹⁰ The UCT Anatomy Department complained that it was 'hard to imagine the possibility of our department narrowing the research gap between UCT and the North American Institutions', UCTAA, Box 4, BOFM Minutes 10.1.1980 – 2.12.1980, meeting 10.1.1980, Dean's Circular No. 99.

²⁹¹ M. Zwarenstein interview, 3.7.2007.