Early Days at SAAO

I S Glass

South African Astronomical Observatory

It is a rather sobering thought that I am one of only three present SAAO staff (the others being Cynthia Strydom and Alan Cousins) who were there when it opened in January 1972. Although I had been a Research Fellow at the Royal Greenwich Observatory at Herstmonceux in England for only a year, I had been "ordered" by the director, Sir Richard Woolley, then Astronomer Royal, to proceed to the Royal Observatory, Cape of Good Hope, for a period of three years. This was in reality at my own request, so as to take advantage of the good South African weather for the pursuit of infrared photometry. I had just completed building an infrared photometer and cloudy England was not the right place for this work.

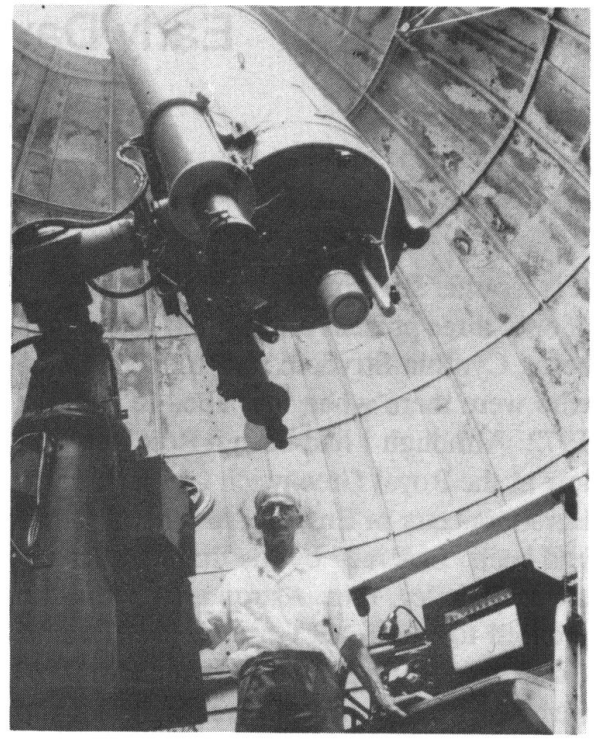
I arrived in Cape Town in October 1971, just three months before the end of the Royal Observatory's existence. Science was at a low ebb, the only other researchers at that time being Alan Cousins and Tim Hawarden. After MIT and Caltech, the rigid procedures and consequent difficulties of developing equipment at the Royal Greenwich Observatory had been quite a shock, but what followed was worse. Most of the activity during the final years of the Royal Observatory had been of a routine nature, consisting mainly of parallax observations with the McClean telescope, positional determinations with the transit circle and some astrometric work with the Astrographic and MRM (Multiple Refractor Mount). Solar plates were taken daily with the ancient photoheliograph and H-alpha exposures were made every few minutes with a Lyot coronagraph. Photography was the main observational technique, together with photoelectric photometry, the latter being the Royal Observatory's most significant area of work, thanks to the unique contribution of Cousins. Plate measuring was a major activity and "lady computers" processed the data with calculating machines, then mechanical. A solitary punch machine was available for entering data on cards, which could be processed on the University of Cape Town's Univac computer. The Observatory time service provided reference data for the Post Office's speaking clock in exchange for free mail and fired the noonday gun, then as now. However, change was in the air: building work was already under way at Sutherland for the new observatory, and preparations for moving the Elizabeth 40-inch (1m) telescope from Cape Town were beginning to occupy the technical staff.

The activities of the Royal Observatory were directed by George Harding, who was "Officer in Charge", since there had been no new appointment of "Her Majesty's Astronomer" (HMA) after Richard Stoy's departure in 1968. Though a very pleasant and considerate person, George was primarily an administrator who valued a smoothly running organization more highly than astronomical output.

The atmosphere was bureaucratic and hierarchical. Many of the remaining Royal Observatory staff members were rather old and were routine observers rather than re-

searchers. There was a fairly large group of expatriates, seconded mainly from the Royal Greenwich Observatory, who welcomed a new face and helped provide an "instant" social life, enjoying parties, braais and picnics. Everybody knew the Science Research Council's "Conditions of Employment Memoranda" better than any other book and there was a sense of enjoyment attached to the exploitation of its labyrinthine regulations for extracting every last penny from the system. Observing time was made up of "duties" of four hours, for which one was paid extra and which counted towards leave. Expatriates could receive "tropical kit allowance" and "overseas allowance"; a house was provided or rent was paid for in lieu thereof. There were constant battles over minutiae with Oscar Fiammingo, the quick-witted treasurer. Morning tea for the "ordinary" staff was provided in the large SW room (now divided up) that had been HMA's living room, but the upper echelon had it separately in HMA's office, nowadays part of the library. Apartheid was, of course, in full force, as much from the laws of the country as from ingrained tradition. There was a large staff of gardeners under Thomson as well as a "tea boy". Joe and Lucas had the job of cleaning the machines and fetching and carrying in the instrument workshop. We had a carpenter (Arthur Rose) and an electrician (Rigby) who were at the time mainly busy with the conversion of the upper part of the West wing into a flat for the expected arrival of Sir Richard as first director of SAAO.

Almost immediately I needed laboratory space and was given the Gill era former workshop near the Liesbeek River (now the Education Centre), while the McClean laboratory was being repainted. I had to have several metal items made and was assigned old Mr Brown to do the machining. Although



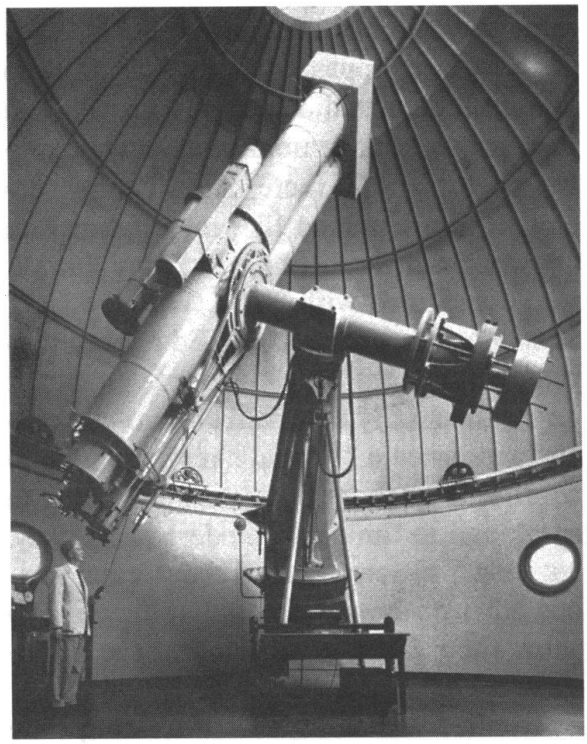
Alan Cousins and the 18-inch Cox-Hargreaves reflector, purchased in 1955.

he enjoyed a tremendous reputation for accurate work, he was on the verge of retirement and I soon found he was in no mood to do anything for anybody. Getting these things made involved spending a lot of time with him, jollying him on and listening to his stories. I could have done the work much faster myself, but it was unthinkable for a scientist to touch the machines in that environment! The mechanical side was controlled by Stimson, an extremely difficult person who antagonized almost everybody, including later on Woolley. After his departure he was always referred to by the technical staff members as "that man" and anybody who mentioned his name was obliged to buy a round of beer.

The first telescope that I used was the 18-inch reflector, which involved displacing Cousins for a week every month or two, almost regarded as lese-majesty! However, he

proved helpful. We duly mounted my infrared photometer and got the telescope into focus on the Devil's Peak beacon, by moving the secondary mirror down about an inch. While observing, a log book of observations had to be kept for later punching onto computer cards and the data came out on a printed strip which had similarly to be punched in afterwards. We fortunately could use the services of an office at the University for this work. It all took time, mistakes meant a re-run and another trip to UCT, and every week's work required many hours to reduce. After my first observing run before Christmas 1971, I got into a productive routine and began to make observations of southern infrared standard stars.

Besides Cousins, the other main astronomer at the Royal Observatory was Joe Churms, who headed the parallax programme. He was an inveterate hoarder of everything. It took three pantechnicons to cart away the accumulated treasures from his house on the Observatory grounds when he eventually moved out. His office was always piled high with papers and he had about 300 books on almost permanent loan from the library at any given time. His official house had a large pipe running from a window to the garage. This was the air pipe for the Wurlitzer organ from the old Alhambra theatre which he had bought at the demolition sale. Although he worked on it sporadically, he never managed to get it going. It was eventually donated by his heirs to the Nico Malan theatre in Cape Town, where it is once again functional. An example of the conservatism in the official attitude occurred when I started a campaign for a card punch that typed the contents along the edge of the cards, enabling editing to be carried out much more easily than with plain cards. I was given many reasons why this was unnecessary -



The McClean telescope, which has a 24-inch photographic objective, an 18-inch visual objective and an 8-inch guiding telescope.

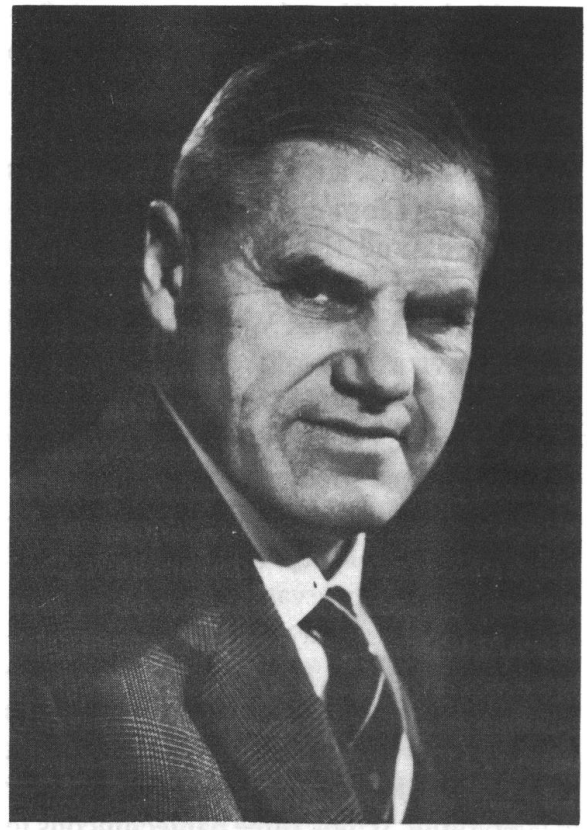
things like "well, you will soon be able to read the hole codes with a little practice" etc, etc. Joe led those who pooh-poohed the idea. The pressure soon built up from other new arrivals who had seen the future and eventually a machine was acquired. Joe himself soon found it so convenient for entering his parallax data that it was only with the greatest difficulty that others could ever get to use it!

My car took a long time to arrive in South Africa and I often went back to my flat in Rondebosch by train at around four o'clock in the morning, following observing. This was not only possible but quite safe in those days.

With the arrival of Sir Richard as director in January 1972 and the beginning of the SAAO regime under the South African CSIR instead of the UK Science Research Council

things began to change quite quickly. Various new faces appeared: Peter Warren, who had just completed a spectroscopic PhD in Cambridge, Jack Penfold, who was also registered for a PhD there, Alan Penny, seconded from England like myself and Ron Olowin from the USA. With Tony Fairall, who constituted with P.A.T. Wild the UCT astronomy department, and Ed Nather, a 1-year visitor from Texas who was an expert on the then fairly new field of mini-computers, we started a "journal club". We tried to confine it to those who were prepared to speak and to limit it to modern astronomy, but soon Sir Richard heard about it and various other of the old timers felt they had to show their faces, thus diluting the atmosphere.

Woolley was not given to wasting time over decisions and, once made, he stuck to them. The preoccupation of the staff with pettifogging administrative matters was not at all to his liking. Instead, he showed that he valued their astronomical output. He had been brought up on the classical problems of galactic structure as a student of Eddington, whom he revered, and cared little for recent developments, such as had arisen from radio and space probes. Quasars, active galaxies and x-ray sources interested him not at all. Space travel he once described as "utter bilge", though he claimed to have been widely misquoted on this topic. Over the years he had come to be regarded as a hopeless reactionary by many. Although he continued with traditional interests at SAAO, in particular starting the programmes of Cepheid observations that still bear fruit, he seemed to have turned over a new leaf and was quite supportive of my infrared work as well as having great hopes for the McMullan electronographic detectors whose development he had sponsored while at the Royal



Sir Richard Woolley, 11th Astronomer Royal.

Greenwich Observatory. He encouraged independence on the part of the brighter young staff members, especially if they had been through Cambridge University! Others were set to work on his own programmes. His manner could be gruff, partly an act which he found convenient from a disciplinary point of view. He also occasionally revealed a humorous and cynical side. He was, for example, a devotee of "Private Eye".

I got to see Sutherland for the first time about April 1972, when the domes were already on the buildings. I travelled up with Sir Richard, Ed Nather and Ron Olowin to inspect the building work. The tarred road to the site was not then complete, so we used the dirt road (now used for access to the boreholes). This has a rather sharp hairpin turn

which Olowin took a little too fast. After Olowin regained control of the car Woolley said rather sharply, "Glass will drive". That bend became known as "Olowin's Leap". To the disgust of the modern-minded such as Nather and myself, the whole new observatory had been planned as if photography was to be the only technique to be used. It was clear that the 20-inch was nearly ready. I offered to go up to align its axes so that we could start observing straight away, but Woolley and George Harding (by then his right-hand man) refused to allow it while the builders were still on site. Only in about June was observing possible, so poor Ed had a frustrating time, having had to wait until nearly the end of his year in South Africa before being able to make observations. He had a remarkable knowledge of the hardware and software of the NOVA minicomputers and I remember watching him enter a programme for scanning double stars directly in binary on the front-panel switches of the computer. I was more fortunate than he since I did most of my more astrophysical observing at Radcliffe Observatory in Pretoria which, under the direction of A.D. Thackeray, was a much more stimulating environment, though backward in technological matters.

Regular observing at Sutherland started for me in November 1972, when the 40-inch was declared ready for use. The technicians who had been working on it headed back to Cape Town the moment they had balanced it with my photometer attached. That night, when I switched it on, it refused to drive. I had no option but to attack the electronics rack myself and fortunately spotted a wire which had come loose from a transformer and was able to solder it and get going. There was no "warm room" and a total of two plugs were provided on the observing floor. I soon persuaded Sir Richard to authorize the construction of a small warm room, which I designed and got Mr Rose to make. Apart from my infrared photometer, the main early instruments were the Yapp spectrograph, on loan from Herstmonceux, and a couple of conventional photometers. The electricity supply at first came from an on-site diesel-powered generator and water was obtained from boreholes. We drove to the domes each night in blue VW beetles. The 30-inch (0.75m) telescope, on an old mount from Cape Town, was added a couple of years later. The present-day hostel and the 74-inch (1.9m) telescope building were erected in 1975, near the end of Sir Richard's 5-year tenure as director. The original hostel having only three bedrooms, we would drive to Sutherland on the morning of our first observing night and the returning astronomers would take the same vehicle back to Cape Town in the afternoon.

The site superintendent for the first couple of years was Hennie Barnard, a pattern-maker by education, and his wife Hettie looked after the hostel, which was then one of the houses built for future on-site technicians. They had the weekends off and would leave casseroles or boboties for us to warm up ourselves. These were not always to the taste of all, so one weekend we raided the refrigerator and found some steaks which we proceeded to braai. This act was treated by the administration as an atrocity and the refrigerators were kept locked up ever after. The Barnards were a sympathetic couple, with a keen interest in the environment, and they collected geological specimens. Hennie was an amateur astronomer and he taught a few boys from Sutherland how to make their own telescopes. The loneliness of their situation eventually became intolerable and they returned to Cape Town. They were succeeded

by Mr and Mrs Roux who had run a school hostel immediately before. Sir Richard was looked upon by them as a headmaster figure by them and the rest of us as schoolchildren. They could be regarded as conservative Afrikaners of the old school. The site foreman, Nicolas Witbooi, and Mr Roux could not get on and the former transferred to the CSIR in Stellenbosch. Frans Hanekom, the present site supervisor, became the next foreman.

Sir Richard had taken the job as Director after retiring from the Royal Greenwich Observatory at 65 and, as he liked to point out, nobody had ever told him he was not Astronomer Royal any more. He had spent much of his early life in South Africa, where his father had been an admiral at Simonstown and had met his mother, of a South African family. He enjoyed being back at the Cape. He was active and in good health, even if his astronomy was old-fashioned. He entered into Cape life again with enthusiasm and bought a summer house at Rooi Els. He took up painting and even began with Afrikaans lessons. This impressed his bosses in the CSIR (Council for Scientific and Industrial Research) very favourably. He was an inspired choice as first director, being very accomplished at getting money out of politicians and having had experience of setting up observatories in Australia and England before SAAO. He told those critics who objected to his working in South Africa that he had worked in Nasser's Egypt, Franco's Spain and Saud's Saudi Arabia and was looking forward to setting up an observatory in hell if the devil gave him a telescope! Occasionally he would invite us younger astronomers for a braai at Rooi Els. His wife was very much a recluse – a sort of Marie Antoinette figure who knew all about who was in love with whom and who had just had a new baby, but was very out of touch with practical matters. She hated car travel and when going to Rooi Els insisted on travelling by train to Somerset West, where Sir Richard had to pick her up.

Alan Cousins retired officially shortly after the SAAO started. He was and still is known very widely for his work on photometric standards. He was the head of the "photometry department" under the Royal Observatory, with Rona Banfield as his assistant. She was the mother figure for all us young bachelors, and presided over afternoon tea each day in the upper east wing. One day Sir Richard called me in and began: "Since you are an expert in infrared, how can I measure stellar fluxes longward of the Paschen limit?" I suggested he should get hold of one of the RCA gallium arsenide photomultipliers which had just become available, and use it with an interference filter. I was told to purchase the necessary equipment, which took as usual several months to arrive. As was then the case with many of his ideas, he had lost interest after about four days and there was no use for the new tube. Alan Cousins then approached me and asked if he could have it, to which I of course said yes. From this stemmed the Cousins VRI system, entirely the product of his retirement years, and which is now in worldwide use.

The official opening of SAAO took place in autumn 1973 and was undertaken by Mrs Thatcher, then minister of science of the UK, and Mr Vorster, prime minister of SA. Most of the SA astronomical community was there. We all travelled up in buses for the occasion. The important guests – politicians of course – arrived by helicopter. While putting up the marquees one of the workmen drove a steel stake into the electricity supply to the (then empty) MRM/30-inch dome, causing the underground cables to melt. An

emergency supply to the other domes was rigged up, but the 30-inch toilet, designated the ladies' for the event, remained in darkness. For the 40-inch inauguration it was intended that Vorster would press a button outside to cause the shutters to open. The original motors were deemed to be too slow, so faster ones were fitted (there had been complaints before from the astronomers about this, but they were not important enough for anything to be done about it). Vorster's security men would not allow him to press a button, so Billy Pearson (electronics technician of long standing) was detailed to open the dome from inside when Vorster turned the key of the front door. A symposium was held at Stellenbosch at which various eminent foreign astronomers, mainly friends of Sir Richard, spoke.

Friday lunchtime usually saw the younger element head for the "Pig and Whistle", a very pleasant beer garden long since built over, at Rondebosch. Sometimes lunch went on so long that it was hardly worth going back to work afterwards. We were very productive in those days nevertheless. One lunchtime we invited an elderly German observatory director to come with us, since it was the last day of his month-long stay. He discovered an affinity for Grünberger Stein, which reminded him of his native Frankenwein and we ended up consuming a good quantity of it. Sir Richard was a little astonished at his "mood" when he went to say goodbye a little afterwards. On another occasion, Alan Penny was being bothered by a small dog which he pushed aside – rather gently in fact – with his foot. The dog let out a tremendous yelp and Alan could not eat again at the Pig without some random person saying: "Kicked any more dogs lately?", or something similar.

When I came, one entered library books to be taken out in a ledger. The numbers borrowed (with the exception of Joe Churms's list, built up over many years), amounted to only a few per month, so low had things fallen. The library was re-organized onto the Universal Decimal Classification system a little later by Helen Kingwill of the CSIR, who worked at SAAO for several years. At one point she decided to throw out antiquated textbooks and enlisted my help in deciding what should go. Sir Richard almost had a fit. "I suppose you have thrown out Drude's Optics" he said, in his rather menacing way. In fact, we had. However, nothing was got rid of in the end, but the older works were moved upstairs. On another occasion I was looking for Ambartsumian's "Astrophysics", which did not appear to be in the collection. I asked Sir Richard if the library could acquire it, but he said no: presumably Ambartsumian was not one of his friends. I waited some time until he was away and asked George Harding to authorize its purchase. Unfortunately he had heard that Sir Richard had refused, so he did also. A few weeks later I found it sitting on the shelf – it had been there all along, uncatalogued!

The early days presented ideal opportunities for those of us who knew what we wanted to do. We had about as much observing time as we could handle, a rare privilege today. The southern hemisphere was relatively unexplored – for example the southern Schmidt surveys were not yet available – and the largest telescopes were the 1.9m instruments of Mt Stromolo in Australia and Pretoria. With new techniques and a new institution, it was easy to find worthwhile projects and to make successful observations. In fact, we were very fortunate to have been founder members of the South African Astronomical Observatory.