THE SCOTSMAN Friday, June 20, 1986

Edinburgh bitter over astronomy site choice

By SIMON BAIN

Edinburgh and Manchester reacted with bitter disappointment yesterday to the choice of Cambridge as the site for the Royal Greenwich Observatory, claiming that a small group of top scientists had brought unreasonable pressure to bear on the decision.

The Science and Engineering Research Council announced that its provisional selection of Edinburgh, agreed at a meeting three months ago, had been abandoned because "the community would not favour a move to Edinburgh," and it had therefore become "the least practical option."

Rather than move the RGO from its site at Herstmonceux Castle in Sussex to a site alongside the Royal Observatory in Edinburgh, or to Manchester where the Astronomer Royal and the Jodrell Bank Institute are based, the SERC has opted for Cambridge citing its strong academic base.

Edinburgh's strong claim on scientific grounds was overturned, as suggested in *The Scotsman* last week, largely because of the reluctance of key RGO staff to move from Sussex to a "remote" location.

But it was argued in Edinburgh and Manchester yesterday that the "consultation" since March had been superficial, and had sought the views of members of the Royal Astronomical Society and the Royal Society, many of whom had nothing to do with practical astronomy, without providing any information on which to base a view.

One senior astronomer said: "It is purely and simply the Cambridge prestige which counts very highly with the scientists. A lot of them have been associated with Cambridge. The SERC has taken the path of least resistance."

Prof Bill Mitchell, chairman of the SERC, said that as well as not being favoured by the astronomical community, a move to Edinburgh would mean disruption to the major project for building the William Herschel Telescope on La Palma in the Canary Islands.

It emerged that the "disruption" would be caused by the threatened resignation of some key staff if Cambridge were not chosen. A spokesman for the SERC said: "I haven't seen the evidence, and I don't know the reasons."

Prof Malcolm Longair, Astronomer Royal for Scotland, said Edinburgh was very disappointed, especially as the move would not solve astronomy's financial and managerial problems. He was seriously concerned about the long-term effect on the programme, and believed the consultation on the SERC's original decision had ranged extremely widely.

Councillor Richard Kerley, chairman of Edinburgh District Council's economic development committee, said: "We have put a great deal of work and effort into co-operating with the observatory to produce what would be a very good facility both for astronomers and for the public. We very much regret that a small group of people who prefer being within an hour's journey of London to movin to a more suitable site shoul have been successful in frustrating a sensible proposal."

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Scotsman 23-9-98

Obituaries

Dr Kashinath Nandy

Dr Kashinath Nandy, astronomer; former deputy chief scientific officer, Royal Observatory,Edinburgh

Born: 1 December, 1927, in Calcutta
Died: 18 August, 1998, in Edinburgh, aged 70

KASHINATH Nandy's distinguished career was spent almost entirely at the Royal Observatory in Edinburgh, where he gained an international reputation, notably for his work on the study of interstellar matter.

Born in Calcutta, he graduated with an MSc in applied mathematics at Silchar in Assam in 1951. Soon after graduation he taught and became assistant astronomer in charge of the Presidency College Observatory in Calcutta.

As he was principally interested in astrophysics, he applied for and won in 1959 a research grant of the International Astronomical Union. Planning to spend a year gaining practical experience in astronomy at the Royal Observatory, he enrolled as a postgraduate student at the University of Edinburgh and one year later was awarded an MSc degree in astronomy to add to his mathematics one.

Kashi stayed on, working for his PhD degree, which he gained in 1964. In the event, he was to remain in Edinburgh for the rest of his career, first as a research fellow, and then as a permanent member of staff of the Royal Observatory, rising rapidly in the ranks of the scientific personnel, and finally reaching the high position of deputy chief scientific officer on special merit.

The topic of his PhD thesis was *Interstellar Extinction in the Galaxy* and, though he took up many other astronomical problems in the course of his long career, this subject of interstellar matter remained his favourite on which he became a recognised international expert.

For his PhD subject he joined the already well known team of Edinburgh astronomers working on spectrophotometry under the leadership of Professor Hermann Brück. Baker, Butler, Seddon and Thompson had paved the way with their spectrophotmetric measurements of stellar spectra and had shown the main characteristics of the absorption band at 443 nanometers. Under the supervision of Dr V Reddish, Nandy studied how the raditation from the stars is altered by the interstellar matter before reaching us. As the main effect is that blue radiation is much more absorbed than the red one, we see the distant stars much redder than they actually are. Nandy devoted a great deal of his scientific life to studying the properties of this reddening of the stars.

In the early days, he made his observations with the 16/24-inch Schmidt telescope on Blackford Hill, where night after night he patiently took advantage of every clear spell, and every gap in the clouds to obtain objective-prism spectroscopic plates. His work on the optical extinction law is still definitive, expecially the discovery of the precise wavelength of the change in slope near 4300A.

When, in the late Sixties, the ROE opened an observing station in Italy, he was able to continue his work in the much improved climate there. He commenced a long collaboration with colleagues at the nearby Vatican and Rome Observatories, which continued even after his retirement. Indeed after his retirement, Dr Nandy was for some time a guest researcher at the Vatican, when he had an audience with Pope John Paul II.

In the early Seventies the ROE joined a European project to survey the entire sky using the 82/68 Ultraviolet Sky Survey Telescope aboard the TD-1 satellite. Dr Nandy was one of the Edinburgh team who operated this highly successful project with other participants from University College London, and the University of Mons and Institut d'Astrophysique in Liege.

As well as being instrumental in constructing what is still today the only sky survey in the ultraviolet, he extended his studies of interstellar extinction to an extensive analysis of ultraviolet extinction on the nearby Milky Way. This interest was then expanded further as he became the first from the UK to use the IUE on interstellar extinction problems, in particular the determination of the ultraviolet extinction in the Magellanic Clouds. Indeed, Dr Nandy was first to make unambiguous detection of the 2200A absorption feature in an external galaxy.

Over his career, he became well known for his work on other aspects of interstellar dust, including extinction in the near-infrared, scattering, the diffuse absorption bands, and polarisation, using a wide suite of telescopes including the Hubble Space Telescope. Other topics of special interest were dust models, intergalactic dust, hot stars and intermediate-band photometric systems. It was a characteristic of Kashi to be full of ideas and able to be among the first working in new areas of astronomical interest.

Dr Nandy was a firm believer in co-operation between institutions, having links also with the University of Cardiff, the Observatory of Vilnius, the Indian Institute of Astrophysics and the National Observatory of Athens and he was a keen member of the International Astronomical Union, being highly active at conferences and general assemblies.

Such joint efforts as these owed their success in no small measure to his talent for sharing and for friendship. When his collaborators from abroad visited Edinburgh on astronomical business they were as likely as not to be invited to stay in the Nandys' house and enjoy the renowned hospitality of his wife and family. In Edinburgh, he also took a willing share in university teaching. He gave specialist courses to undergraduate students, and co-supervised the graduate research of a number of PhD students, being for many years an honorary lecturer in the university's Department of Astronomy.

In recognition of his research achievements he was elected Fellow of the Royal Society of Edinburgh in 1974. He was also awarded a position of Honorary Research Fellow at University College, London, and, after his retirement, was made an Honorary Professor at the University of Wales in Cardiff.

His retirement from the Royal Observatory was marked with a symposium in his honour at which friends and colleagues presented papers on subjects associated with his work. The proceedings were published in 1987 in the Quarterly Journal of the RAS.

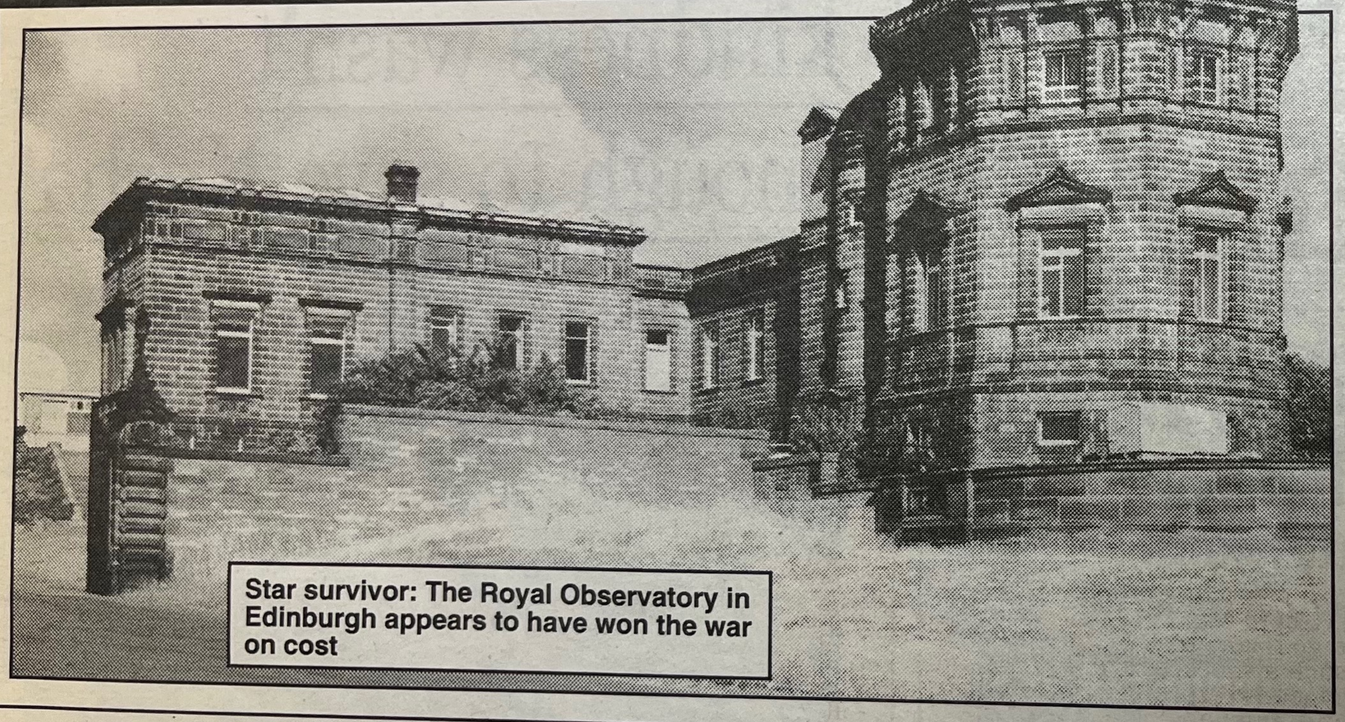
Dr Nandy's formal retirement in 1986 did not mean the end of his scientific activities. For him, astronomy was his hobby as well as his profession. He was able to keep up his collaboration with his colleagues at home and abroad right up to the end of his life, and he continued to attend meetings of the International Astronomical Union in various parts of the world. The last paper published by him, in May 1994, was an especially important one, describing measurements of the polarisation of the ultraviolet light from stars obtained with the Hubble telescope.

Kashi Nandy was one of the longest-serving members of the staff of the ROE, and one of the best loved. His associates and former students all speak of his boundless enthusiasm, his friendliness, his modesty and his helpfulness. Colleagues, some going back nearly 40 years, who worked with him and alongside him have remained also his personal friends.

He is survived by his wife, Smriti, their daughter, Sanjukta, and two grandchildren.

Contributed

Future looks bright for Star Wars victor



Star survivor: The Royal Observatory in Edinburgh appears to have won the war on cost

By COLIN LESLIE

STAR wars over which of Britain's two Royal Observatories should be axed look likely to end with Scotland victorious.

Insiders say the Royal Observatory in Edinburgh has won the battle on cost, leaving the Royal Greenwich Observatory in Cambridge facing closure. But news that more than 100 jobs in Edinburgh now look safe was met with mixed feelings yesterday by personnel in Scotland. Professor Andrew Lawrence, of the Institute of Astronomy, said: 'It is a peculiar kind of victory when your friends down south are on the streets.'

The landmark observatory, on Edinburgh's Blackford Hill, has been threatened with closure for two years, with the jobs of astronomers, engineers, technicians and researchers hanging in the balance following the privatisation of Government research establishments. In February the Particle Physics and Research Council, which manages both observatories, decided to close one of them in a bid to save up to £4million a year. One worker, who declined to be named, said reviews into cost-effectiveness had repeatedly found in favour of Edinburgh: 'But they have gone back again and again, because they don't seem to be happy with the answer they are getting.'

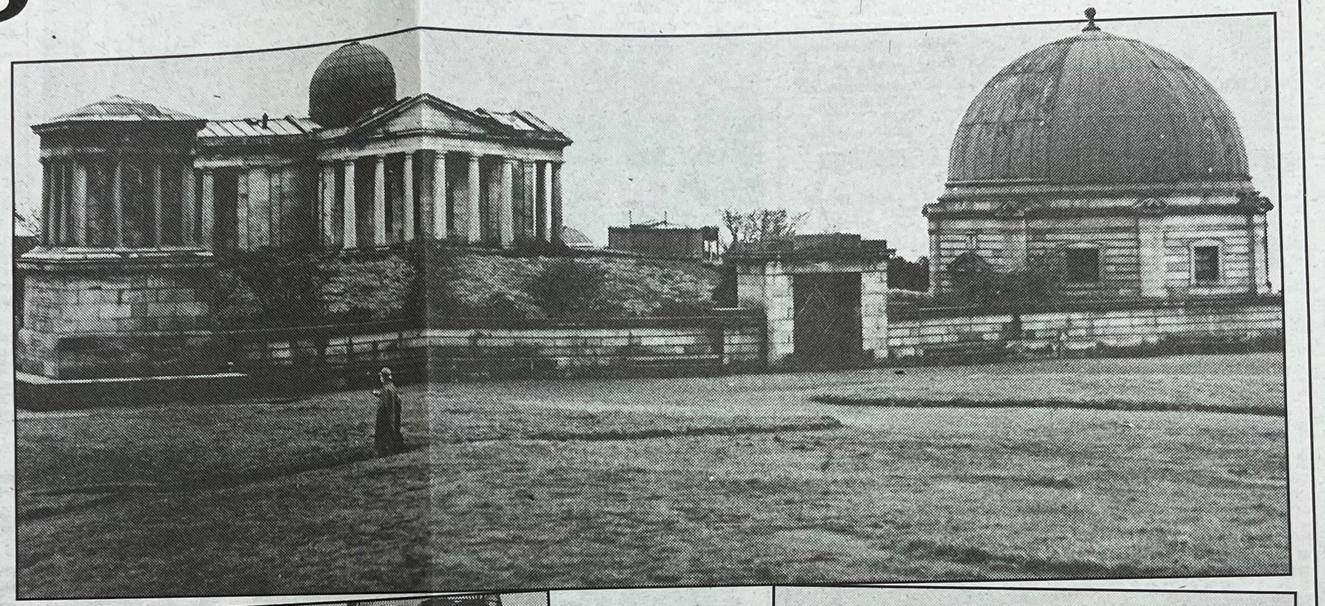
Science minister John Battle is expected to make an official announcement this week and the favoured observatory is likely to provide the site for an astronomy centre serving the whole of the UK. If the observatory survives, it will be repeating its feat of last century when threatened with closure in 1888.

On that occasion the Earl of Crawford donated his personal library to ensure the observatory could stay open.

Things are looking up

Edinburgh wins Observatory HQ over Greenwich

By ROBERT FAIRBURN



Above: The Edinburgh Royal Observatory. Left: Greenwich. Right: Directors Stuart Pitt and Adrian Russell.

FOR GENERATIONS, the Royal Observatory has stood proud on the skyline of Edinburgh.

And yesterday its future was secured as it was confirmed as Britain's astronomy headquarters.

But as its 200 scientists and staff celebrated, their joy was tinged with sadness that the decision had resulted in the closure of the historic Royal Greenwich Observatory.

British observation work takes place at foreign sites in Australia, Hawaii and Spain, with Edinburgh only used for research.

However, the Government's decision was welcomed as a victory for common sense by merging the activities of the two Royal Observatories and saving £2.4million over each of the next four years.

Moves to privatise the observatory service have also been dropped.

Professor Andy Lawrence of Edinburgh University's astronomy department resisted the temptation to say he was 'over the moon', but admitted there was widespread relief that closure had been avoided.

He said: 'We are obviously delighted with the decision to keep Edinburgh open, and that more money can be saved to be spent on astronomy projects for Britain.

'But obviously we feel for our friends in Cambridge where the Greenwich Observatory is now based.'

Professor Lawrence claimed there were three reasons why Edinburgh had been chosen ahead of Greenwich.

He said: 'The Government recognised the very important infra-red work which is taking place at Edinburgh and the technical skills which will be required in astronomy for the next 20 to 30 years.

'Ministers also judged our records on technical projects over the last ten years and were obviously impressed.

'Thirdly, they have taken into account the very close relationship with Edinburgh University where the facilities such as libraries and even canteens are shared.'

The Royal Observatory dominates the Edinburgh skyline from its vantage point on the city's Blackford Hill. Its Graeco-Italian towered temple embellished with the signs of the zodiac was built in 1896.

It had been transferred from the smoke-stack atmosphere of Calton Hill, which scientists deemed was not suitable for star gazing.

Although it is no longer an observation post a significant amount of research work is carried out.

Its ground-breaking work developing infrared rays is seen as the way forward in identifying distant objects in the Universe, rather than the traditional optical wavelength approach.

This year its scientists also developed a new screening device to detect breast cancer in women.

Junior Trade and Industry Minister John Battle said that the decision to retain Edinburgh would save a further £4million each year from 2001 onwards. He said: 'The Particle Physics and Astronomy Research Council has decided to concentrate the work it funds at the Royal Greenwich Observatory which is based at Cambridge, and the Royal Observatory Edinburgh in a new UK Astronomy Technology Centre at Edinburgh.

'This new name will better reflect the fact that the Royal Observatories are now really observatories in name only. Their main function is to provide technological support for the telescopes operated by PPARC on behalf of British

Mr Battle revealed that under plans of the previous Government management of UK telescopes and the work of the Royal Observatories would have been subject to competitive tendering.

He said he had decided to follow PPARC's advice to release it from this obligation 'in line with our long-standing opposition to dogmatic privatisation'.

Mr Battle added: 'The concentration at Edinburgh will take place over some years. The Royal Greenwich Observatory is an historic institution with a great tradition that has already survived two changes of location. I am asking PPARC to explore every possible avenue for keeping the institution alive.'

The Royal Greenwich Observatory was founded in the 17th century by Charles II to help measure the Greenwich meridian on which Greenwich Mean Time is based.

The original building on the zero-degrees' longitude line in Greenwich Park is now a museum. Its scientists moved to East Sussex in 1948 when the glare from London's lights became too bright for observations, and they moved again to Cambridge in 1990.

Scotsman April 1996

Royal Observatory under threat from privatisation

Closure: *Edinburgh staff consider management buy-out to secure jobs and future of historic resource*

ELIZABETH QUIGLEY

THE Royal Observatory in Edinburgh faces possible closure by next April under the Government's plans for privatisation.

Around 100 jobs would be lost and staff are already looking at the possibility of a management buy-out with the help of Lothian and Edinburgh Enterprise Ltd.

Ian Taylor, minister for science and technology, accepted recommendations yesterday that both Edinburgh and the Royal Greenwich Observatory in Cambridge should be privatised as they are not considered "viable, individually or combined". The management of the two telescope sites in Hawaii and the Canary Islands is to be contracted out.

Edinburgh University is expected to make a bid to keep the skills and personnel in Scotland, but other companies and research councils are keen to take over both observatories and then merge the resources at another centre in the south of England.

Tony Bell, of the Institution of Professionals, Managers and Specialists, which represents staff at both observatories, warned of the dangers of bringing in outside contractors who would put profits before science. "It is all being done in the name of cost-cutting caused by inadequate funding," he said.

"Even if universities take over the running of the observatories it could mean that other educational institutes and students are denied training access. Privatising the technical support services and contracting out the management facilities services to private firms with no specialist knowledge or interest in science means an uncertain future for the staff and long-term research."

Professor Andy Lawrence, head of the Institute of Astronomy at Edinburgh University, hopes that the university will play a major role in keeping the observatory running in collaboration with other Scottish universities and colleges.

"Along with other astronomists, I want to find the best scientific solution and I want to see the establishment of an astronomy centre," he said. "I care more about the future of the top international staff at both Edinburgh and Greenwich than questions of ownership and management."

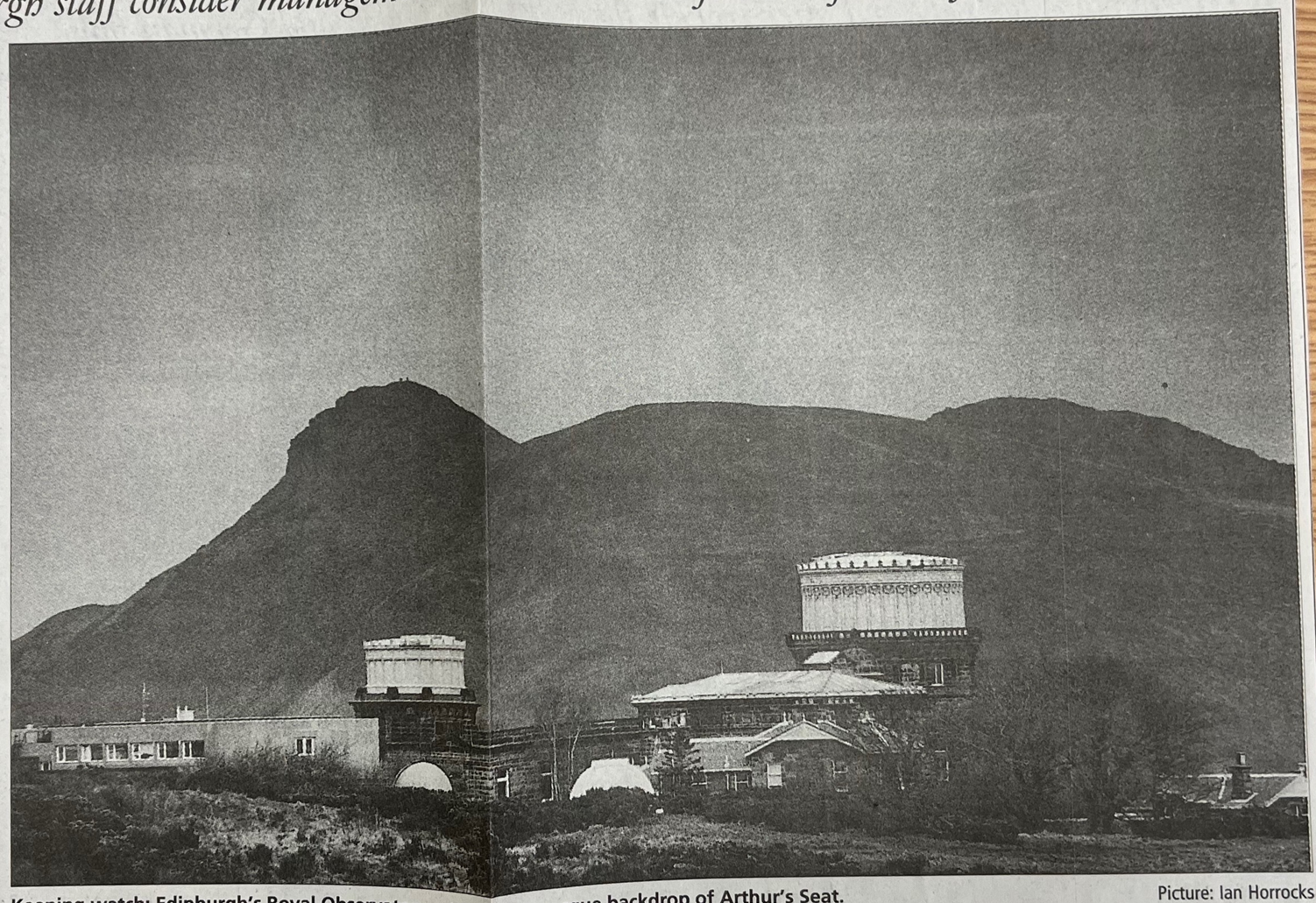
Last year, the Royal Observatory in Edinburgh was initially recommended by the Particle Physics and Astronomy Research Council to be the home of a new astronomy technology centre, but then the final decision was postponed and later shelved. It was the third time in ten years that Edinburgh had been recommended for an astronomy project only to lose out.

"Losing the Royal Observatory would be a tragedy for Scotland and a great loss for this area. It's the best place in the world for astronomy," said Dr Alistair Glasse, project scientist at the observatory.

"The Government may pay lip service to keeping an observatory in this spot but that might only be a visitor centre selling postcards. This place would end up like the Calton Hill observatory – great views but no signs of work on the cutting edge of astronomy."

Nigel Griffiths, Labour MP for Edinburgh South, who has previously called for the Scottish Secretary to act on Edinburgh's behalf over the siting of an astronomy technology centre, is meeting Michael Forsyth to discuss the observatory's future.

"This could destroy our history of astronomy going back 300 years," Mr Griffiths said. "The disaster for Scotland is not just the closure, it's that many of the individuals will not end up on the dole – they will be lost to France, Germany or America."



Keeping watch: Edinburgh's Royal Observatory, with the picturesque backdrop of Arthur's Seat. Picture: Ian Horrocks

Scotsman

Saturday, 6 February 1993

NEWS IN BRIEF

Observatory chief defends jobs merger

THE new director of the Royal Observatory at Edinburgh and the Royal Greenwich Observatory, based in Cambridge, yesterday defended the decision to appoint one person to run both institutions.

The merging of the top posts at two of Britain's leading astronomy centres sparked controversy when proposed last year.

But Prof Alec Boksenberg, the current director at Greenwich, who was chosen for the dual job, said that scientific advances made the work done at the two observatories more similar than it used to be.

His appointment was welcomed by Dr Peter Brand, the head of Edinburgh University astronomy department. But Dr Brand also stressed the importance of making someone of similar standing the regius professor of astronomy at Edinburgh. The post has been vacant for over two years.

Scotsman 21-6-95

Capital may lose out on winning astronomy centre

By Elizabeth Quigley

EDINBURGH could lose out to Cambridge in the bid to be Britain's leading centre for astronomy.

The Royal Observatory in Edinburgh was the front runner to be the home of a new astronomy technology centre but the research council involved has postponed the decision until September – a delay some Edinburgh scientists believe will cost them the centre.

If it is awarded to the Greenwich Observatory in Cambridge, it will be the third time in ten years that Edinburgh has been initially recommended for an astronomy project only to lose out.

An astronomy technology centre would be responsible for developing and building telescopes and instrumentation and would attract the bulk of funding available for such work. A panel set up by the Particle Physics and Astronomy Research Council has already recommended that the centre should be in Edinburgh but now the council says more information is required.

"The research council has to take other factors into consideration – both financial and political – before they make their decision," said Professor Andy Lawrence, head of the Institute of Astronomy at Edinburgh University.

"The centre which is awarded the ATC will stay the same and then grow and the other will be severely reduced. Not getting the ATC would make a very serious difference."

At September's meeting PPARC will also consider a third option of not setting up an ATC at either of the observatories, which would cut costs but would lead to staff and funding reductions at both sites instead of only one.

Prof Lawrence said he would be disappointed if Edinburgh lost out again to Cambridge but more disappointed if they both lost out and plans for an ATC were shelved.

"The whole future of both observatories has been uncertain for at least 18 months and is uncertain again," he said. "PPARC needed to come to a firm and swift decision and they failed to do that. It looked as if they were going to do that at the last meeting but they didn't do anything."

Nigel Griffiths, Labour MP for Edinburgh South, wants the Secretary of State for Scotland, Ian Lang, to intervene on Edinburgh's behalf and will table questions in the House of Commons later this week.

"Once again it's a case of the rules being changed after Edinburgh has passed the finishing line. In the past five years the status of the Royal Observatory in Edinburgh has been downgraded. We used to have an astronomer royal in Edinburgh and we have now lost that," he said.

A spokesman for PPARC said the only reason the decision was postponed was because the committee needed more detail about the two offers.

Scotsman 4-2-92

Astronomer claims plan is threat to observatory

By Sarah Wilson

THE world-famous astronomical observatory in Edinburgh is in danger of losing its international status and becoming a second-rate institution, a leading astronomer stated yesterday.

Dr Peter Brand, the head of the astronomy department at Edinburgh University, said plans to merge the directorships of the Royal Observatory Edinburgh and the Royal Greenwich Observatory meant "there is a distinct danger that the Edinburgh observatory will not be able to attract the scientific brains that it has now and Edinburgh will lose its international reputation in the field".

The Government-funded Science and Engineering Research Council, which finances the two institutions, plans to appoint a civil servant to oversee them both.

No permanent director of the ROE has been appointed since Professor Malcolm Longair moved to Cambridge in 1990.

Dr Brand explained: "My concern is that when they add this new layer of administration, the SERC will not appoint an eminent scientist of Prof Longair's calibre to direct the observatory. It is conceivable that they will down-grade the post by offering less money and less status and control.

"As an institution we can only exist as a centre of excellence. We are spending tax-payers' money and if we stop being world beating there is little point in our continuing as a second rate institution."

As well as managing the observatory, Prof Longair was the Regius professor of astronomy at Edinburgh University, with which goes the honorific title of Astronomer Royal for Scotland. Since he left, the post of Astronomer Royal has remained vacant.

The Edinburgh observatory is over a century old and the directorship of the Greenwich Observatory in Cambridge dates from the appointment of John Flamsteed in 1675. The directorships of both centres have traditionally been extremely prestigious appointments in the astronomical field.

A spokesman for the SERC said that the post of director of the ROE was not under threat. It had been filled on a temporary basis while the future structure of the observatories was being considered.

Scotsman 4-3-91

No-confidence motion passed as observatory staff fear cuts

By Linda Kennedy

STAFF at the Royal Observatory, Edinburgh, have passed a vote of no confidence in their acting director, as a question is raised again over its future.

Funding cuts in astronomy mean that either the ROE or the Royal Greenwich Observatory in Cambridge is likely to be contracted.

Both observatories are seeking to convince a Science and Engineering Research Council review committee that their establishment should become the main centre.

But, following the ROE presentation, staff in Edinburgh last week passed a vote of no confidence in their acting director, Dr Paul Murdin. Staff do not believe he is the best person to present the ROE's case. Senior management at Edinburgh, including the deputy director, are to make a second presentation to the SERC at a meeting in Swindon on Friday.

The risk to the ROE comes just two months after threat of closure or merger with Cambridge was denied by the Astronomer Royal, Professor Arnold Wolfendale. At the time, the secretary of the observatory, Stuart Pitt, also said there was no chance of the observatory closing or amalgmating with the Greenwich Observatory.

Magnus Paterson, secretary of IPMS, which is the largest union at the ROE, said employees had acted when they realised moves to merge the two observatories in Cambridge were "stronger than we thought".

He added: "Staff at ROE met on Friday, and decided they were not happy with the way things were being done. The staff took a vote of no confidence in the acting director, who is on secondment from the Greenwich Observatory in Cambridge. We are not convinced he is the best man to fight our corner."

Mr Paterson said that if the decision was taken to enhance Cambridge's role, the workforce of 120 at Edinburgh would be cut to between 40 and 50. Although sections of the observatory — such as the visitors' centre — would remain, all the technology would be moved to Cambridge.

Dr Murdin, who was contacted in Cambridge, refused to comment on the no confidence vote. He said: "The Royal Observatory Edinburgh has an international reputation for excellence. I am very proud to be associated with it."

Staff are to meet again this morning to decide what further action can help save the ROE. Steps are likely to include writing to MPs highlighting the ROE's links with local schools and industry.

Senior management at the ROE confirmed another presentation would be made on Friday. But Dr Bob Stobie, the deputy director, said he was not free to discuss a vote of no confidence in the acting director, or any internal matters. But he added: "The staff are very concerned about the way things are going. I and senior staff at the observatory have been working on preparing a case for what we see as a better way forward for British astronomy."

Nigel Griffiths, the Labour MP for Edinburgh South, who met staff at the observatory, said he would be pressing for a debate in the Commons about astronomy funding and the future of the ROE. "I think there will be an outcry in Edinburgh if the ROE had a diminished role," he said. "It is yet another example of jobs and organisations flowing south."

Edinburgh bitter over astronomy site choice

By SIMON BAIN

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The Science and Engineering Research Council announced that its provisional selection of Edinburgh, agreed at a meeting three months ago, had been abandoned because "the community would not favour a move to Edinburgh," and it had therefore become "the least practical option."

Rather than move the RGO from its site at Herstmonceux Castle in Sussex to a site alongside the Royal Observatory in Edinburgh, or to Manchester where the Astronomer Royal and the Jodrell Bank Institute are based, the SERC has opted for Cambridge citing its strong academic base.

Edinburgh's strong claim on scientific grounds was overturned, as suggested in *The Scotsman* last week, largely because of the reluctance of key RGO staff to move from Sussex to a "remote" location.

But it was argued in Edinburgh and Manchester yesterday that the "consultation" since March had been superficial, and had sought the views of members of the Royal Astronomical Society and the Royal Society, many of whom had nothing to do with practical astronomy, without providing any information on which to base a view.

One senior astronomer said: "It is purely and simply the Cambridge prestige which counts very highly with the scientists. A lot of them have been associated with Cambridge. The SERC has taken the path of least resistance."

Prof Bill Mitchell, chairman of the SERC, said that as well as not being favoured by the astronomical community, a move to Edinburgh would mean disruption to the major project for building the William Herschel Telescope on La Palma in the Canary Islands.

It emerged that the "disruption" would be caused by the threatened resignation of some key staff if Cambridge were not chosen. A spokesman for the SERC said: "I haven't seen the evidence, and I don't know the reasons."

Prof Malcolm Longair, Astronomer Royal for Scotland, said Edinburgh was very disappointed, especially as the move would not solve astronomy's financial and managerial problems. He was seriously concerned about the long-term effect on the programme, and believed the consultation on the SERC's original decision had ranged extremely widely.

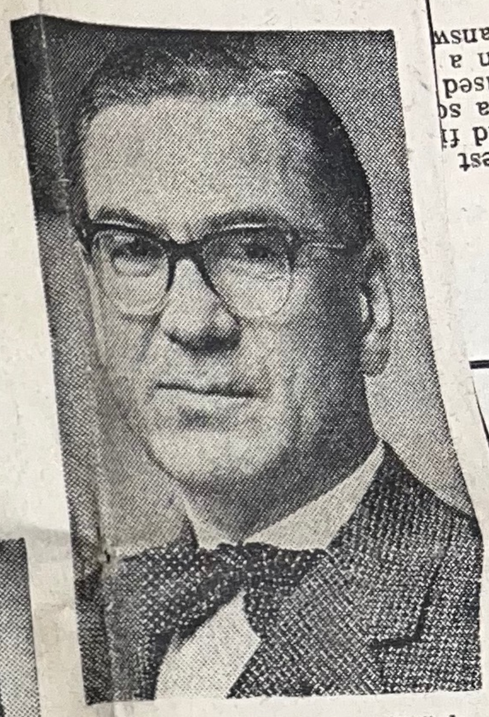
Councillor Richard Kerley, chairman of Edinburgh District Council's economic development committee, said: "We have put a great deal of work and effort into co-operating with the observatory to produce what would be a very good facility both for astronomers and for the public. We very much regret that a small group of people who prefer being within an hour's journey of London to moving to a more suitable site should have been successful in frustrating a sensible proposal."

He added: "It strikes me as utterly bizarre that people who measure time in light years should think that Edinburgh is a black hole on the other side of the moon."

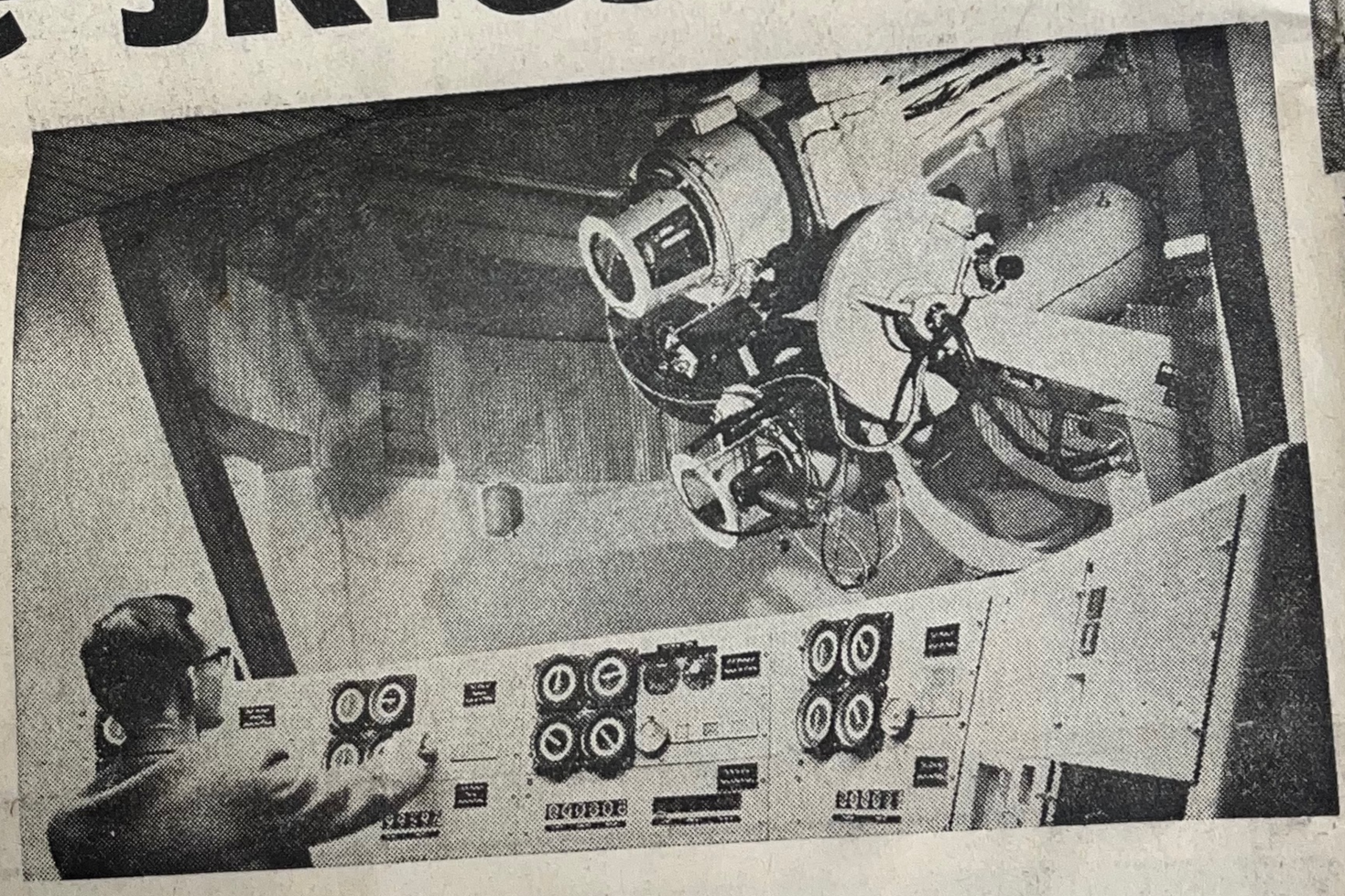
The Week-end Scotsman

SATURDAY, MARCH 29, 1969

Watchers of the skies



Professor H. A. Brück, Astronomer Royal for Scotland: "Modern astronomy is not just a case of people looking through telescopes in darkness. The astronomer is a member of modern industrial society, his technical staff is highly trained, and his equipment very sophisticated indeed."



LEFT: The twin 16-inch telescope and control room in the Royal Observatory, Blackford Hill, Edinburgh.

Scotland's contribution to astronomy is both considerable and significant. Work being done in this increasingly important branch of science at observatories in Edinburgh, Glasgow and St Andrews has its place in the international pattern of study. Report by

JEREMY BRUCE-WATT

HOWEVER specialised their studies, and however sophisticated their equipment, Scotland's observatories can never become world centres of optical astronomy, even if that was their ambition.

The Scottish sky at night tends to be overcast and optically useless for upwards of 250 nights of the year, a climatic hazard which suggests to the uninformed layman that the country's contribution to this fundamental and spectacularly revived branch of science must be wholly theoretical, or at least confined to the training of students and the processing of material sent in from elsewhere. Such an impression

elegant observatory was built early last century on the Calton Hill and placed under the charge of the Professor of Astronomy with the new title "Astronomer Royal for Scotland." This first Royal Observatory quickly attracted international interest through the work of Thomas Henderson, one of the first astronomers to measure the distance of a star.

With the expansion of Edinburgh and its industry, it was only a matter of time before serious astronomical observation became impossible from the observatory's central site, and the move to Blackford Hill was made in 1896. Here the forte was the measurement of

of the year was partly the outcome of Professor Bruck's close friendship with leading Italian astronomers for some 30 years. It was enthusiastically taken up.

"We paid next to nothing for it, and now we have a very beautiful building staffed entirely by us as a kind of enclave—although as time goes on I hope we shall develop the closest possible ties with the Rome Observatory itself."

Leaving on the first plane from Edinburgh, Professor Bruck or one of his staff can be on the Rome Station by lunchtime, and can return a few days later with hundreds of photographic plates—enough to keep

work, but we expect to be able to announce the results to the world in another couple of months.

"This will be the very first completely automatic plate-measuring machine in the world producing figures to the nearest micron — the highest accuracy you can get."

When he took over from Professor W. M. H. Greaves, his distinguished predecessor, Professor Bruck had to decide whether the Royal Observatory, in its bad climate for optical astronomy and equipped with modest or insignificant telescopes, should aim to compete with the Americans, with their

request from the Science Research Council for his revised memorandum on the establishments of a large British Northern Hemisphere telescope.

"The SRC have just completed a review of astronomy in the Southern Hemisphere, and their intention is to change the focal point of activities from South Africa to Australia. Here will be set up a 150-inch telescope, and what will be in effect a partly British Southern Hemisphere Observatory.

"The point I have stressed for years is that the Southern Hemisphere is not the only place for modern astronomy

JEREMY BRUCE-WATT

HOWEVER specialised their studies, and however sophisticated their equipment, Scotland's observatories can never become world centres of optical astronomy, even if that was their ambition.

The Scottish sky at night tends to be overcast and optically useless for upwards of 250 nights of the year, a climatic hazard which suggests to the uninformed layman that the country's contribution to this fundamental and spectacularly revived branch of science must be wholly theoretical, or at least confined to the training of students and the processing of material sent in from elsewhere. Such an impression couldn't be more false.

Scotland has three astronomical establishments. The main one is the Royal Observatory in Edinburgh, under the charge of the Astronomer Royal for Scotland, Professor H. A. Bruck. Professor Bruck is also Regius Professor of Astronomy at Edinburgh University, and his department is conveniently and appropriately housed within the Observatory compound on Blackford Hill.

For both establishments, Bruck's regime has been a dynamic and fruitful one. He came to Edinburgh in 1957 from Dunsink Observatory, near Dublin, where he had been director for the previous 10 years, and Professor of Astronomy in the Institute for Advanced Studies.

Since then, his Edinburgh staff has grown from an initial dozen to over 80, including lecturers, research fellows, engineers and technicians. In theory the University department is a separate entity within the impressively diverse community on Blackford Hill, but in practice it is very closely integrated.

The professor himself says: "I like to think of our establishment as ideal—one where students and a university department work side by side with an observatory which is one of the six major scientific establishments responsible to the Science Research Council."

Edinburgh University's Regius Chair of Astronomy was founded in 1786. Playfair's elegant observatory was built early last century on the Calton Hill and placed under the charge of the Professor of Astronomy with the new title "Astronomer Royal for Scotland." This first Royal Observatory quickly attracted international interest through the work of Thomas Henderson, one of the first astronomers to measure the distance of a star.

With the expansion of Edinburgh and its industry, it was only a matter of time before serious astronomical observation became impossible from the observatory's central site, and the move to Blackford Hill was made in 1896. Here the forte was the measurement of time and the construction of high-precision clocks. Today, the main interest centres on applied physics, specialisation in instrumentation, and the design and manufacture of the high precision instruments upon which modern astronomy relies for its discovery and progress.

As Professor Bruck says: "I thoroughly believe that one ought to do much better than astronomers have done for some time by introducing modern technology into our measuring processes, and we go in for this in a relatively big way." The Royal Observatory is, in fact, the most automated in Britain, and takes part in space research projects involving rockets fired from Woomera, or from Sardinia as part of the ESRO programme.

From a small outstation at Earlyburn, near Peebles, observatory staff track the paths of satellites, as many as 30 of which may be recorded by kine-theodolite on a single clear night. In addition to this, the observatory workshops have just completed a modern tracking instrument which will feed its information onto computer tape.

One of the major developments during Professor Bruck's term of office has been the establishment of an outstation of the Royal Observatory in the grounds of the Osservatorio Astronomico di Roma, at Monte Porzio, 20 miles south-east of Rome. The offer to Scotland of a site where conditions for observation are ideal for most of the year was partly the outcome of Professor Bruck's close friendship with leading Italian astronomers for some 30 years. It was enthusiastically taken up.

"We paid next to nothing for it, and now we have a very beautiful building staffed entirely by us as a kind of enclave—although as time goes on I hope we shall develop the closest possible ties with the Rome Observatory itself."

Leaving on the first plane from Edinburgh, Professor Bruck or one of his staff can be on the Rome Station by lunch-time, and can return a few days later with hundreds of photographic plates—enough to keep the Edinburgh laboratories occupied for many weeks. Needless to say, the expense of the fare and subsistence comes to very much less than the time spent waiting until conditions permit for the same work to be done in Edinburgh.

The observatory now collects its data with four telescopes. Blackford Hill operates a 36in reflector, a 16-24in Schmidt telescope, and a twin 16in reflector. A fourth telescope —another 16/24in Schmidt camera—is working at Monte Porzio.

The observatory has developed its own machines to handle the data, furthering such work as deducing the chemical composition of certain types of stars through analysis of their spectra, gaining information on the diffuse inter-stellar matter out of which stars are formed.

"Take the example of a star plate with ordinary star images. If you have a good modern telescope you can get thousands of images on a single plate. If you really want all the information it can offer, you are forced to measure thousands of images in one way or another. The old method was that a chap sat down and he measured each one individually.

"We have gone all out for completely automatic plate-measuring action. We handed it over to industry, and an electronics firm are just finishing their development of it. It has been many years work, but we expect to be able to announce the results to the world in another couple of months.

"This will be the very first completely automatic plate-measuring machine in the world producing figures to the nearest micron — the highest accuracy you can get."

When he took over from Professor W. M. H. Greaves, his distinguished predecessor, Professor Bruck had to decide whether the Royal Observatory, in its bad climate for optical astronomy and equipped with modest or insignificant telescopes, should aim to compete with the Americans, with their enormous telescopes and ideal climate.

"I asked myself, was it worth it? Or should we give up observational astronomy altogether? On the other hand, there were, and are, very distinct weaknesses on the American scene, and I decided that we should compete."

Policies and projects at Blackford Hill were aligned, and re-aligned, accordingly. The early 1960s saw a major expansion of the resources and staff of the Observatory, and in 1965, the reorganisation of civil science in the United Kingdom placed the Royal Observatory under the wing of the new Science Research Council.

If the Scottish outstation in Rome has been the project of most concern to him, it has now been replaced by a new ambition to see the Northern Hemisphere accorded what he considers to be its just place in British astronomy. On the day he was interviewed for "The Weekend Scotsman," Professor Bruck had received a request from the Science Research Council for his revised memorandum on the establishments of a large British Northern Hemisphere telescope.

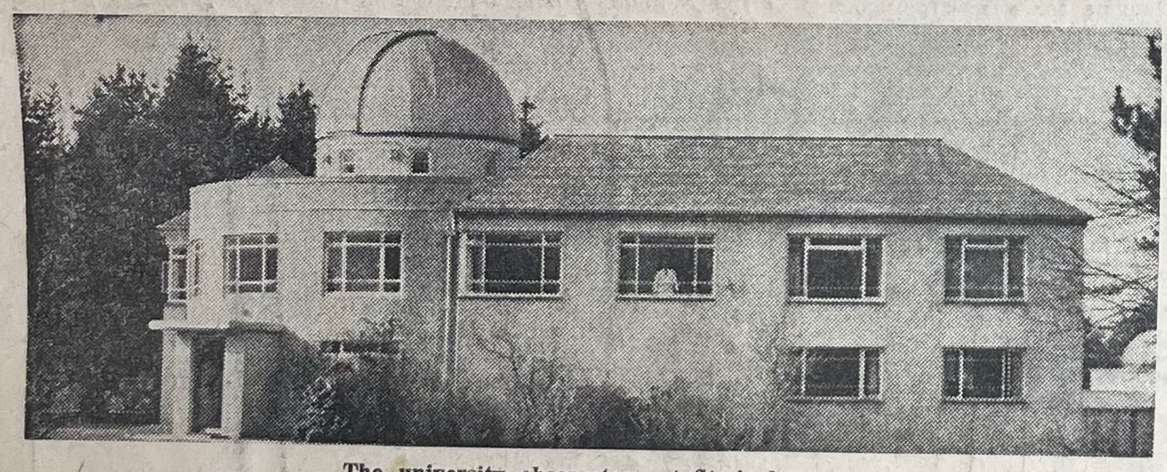
"The SRC have just completed a review of astronomy in the Southern Hemisphere, and their intention is to change the focal point of activities from South Africa to Australia. Here will be set up a 150-inch telescope, and what will be in effect a partly British Southern Hemisphere Observatory.

"The point I have stressed for years is that the Southern Hemisphere is not the only place for modern astronomy. The Northern Hemisphere is quite as important, and I think it sad that whereas you have these very important discoveries by the radio astronomy institutions—Britain has the best in the world—we don't have the facilities to find out what happens to these objects optically.

"As it is, we simply can't compete. All observation of these things is done in America. We have next to nothing. I am pressing for the creation of a really large telescope which would cope with these very faint objects, and for the mounting of such an instrument in a good climate—perhaps Italy, perhaps Spain—but sufficiently close to home for us to operate it from Britain."

If and when the plan is realised, it will mean an entirely new situation in British astronomy, and one in which the Edinburgh Royal Observatory and the associated university department, will have an influential and gratifying stake.

St ANDREWS: A tradition that's three centuries old



The university observatory at St Andrews.

AS MIGHT be expected of Scotland's oldest university, the study of astronomy at St Andrews has continued for more than three centuries.

The first famous scholar was James Gregory, the outstanding pioneer of the reflecting telescope. While Regius Professor of Mathematics at St Andrews from 1668 to 1674, he built and equipped the first observatory of its kind in Britain. The university still preserves five of the astronomical instruments he used, including an early pendulum clock and an astrolabe.

The university's modern Department of Astronomy was founded in 1938, and acquired its modern observatory in 1941. The Chair of Astronomy, named in honour of John Napier, the inventor of logarithms, was created in 1950.

The three observatory buildings on the west side of the town are set in university parks and overlook St Andrews Bay. The Gregory Building contains the 37-inch Cassegrain Schmidt telescope — the largest in Britain until the recent completion of the 98-inch Isaac Newton telescope at Herstmonceux.

The observatory also uses an 18-inch Cassegrain Schmidt telescope, a 16-inch Nishimura reflector and a 6-inch Zeiss Coudé refractor. The flat roof of the Napier building is designed as an observation platform on which smaller portable telescopes can be set up.

St Andrews University awards an honours degree in Astronomy, taken either as a single subject or jointly with Mathematics, Applied Mathematics or Physics.

The Astronomy Department's research interests cover both the observational and theoretical aspects of the subject.

Professor D. W. N. Stibbs is Napier Professor of Astronomy and director of the university observatory.

GLASGOW: New observatory has key role to play

Professor Peter Sweet and the new Glasgow University Observatory.

A NEW chapter in astronomy in Glasgow opened this month with the commissioning of the new university observatory off the Maryhill Road on the north side of the city. This £100,000 installation, contained in an attractive crenellated building with two attendant domes, is Glasgow's fourth observatory since the founding of the university Chair of Astronomy in 1760.

The first building, the Macfarlane Observatory, stood in what were then university grounds beside the High Street. Alexander Wilson, the first Professor, gained international recognition for his work on sunspots. In 1843 a second site was taken at Dowanhill, and here the university maintained its place in international astronomy by systematic observation of stellar movements. At that time, rapidly evolving ideas about the size and shape of the galaxy were based on work of this kind.

Serious optical astronomy again became impractical in Glasgow because of the conditions created by industry, and in 1938 the Dowanhill Observatory was replaced by a smaller students' building in University Gardens. When in turn that site was required for a Women's Union, the university took the opportunity of restoring to its astronomy department the appropriate practical facilities.

The new observatory has a 20-inch reflecting telescope, a solar tower, and provision has been made for the eventual addition of a small radio telescope. With its research and student laboratories, and well-equipped workshop, the observatory will play an increasingly important part in the whole study of astronomy in Glasgow.

The head of the department is Professor Peter A. Sweet. "What we had to have here was a kind of research instrument which we could demonstrate for teaching purposes. A small optical telescope is a good teaching instrument as well as necessary for research purposes. One of the best instruments for teaching is the solar telescope, and that where our coelostat will be important."

Thanks to special equipment, most of the undergraduates' time will be spent on simulated observations. Stars and constellations are reproduced in the laboratories, allowing practical work at any time with instruments used for observing and interpreting the results. The old difficulty of giving practical instruction to students in the British climate has been overcome.

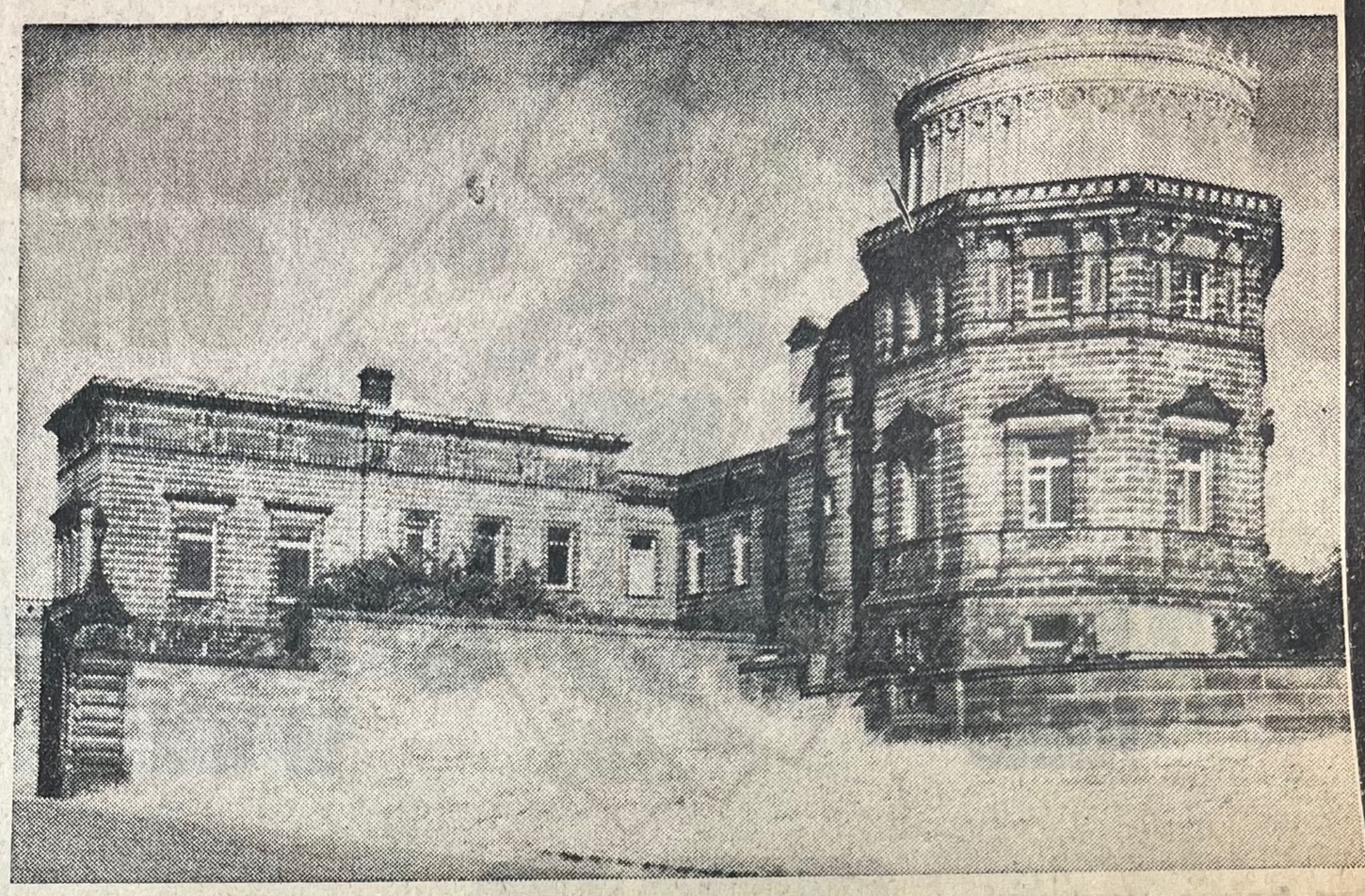
On the practical side the observatory will study solar flares, and is to specialise in the design of instruments for use in conjunction with solar and optical telescopes, particularly in the study of polarised light.

If astronomy as a subject has lost much of its nineteenth-century prestige within and outside the university—thanks mainly to the great vogue in nuclear physics—today it shows every sign of reinstatement. There is certainly no suggestion of a poor relation in Garscube Road.

JAMES McGHEE

REPORTING on the Royal Observatory on Blackford Hill, Edinburgh, where, it has just been announced, scientists have been given the task of setting up a new Northern Hemisphere observatory, to keep Britain ahead in space research.

AIMING FOR THE STARS... FROM A CITY HILLTOP



UP there on a wet, blustery day, high above the noise of the Capital, there is an atmosphere of an embattled frontier post of the Empire that was.

Wind howling, rattling the windows to get in. Inside, regimental cleanliness, precise order. When you're scanning infinity precision becomes a habit.

So it has at Blackford Observatory, where sits in office the Astronomer Royal for Scotland.

Professor H. A. Bruck, who is also head of Edinburgh University's Department of Astronomy, has seen the standing of his science rocket with the space programme. Now work that took years when he came to Edinburgh 15 years ago is done in days. Astronomy has come of age and his observatory is playing a big role in extending the frontier of knowledge.

"I have always made a point since I came here — in view of the fact astronomy was a small corner of science — that we had to make the most of what we had."

But standard equipment was inadequate and so, he added matter-of-factly, they had to develop their own gadgetry, as he calls the invaluable instruments his observatory and department have given to astronomy.

He talks cohesively, not inviting interruption, but stopping frequently to ask: "Yes?" You understand? He makes it clear, despite his heavy German accent, that he is proud of his garrison.

Today, he says, weighing his words, Blackford Observatory is one of the most advanced.

Among its prized possessions is Galaxy, the machine created there recently. Using it, they have measured more stars in a year than all previous astronomers together.

Using a special camera, astronomers can get ten to 100,000 stars on one photographic plate. The difficulty in the past was measuring them. But Galaxy has now taken over this time-consuming chore.

"What this machine does is make it possible for astronomers to get the absolute utmost from photographs," said Professor Bruck.

So valuable has this machine become that astronomers throughout Britain send their photographic plates to Blackford for processing.

But Galaxy is just one instance of the observatory's policy of, "Give us the tools and we'll do the job" — then make better tools.

We have developed several instruments to make the best use of the information our telescopes give us," said the professor.

They have been made as an answer to the challenge of the mammoth amount of information that pours in from the battery of telescopes on the hill and from Blackford's out-stations in Peeblesshire and Italy.

The Italian site gives astronomers 200-250 cloud-free viewing days a year.

"Before," says Professor Bruck, recalling the first time he looked through a telescope into infinity, "it was very simple.

"Simply enjoying the stars is not the way astronomy is done now.

"You can look at the Moon or close planets and that is very nice, but if you look at stars you only see spots of light.

"Now the telescope collects as much information as possible then throws that into some very complex gadgetry. At the end of the day you get perhaps a plate or a computer tape.

"In the old days our instruments were relatively modest. Now the observatory is worth millions of pounds and spends £300,000 or £400,000 a year."

All these funds and expensive hardware did not fall into his lap, however. "It took me quite a while to persuade the Scottish Office to back us."

That was about the time the first Sputnik went up — "We were the very first people to make contact" — and Blackford's scientific arsenal has been built up mainly since then.

One item of that hardware is currently following the path of its predecessors — around the Earth, approximately every 90 minutes.

It is the latest and probably the last of the observatory's ventures into the world of rockets and satellites.

The instrument is a special telescope mounted in a satellite launched as a combined European effort to stay up more than a year.

Professor Bruck said the telescope was so mounted that it swivelled as the satellite circled the planet to take in comprehensive views of the heavens.

"Three chaps in the observatory have the task of sorting out all the information it sends. Looking through all the data is an enormous job.

"But at the end of the day we ought to have a wonderful atlas of the sky."

He explained the atlas would also show the ages of stars or planets because varying amounts of ultra-violet ray were given off by them, depending on their age.

But the present project is likely to be Blackford's last of this kind.

"I have decided, rightly or wrongly, that we have now done enough in rocketry. We are now concentrating on the new realm of infra-red work.

"This is very much the thing of the future. This country is only starting now, but I hope we will catch up with America before long.

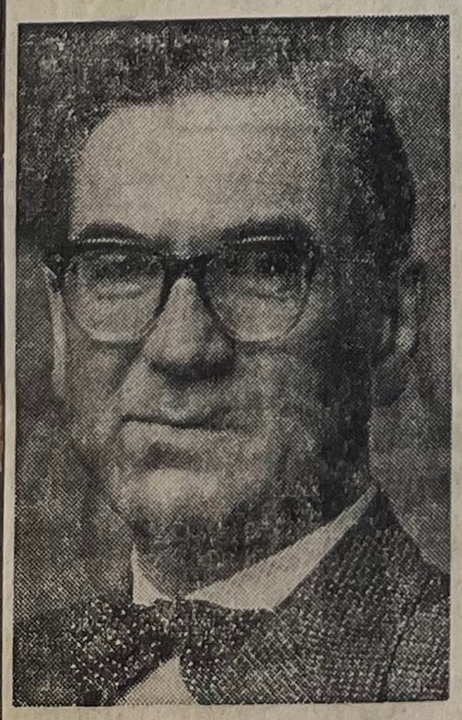
"Infra-red tells you about things in space which are very exciting, inter-stellar dust, for example."

"No-one knows what it is made of or how it got there. All we know is that it is very important to star formation."

An expedition force from the observatory are now in Tenerife using an infra-red radio wave system; another is off to Pretoria, South Africa. Both groups will add to Blackford's know-how.

"For infra-red you need as dry a climate as possible or a very high altitude," he explained.

"A great many of my colleagues would agree it is a most exciting part of physics. I am very happy we can take a major part in this important development."



Professor Bruck . . . making their own 'gadgets.'

Edinburgh pitch for observatory

12.6.86

Two Edinburgh MPs have written to the Education Secretary Mr Kenneth Baker, putting the case for moving the Royal Observatory headquarters, which are to leave Herstmonceaux Castle, Sussex, to the Royal Observatory, Edinburgh.

The three contending astronomical centres where the Sussex-based observatory (still generally, if inaccurately, referred to as the Greenwich Royal Observatory) could move are Edinburgh, Manchester and Cambridge. So far, the leading contender is thought to be Manchester.

Lord James Douglas-Hamilton (C, W Edinburgh) and Mr Alex Fletcher (C, C Edinburgh) tell Mr Baker that their city has been internationally recognised as a centre of astronomical research and education for more than 150 years and has excellent transport links, working closely with several UK universities.

"Since the formation of the Research Council in 1965 the observatory has made an important and growing contribution to the council's programme for support of optical ostronomy and it would be a logical place for future developments in this discipline," they say.

Edinburgh would provide an ideal environment for observatory staff "with varied types of housing, an excellent range of schools and colleges, and all the sporting and cultural attractions of a capital city."

MINES SEARCH ABANDONED

Sussex site of astronomical telescope

From Professor Geoffrey Burbidge, FRS

Sir, Points raised in recent letters concerning the Isaac Newton Telescope (INT) have recently been brought to my attention. As an expatriate British astrophysicist with considerable knowledge and strong views on this matter, perhaps you will allow me to answer some of the questions raised.

Those responsible for building the telescope in Sussex were officials of HM Government who did this on the advice of senior astronomers in the United Kingdom. At the time when the construction of the telescope was under discussion, the climate of opinion was such that it was not thought that the money would be made available unless the telescope were built in Britain. Consequently, the astronomical establishment convinced itself and HM Government that the climatic conditions were reasonably good. Some prominent British scientists, including Professor Lyttleton, disagreed with this view but their opinions were totally disregarded.

The total number of hours during which the INT has been used since it became fully operational is between 600 and 800 hours per year. This is to be compared with 2,100-2,500 hours per year for the large optical telescopes in California, Arizona and Chile. Even in the limited period when the INT can be used, clouds are frequently present, so that some types of astronomical observations are quite impossible. Also, very faint objects cannot be observed at all so that cosmological investigations are largely ruled out.

There is, however, no question but that the astronomers who attempt to use the INT do so on every possible occasion. The figure of 1,900 hours per year mentioned by Mr Lancaster Brown was based on the number of hours of sunshine at South Coast resorts close to Herstmonceux, and it bears no connexion with the number of clear observing hours, though it was used to bolster the case for a site in Sussex. Due to its site alone, therefore, the INT is only 25-30 per cent effective at best, when compared with other large reflecting telescopes operating at good sites.

The majority of the astronomers at the Royal Greenwich Observatory, a large proportion of the younger optical astronomers in the United Kingdom, and the expatriate British optical astronomers who are those with the greatest experience, believe that the INT should be moved as soon as possible to a good site outside the United Kingdom.

The observing conditions in Sussex are so bad that many areas of research cannot be pursued at all, and the telescope cannot properly be used for testing new instrumentation. If new instruments are developed, to be used effectively they have to be taken abroad. Also, it is not a good training facility since nothing creates more disillusion in a young astronomer than finding that the weather is so bad that he can't even start his observing programme.

The main reason why the proposal to move the INT is being softpedalled is not the cost, which does not appear to be unreasonable, but the fear that such a proposal will make it very difficult to get the much larger amount required to build a new northern hemisphere observatory abroad. This is a purely political argument. From a scientific standpoint, the removal of the INT in the very near future to a good site would be a great boost to the morale of the young and eager observers.

A proposal to build a northern hemisphere observatory at a good observing site abroad is being actively studied. Those with extensive experience in optical astronomy would like to do what the Americans have done with great success, and what now the Germans, the French, the Canadians and the European Southern Observatory group are undertaking, namely, the construction of large telescopes of conventional design with modern auxiliary equipment at good sites. They do not want to engage in an interminable debate with those who would like to explore all manner of exotic schemes, like the very large telescope or the array of telescopes mentioned by Professor Seaton. Such schemes would be exceedingly expensive and would probably take as long as the INT (20 years) to complete. And there is a very good chance that the British would then have constructed a second astronomical white elephant.

If optical astronomers in the United Kingdom really want to compete with those in the United States and elsewhere in investigating the universe, the INT must be moved to a good site very quickly, and a northern hemisphere observatory with well-designed conventional telescopes must be constructed and be operating also in the shortest time possible.

Yours faithfully,

GEOFFREY BURBIDGE,
University of California,
San Diego, USA.
March 29.

Astronomer Royal is chosen

By CHRIS MULLINGER, Our Education Correspondent

The appointment of a Cambridge don and member of a world-famous radio telescope team as the next Astronomer Royal for Scotland is to be officially announced next week.

Dr Malcolm Sime Longair (39), born in Dundee, will also take over the associated posts of director of the Royal Observatory, Edinburgh, run by the Science Research Council, and Regius Professor of Astronomy at Edinburgh University.

Professor Vincent Reddish dramatically announced his resignation from the three posts last year. He chose to make the announcement during a visit to the observatory by Mr Neil Macfarlane, Under-Secretary for Education and Science.

The professor hit out at staff shortages at the observatory and interference in its day-to-day running caused by an over-centralised administration of the SRC, which is based in Swindon.

Though Professor Reddish declined to confirm his successor's appointment, he said yesterday: "He faces a pretty tough job. I hope he will not face the same difficulties I faced but I have every reason to believe that they have now been overcome."

Dr Longair is part of the Cavendish radio astronomy laboratory team at Cambridge where his royal appointment is common knowledge. Dr Longair took his BSc at Queen's College, St Andrews, before going to Cambridge to do a PhD in radio astronomy. He became a physics lecturer at Cambridge in 1975.

A fellow of Clare Hall, Cambridge, Dr Longair has been an exchange fellow and visiting professor to astronomical institutes in both Russia and the United States.

When he takes up his Edinburgh posts in October, he will manage three astronomical projects, each the most powerful of their kind in the world. They are the high-speed machines at Edinburgh for measuring astronomical survey photographs, the UK Schmidt telescope camera in Australia, and the world's largest infrared telescope, built on a mountain top in Hawaii.

Dr Longair lives with his wife and two children in the Cambridgeshire parish of Knapwell. When asked at his home last night about his appointment, he said: "It is meant to be confidential until it is published in the 'Edinburgh Gazette'."

3-11-78

Prof. Reddish talks to SRC

An attempt to make the Astronomer Royal for Scotland, Professor Vincent Reddish, think again over his resignation has been made by the Science Research Council.

The secretary of the council, Mr Brian Oakley, met Professor Reddish in Edinburgh yesterday to try to negotiate the problems at the Royal Observatory, which led to the announcement of Prof. Reddish's resignation earlier this week.

A spokeswoman for the SRC said: "The problems are not solved, but some progress has been made."

Prof. Reddish said that it was the start of a three-week period of negotiations with senior officials of the council over the issue of the vacant posts at the observatory. The talks yesterday were good willed and "there seems to be a good deal of agreement over the existence of the problems here," he said.

The professor said: "We need to get these posts filled and we need to be clear that the way in which our research programme is to be carried out is a matter for discussion between the director and his senior staff. The central administration should not interfere either by accident or by design."

Professor Reddish, announcing his resignation as Astronomer Royal for Scotland and director of the Royal Observatory, Edinburgh, criticised the SRC for their "persistent obstruction and interference" in the appointment of senior management posts at the observatory.

On the question of his resignation, which the SRC has asked him to withdraw, Professor Reddish hinted at a change in his position. "I have always maintained that it was unlikely that I would change my mind, because I could not conceive that the changes would be brought about," he said.

But, he suggested, the talks were at an early stage and he would have to see what progress could be made.

Astronomer Royal attacks bureaucrats

By DAVID HEARST

The Science Research Council yesterday asked the Astronomer Royal for Scotland, Professor Vincent Reddish to withdraw his resignation as director of the Royal Observatory, Edinburgh.

But last night, Prof. Reddish was determined to leave his post, after he had criticised the Science Research Council for their "increasing interference" and "persistent obstruction" in the appointment of senior management posts at the observatory.

Prof. Reddish said: "The crucial question is whether our research facilities are going to be run by scientists or by administrators."

The central issue was the observatory director's ability to direct his own work and delegate responsibility to the people he wanted under him.

Prof. Reddish said he had battled with the SRC for more than two years over filling two vacancies among the four senior management posts, all of which he had wanted to be taken by research astronomers. But, he said, the SRC had wanted to appoint an engineer to one.

He said: "The difficulties we have had are not a necessary consequence of the 1 per cent a year cut-back in SRC staff, and I thought the only thing to do was to bring matters to a head by resigning."

Prof. Reddish complained of the "persistently negative" attitude of the SRC's administrators: "We had prolonged arguments lasting for months over the wording of staff recruitment advertisements."

He said it was essential to have four research astronomers in the senior management posts, so that they could take it in turns to direct the two projects overseas, the ROE's UK Schmidt telescope in Australia and the world's largest infra-red telescope on Mount Mauna Kea, in Hawaii.

The alternative, he suggested, would be that the Royal Observatory in Edinburgh would lose control of their projects to an increasingly centralised bureaucracy of the SRC.

A spokeswoman for the SRC said they regretted Prof. Reddish's decision to resign. She said that the ROE had experienced delays in recruitment because candidates who applied for the posts had not been suitable and the people they had wanted did not wish to be considered.

She said that all recruiting was done by a joint committee of the directors of the SRC's five establishments and by administrators, and that they were obliged to stick to certain procedures because they were a public body.

30-10-78

Observatory chief to resign after row

By JAMES JOHNSTON

The Astronomer Royal for Scotland, Professor Vincent Reddish, has resigned as director of the Royal Observatory, Edinburgh, because of "persistent obstruction and interference" by the Science Research Council over filling key posts.

He has held the combined posts of Astronomer Royal, director of the observatory and as Regius Professor of Astronomy at Edinburgh University since 1975.

Prof. Reddish (52) said last night that he had written to the university telling them of his intention to leave the Royal Observatory from next September. He said he felt the three posts should continue to be combined. The university chair is linked with the post of Astronomer Royal.

His resignation as director will inevitably mean he will give up all three posts next year.

Prof. Reddish said that the post of director of the Royal Observatory was a Science Research Council appointment. He said that he had a "fairly long running dispute" with the council headquarters at Swindon over the failure to fill key vacancies in Edinburgh.

There had been "persistent obstruction and interference" by the council in filling key posts with the result that certain positions had been vacant for years. In particular, that of head of the department of instrumentation and technology had been vacant since 1974.

There was "a lot of bureaucracy and it is getting worse," Prof. Reddish said. He disagreed with the council over the type of person who should take over the department of instrumentation and technology. They wanted a professional engineer, but he believed the post should be filled by an astronomer.

Because two of the four senior management posts at the observatory were vacant he had found himself burdened with administrative duties to the detriment of his research work.

"I don't believe I should be a branch manager for the Science Research Council in Edinburgh," Prof. Reddish said.

He said that he would not change his mind about leaving his post at the observatory. Asked what his intentions were, he said that he intended to leave science and go into business on his own. He owns a small estate in the Central Highlands and hopes to develop its tourist potential. He also said there were a number of books which he wanted to write.

Prof. Reddish has been on the staff of the Royal Observatory at Blackford Hill since 1962 and became director three years ago after a series of promotions. He said that it was probably the finest observatory in Western Europe. Apart from their work in Edinburgh, they also man important installations in Australia and Hawaii.

On Mount Mauna Kea, Hawaii, they operate the world's largest infra-red telescope, built at a cost of £2 million by the Science Research Council.

In the Warrumbungles mountain range in New South Wales, Australia, Royal Observatory scientists operate the world's most powerful astronomical camera, which is said to have penetrated farther than 5000 million light years to photograph regions of the universe that existed before Earth was formed.

Prof. Vincent Reddish

21.3.86

Edinburgh may be observatory site

Edinburgh has emerged as the favourite place to re-site the Royal Greenwich Observatory when its present home, Herstmonceux Castle, is sold.

The sale of the fifteenth-century moated castle in East Sussex is expected to fetch about £3.5 million, enough to pay for the move.

Greenwich Observatory was founded by Charles II in 1675 and was housed at Greenwich until it moved to Herstmonceux in 1948. It is the world's oldest observatory.

The Science and Engineering Research Council, which funds the observatory, said the move would lead to significant benefits for the research community. The favourite option is to merge the observatory with the Royal Observatory in Edinburgh. Other possible sites are at Cambridge or Manchester universities.

Although a decision is expected in June, the move will not take place before 1990. Opposition to the decision to sell the castle has come from observatory staff at Greenwich. But the fact that Edinburgh is the favourite choice has been welcomed in the city.

Mr Bennet McInnes, secretary of the Royal Observatory at Blackford Hill, said yesterday: "Naturally, we are very pleased to be seen as the main option and the next few months will be interesting for us."

Mr McInnes said: "We employ 115 permanent staff in Edinburgh and if the two observatories were combined this would double. We would expect about 80 staff to come up from Greenwich, with the remaining posts being filled locally."

LIFESTYLE

by Aileen Ballantyne

The life of the Astronomer Royal for Scotland may appear to be an idyllic one but, since the advent of modern technology, gazing at the stars is not what it used to be

Computerising a pathway to the stars

BY THE END of the year, we should know whether or not the universe will eventually destroy itself. This prophesy does not come from NASA Space Research or the MIT. It comes, with quiet confidence, from a small observatory, next door to a leafy Edinburgh suburb.

Man's final fate is only one of the many mysteries that form part of the everyday life of Professor Vincent Reddish, Astronomer Royal for Scotland, and director of the Royal Observatory on Edinburgh's Blackford Hill.

The universe, he explains, was created by a gigantic explosion. Now, a team of astronomers at the Royal Observatory have succeeded in penetrating far enough into the depths of space to determine whether or not that original explosion was powerful enough to prevent the universe from finally wiping itself out. Professor Reddish explains it as much the same as a rocket being fired into space. If the impetus behind it is strong enough it will stay there — if not it will eventually fall to the ground — with catastrophic consequences. But, he added reassuringly, the earth is already four and a half thousand million years old and is probably only half way through its existence.

Although he was born and brought up in Manchester, Professor Reddish sees himself as an adopted Scot. He takes great pleasure in describing the processes which brought the Royal Observatory — and Scotland — to the forefront of astronomy, from the development of radio and radar during the last war and onwards. Now, the ease of jet travel has made it possible for the observatory to build equipment in Hawaii and Australia.

"It's like a fairy story — a decade ago we were struggling in a cloudy climate, unable to do very much except explore our own galaxies. Now here we are with the most powerful astronomical camera in the world, and the only machine in the world which is capable of extracting information from it."

Professor Reddish may spend much of his time grappling with problems on a scale most of us have difficulty even in contemplating, but he finds no frustration in seeking after the eternally unanswerable. "Every generation thinks they have the final answer," he said, "but I don't believe there is such a thing. There's no end to the subject, it becomes more amazing and more mysterious the more we find out."

For someone who spends so much of his time dealing with imponderables, Vincent Reddish is an extremely practical man. This is partly due, no doubt, to the fact that before turning to astronomy he worked in a bank and in a brewery, and was also in the Navy for three years, having left school at 15 with the equivalent of O grade.

"Even when I'm lying under a car draining out the oil, I'm often thinking about the processes by which stars form."

His passion for astronomy was not generated by star-gazing at sea, however, but at Wigan Technical College. He had a slight interest in the subject, and went into the library there for a book on it.

"The librarian was delighted that at last he had found someone else who shared his main interest. There were about two books on the subject when I went — by the time I left he had filled the shelves with astronomy books."

This was followed by a degree in physics at London University, then a post-graduate degree in astronomy — mainly, he said, because he was unable to get a job elsewhere and was married by that time.

The Astronomer Royal for Scotland has a habit of dispelling popular illusions about his subject. Visions of a life spent contemplating the galaxies through a telescope are quickly shattered. "Of course," he said, "we don't look through a telescope at all now — everything in the end goes into computer data."

The actual processes of research in astronomy bear little resemblance to their romantic image. Professor Reddish spends several weeks of every year in Hawaii but, he points out, he sees very little of the palm trees. "You're working 14,000 ft. up an extinct volcano. It's difficult to breathe at that altitude, and it's really very hard work in an unpleasant environment — by the time you get down to sea level again you're too tired to bother with sightseeing."

The discomfort of working on top of extinct volcanoes may not present a problem to this man; but the one insurmountable frustration in the life of the Astronomer Royal for Scotland lies in the "prolonged and inefficient procedures" of a centralised administration in the South of England.

The observatory, he explained, was funded by the Science Research Council, based in the South of England. All job appointments have to go through them — and their policy is to fill all vacancies from within the ranks of the SRC.

"We have difficulty in carrying out substantial projects simply because of staff shortages; sometimes jobs can be lying vacant for the best part of a year."

He takes the role of an adopted Scot, with the welfare of Scotland's astronomy in his hands, very seriously indeed. In fact, in coming to Edinburgh, he almost felt he had found his personal destiny.

"I came to Edinburgh in 1954, but I've always felt I belonged here. When I arrived, I came up the steps of Waverley station at six o'clock in the morning and immediately felt very attached to the place — I felt I had come home."

Professor Reddish gets away from the stresses of excessive bureaucracy by returning to the practical side of his nature — by rebuilding a car engine perhaps or building an extension to his house. He describes himself as a "compulsive do-it-yourselfer" who keeps trying to get out of the bad habit. But although he may not have much time for his own research between lecturing, directing the observatory and supervising post-graduate students, his mind is never far from the imponderables. "Even while I'm lying under a car draining out the oil," he said, "I'm often thinking about the processes by which stars form."

For all that, he certainly could not be accused of "having his head in the stars" all the time. "I'm not a philosopher or a reader of science fiction," he said. "the facts of life are quite strange enough for me."

To Professor Reddish, the most complex machinery, for all its fascination and power looks "extremely simple and stupid compared with living matter." He sees himself as a detective looking for clues, an explorer with infinite horizons. The discovery of an unknown galaxy to an atronomer is "akin to Cook's feeling when he discovered Australia." And like an explorer, half the excitement, for him, lies in telling the world of his findings.

"The fact that we never can know the secrets of life does nothing to abate his curiosity: "I believe the universe is constructed in such a way that it prevents us from finding out its purpose. If we knew the reasons for its existence we would destroy ourselves."

There may be aspects of his job he dislikes, but Professor Vincent Reddish has no need to "get away" from the basis of his research. Whether he is sailing, or hill-walking and bird-watching in the Highlands on holiday, or just "finding out how things work," he is never far from his basic concern — the universe we live in and its mysteries. Unlike most of us, even his day-to-day work involves the most fundamental interest of mankind — the evolution and future of life itself.

Professor Vincent Reddish, Astronomer Royal for Scotland

Vote clears way for observatory

BY DAVID APPLETON

One of the last obstacles to plans to move the Royal Greenwich Observatory to Edinburgh and create a centre of Britsih astonomy was swept away yesterday when Edinburgh District Council agreed in principle to the sale of land to expand the Royal Observatory at Blackford Hill.

The Science and Engineering Research Council wants to move the Royal Greenwich Observatory from its home at Herstmonceux Castle, in Sussex, and has indicated that the preferred location is Edinburgh. Other possible sites are at Cambridge or Manchester universities.

The Observatory has already secured planning permission in principle for a development at the Blackford Hill site, but had not been able to secure the agreement of the district council to sell it the land, which is part of the Green Belt.

Now the Observatory has trimmed its estimated requirement from 3.5 acres to one acre, says this would be sufficient for the proposed expansion.

The council agreed unanimously to accept a recommendation from its department of estates that it make the land available for sale subject to an early decision being made to relocate the Royal Greenwich Observatory in Edinburgh.

It was told that if the development went ahead the number of staff and students at the Observatory would increase by about 100, to 250 by 1988.

The district council also agreed, by 35 votes to 15, to introduce a ban on visits to the city by circuses which use animal acts, by using it powers over the granting of public entertainment licences.

The council also agreed to appoint chairmen to committees. The former group leader, Councillor Alex Wood, was replaced as chairman of the policy and resources committee by the new group leader, Councillor Mark Lazarowicz. Other appointments were: Councillor Paolo Vestri (finance), Councillor Lesley Hinds (general purposes), Councillor Robert Cairns (planning) and Councillor James Henderson (recreation).

16.5.86

26.2.86

Astronomer Royal among winners of new award

The Astronomer Royal for Scotland, Prof Malcolm Sim Longair, is one of five winners of the newly-established Brittanica Awards which recognise "exceptional excellence in the dissemination of learning for the benefit of mankind."

Also honoured are: two Americans, Senator Daniel Moynihan and Dr Lewis Thomas, the physician-writer; Mr John Tuzo Wilson, the Canadian geophysicist; and Dame Leonie Judith Kramer, the Australian author.

Mr Robert Gwinn, chairman of *Encyclopaedia Brittanica*, said: "Many prizes exist for the advancement of knowledge — for breakthroughs in particular sciences, for innovations in technology, for creative excellence in the arts, for contributions to learning.

"But that is not the achievements that the Brittanica Awards celebrate. They are given for acknowledged skill in the communication of knowledge and a passion for the dissemination of learning."

Up to five Brittanica Awards will be made each year, with winners receiving a gold medal and $15,000.

Prof Longair (45) was educated at Morgan Academy, Dundee, and then at Dundee, St Andrews and Cambridge

SKY IN SEPTEMBER

30.8.82

NEW UK

Telescope in Hawaii

PLANS have been announced for a new telescope, funded by the Science and Engineering Research Council in partnership with the Netherlands Organisation for the Advancement of Pure Science, to be built near the summit of the Mauna Kea mountain in Hawaii. The instrument will have an aperture of 15 metres and is being designed to collect and measure millimetre radiation, which has wavelengths intermediate between those of infra-red and radio waves.

There is already a UK infra-red telescope (UKIRT) being operated on Mauna Kea by scientists and engineers from the Royal Observatory, Edinburgh, and the 14,000ft elevation of the extinct volcano is considered ideal for the study of infra-red and millimetre waves which suffer absorption in the earth's atmosphere so that sea-level telescopes can barely detect them. Subject to local planning approval, construction of the new £9 million facility may begin next spring with completion in 1986, when its operation will be linked with that of UKIRT at a combined annual cost of £2 million and with a resident staff of about 50 people.

The millimetre-wave telescope will enable astronomers, physicists and chemists to further the study of the processes taking place in the cool clouds of gas and dust between the stars of our own and other galaxies. Here complex molecules, some of them perhaps the precursors of life, are formed, and here also are the birthplaces of new stars and planetary systems.

Comet recedes

SKY IN OCTOBER

ROE a

THE AWARD of a Scottish Museum of the Year honour to the visitor centre of the Royal Observatory, Edinburgh, recognises the great improvements made there in recent years to bring astronomy, and in particular the developing role of the Royal Observatory, to the public at large.

The observatory's responsibilities have grown in the past decade to encompass the operation for the Science and Engineering Research Council of three major national facilities, each the most powerful of its type in the world: the 1.2 metre aperture UK Schmidt telescope in Australia; the 3.8 metre UK Infra-red telescope in Hawaii; and the COSMOS high-speed photograph-measuring machine.

These receive due prominence in the displays at the new centre, but the other contributions of the ROE are not neglected. Also on display, for example, are results from the first European astronomical satellite, TD1A, with which the ROE was closely involved.

In the main gallery of the centre is a magnificent selection of early scientific instruments and telescopes, including several donated by Arthur Frank. On display in the observatory's east tower is the 36-inch telescope, now the largest (equal) optical telescope still functioning in the UK, while a gallery in the west tower provides superb views of a 0.4-metre Schmidt telescope. I was one of the last to use this telescope when I photographed Comet Kobayashi-Berger-Milon in 1975.

Admission to the centre is 50p for adults and 25p for children and OAPs, with special rates for parties and out-of-hour visits. Opening hours are 10.00 to 16.00 on weekdays and 12.00 to 17.00 on Saturdays and Sundays. For further information contact The Visitor Centre, The Royal Observatory, Blackford Hill, Edinburgh EH9 3HJ (tel. 667 3321).

HOME NEWS

Plan to move observatory ill-starred

By WILLIAM PAUL

A proposal to transfer the Royal Greenwich Observatory to Edinburgh to make the city the headquarters of British astronomy is being seriously threatened by a groundswell of opposition among professional astronomers.

The Royal Observatory on Blackford Hill in Edinburgh has been identified as the first-choice site if the present location of the RGO at Herstmonceux Castle, East Sussex, were to be closed down as recommended by the Science and Engineering Research Council. Cambridge and Manchester universities, in that order, are regarded as other options.

The SERC has already agreed in principle that the RGO, Britain's oldest observatory, should be moved from the fifteenth-century moated castle to save money and will meet on Wednesday to decide where it should go in the face of a strong campaign to maintain the *status quo*.

A spokesman for the SERC said yesterday that while Edinburgh remained "top of the list" there had been a lot of public pressure to keep the RGO in Sussex and that might have to be taken into account.

A questionnaire distributed to about 2,000 members of the Royal Astronomical Society has disclosed that 65 per cent are against any move from Herstmonceux. Also that 42 per cent favour Cambridge if a move is necessary, with the remainder equally divided between Edinburgh and Manchester.

The 190 staff at the RGO are also said to have voted to oppose any move but most qualified that by saying they would be prepared to move to Cambridge. Only 50 per cent would want to move as far as Manchester, and that is reduced to 40 per cent in the case of Edinburgh.

Mr Nigel Henbest, astronomy consultant to *New Scientist*, said the issue on Wednesday was far from being a clear-cut choice of where the RGO was to go in spite of the earlier decision in principle.

He said there had been a tremendous backlash from the astronomical community since the announcement in March and that might influence the SERC into reconsidering the whole idea. Edinburgh, he said, was viewed as too "remote" by many people involved in optical astronomy.

Recently the broadcaster and writer Patrick Moore said: "Herstmonceux has the overwhelming support of the scientific and non-scientific world who are all against a move.

"To move the RGO from Herstmonceux will destroy its character. If we allow it to be wiped out by a vandalistic stroke of a bureaucratic pen history is not going to be happy with us."

Edinburgh District Council has agreed to sell one acre of land on Blackford Hill to the Royal Observatory to cope with expansion plans if the RGO is transferred. There are already more than 100 staff based in the city and about 80 would be expected to come north if the plans go ahead.

Councillor Richard Kerley, chairman of the council's economic development committee, said it was absolute nonsense to claim that Edinburgh was not suitably equipped to cope with expansion of observatory facilities. He said the council was contacting MPs and peers to ensure that Edinburgh's case was put at the highest level.

Professor Malcolm Longair, Astronomer Royal for Scotland, said a great deal of opposition to moving the RGO was based on "misunderstandings and misrepresentations of what the whole business w about."

"I believe people are no looking at the real fundamental issues but at the superficial issues instead. The real fact is that there is not enough money to support science," he said.

The SERC hope to sell the Herstmonceux Castle for £3.5 million to finance the transfer of the RGO and to save money by concentrating resources on a single site, compared to the two existing Royal observatories.

The RGO was founded by Charles II in 1675 and was housed at Greenwich on the banks of the River Thames until it moved out to Sussex in 1948, retaining its original title.

UK ASTRONOMY

Shakeup for Royal Observatories

London

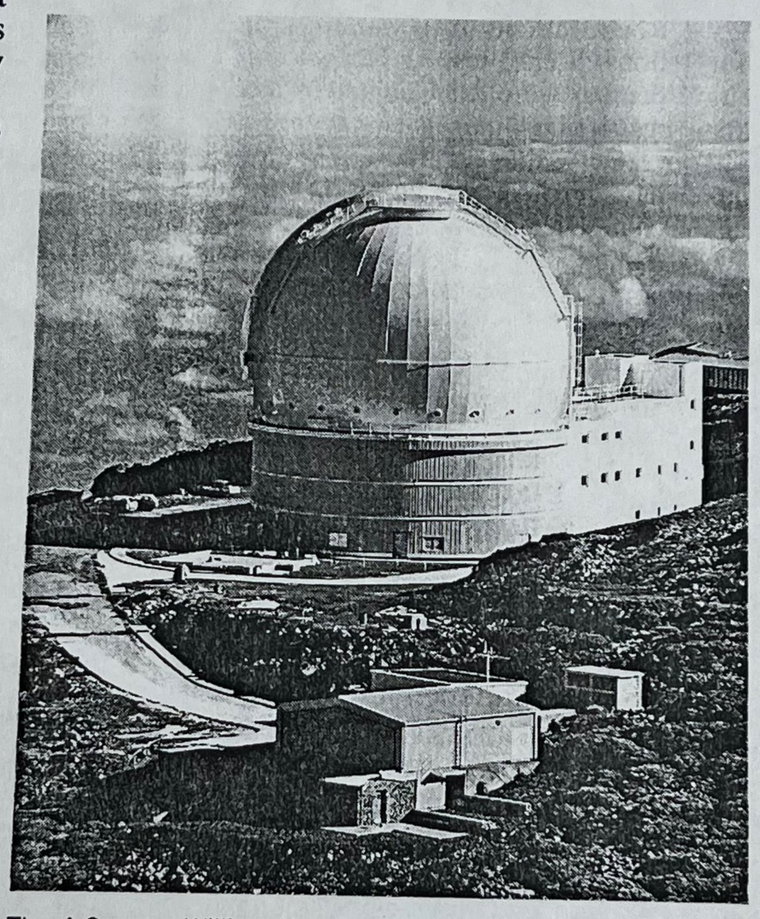
A SCIENCE and Engineering Research Council (SERC) plan to bring Britain's two separate Royal Observatories under the control of a single, powerful director is dividing UK astronomers. Many staff at the Royal Greenwich Observatory (RGO) in Cambridge and the Royal Observatory, Edinburgh (ROE) believe the new organization will destroy the institutes' traditional autonomy, bringing them more strongly under the influence of SERC's headquarters at Swindon. Given the frequently aired misgivings of SERC's chairman Sir Mark Richmond about the high proportion of the council's budget spent on 'big science', they fear the worst.

Some university astronomers share their colleagues' concern, arguing that the loss of the scientific leadership traditionally given by the two Royal Observatory directors could undermine morale, seriously damaging British astronomy. But others believe changes are long overdue, and say that the new central control could lead to better access to Britain's telescopes for university astronomers. The debate will intensify over the next few months, as SERC searches among its own employees for a suitable candidate for the new job.

The Royal Observatories predate the modern organization of UK science, and were once synonymous with British astronomy. (RGO dates from the seventeenth century, ROE from the eighteenth.) But the growth of a university-based British astronomical community, and the observatories' takeover by SERC in the 1960s, forced changes. Over the past decade, SERC's policy has been to reduce the observatories' status as premier research centres (the number of staff employed at the two sites has fallen from 341 to 245 since 1985). Today, their main role is to run large telescopes for use by the wider UK astronomical community. For RGO, this means running Britain's optical telescopes, at La Palma, in the Canary Islands, while ROE is responsible for a series of infrared telescopes in Hawaii.

But according to SERC's deputy chairman, Tony Hughes, the separation between the two observatories' roles is now inappropriate. The next major project in British astronomy — the Gemini collaboration with the United States and Canada (see *Nature* **353**, 688; 1991) — is to build two 8-metre telescopes that will observe in both the visible and infrared spectra, cutting across the traditional demarcation between the two Royal Observatories. And some astronomers say privately that the natural spirit of competition between the two Royal Observatories has not always served British astronomy well.

Some Royal Observatory astronomers view SERC's plans in a much more sinister light, however. As SERC employees, they are unwilling to speak publicly, fearing retribution. But amid dark mutterings about SERC's "management by terror", the fear is that the the new director may not fight strongly for the observatories' interests against a SERC leadership seen by many astronomers as hostile to the subject.



The 4.2-metre William Herschel Telescope at La Palma, in the Canary Islands run by RGO.

SERC wants to give the job to one of its existing employees. And as the new Royal Observatory head's job is a managerial position, an administrator, rather than a respected astronomer, is thought likely to get the job (although Hughes stresses that no decision has yet been made). The directors of RGO and ROE "have provided very much of a buffer between the bureaucracy in Swindon and the astronomical community," says one RGO astronomer. "Now that buffer is being removed." RGO staff also fear that their current director, Alec Boksenberg (widely respected for his role in developing the Hubble Space Telescope's Faint Object Camera), may have no place in the new set-up. For its part, ROE has had no permanent director since Malcolm Longair left for the University of Cambridge in 1990, and is being run temporarily by Paul Murdin, formerly Boksenberg's deputy at RGO.

Longair agrees with SERC that the work of the two observatories needs pulling together. But he believes that SERC should be careful to appoint a director who will have the support of the staff. There is a problem with morale, he says, and "if these people get discouraged, they may go elsewhere".

Other university astronomers are worried about the possibility of an administrator, rather than a scientist, having such a powerful position in British astronomy. "That's not the way to run any scientific enterprise," contends Sir Martin Rees, from the Institute of Astronomy at Cambridge, pointing out that top-class laboratories such as CERN and Fermilab, though equally complex to administer, are headed by internationally respected scientists. He is concerned that the downgrading of the RGO and ROE directors' posts will erode the scientific leadership at the two observatories.

But university astronomers are divided over the issue. If the observatories are to co-operate more closely, "what they need is a manager," says Ken Pounds, from the University of Leicester, who is president of the Royal Astronomical Society. The best solution would be to find an astronomer who is also a good manager. But "are there such people?" he asks. Pounds (himself an X-ray astronomer, so not a user of the Royal Observatories' telescopes) views the observatories' present organization as an historical accident, which does not necessarily ensure the best access to the island telescopes for university astronomers. "Remember that [SERC's] establishments should be there to help the universities carry out research."

The Astronomer Royal, Arnold Wolfendale from the University of Durham, says he fully supports the SERC plan — he heads the council's Astronomy and Planetary Science Board. He even believes that the new organization could encourage SERC to spend more on astronomy, if UK astronomers now begin to "pull in the same direction". Given the depth of resentment among many Royal Observatory staff, however, that may be a tall order.

Peter Aldhous

CORRECTION

IN the News story "'IQ pills' land in trouble" (*Nature* **355**, 285; 23 January 1992), the authors of the article in *The Lancet* should have been given as David Benton and Gwilym Roberts.

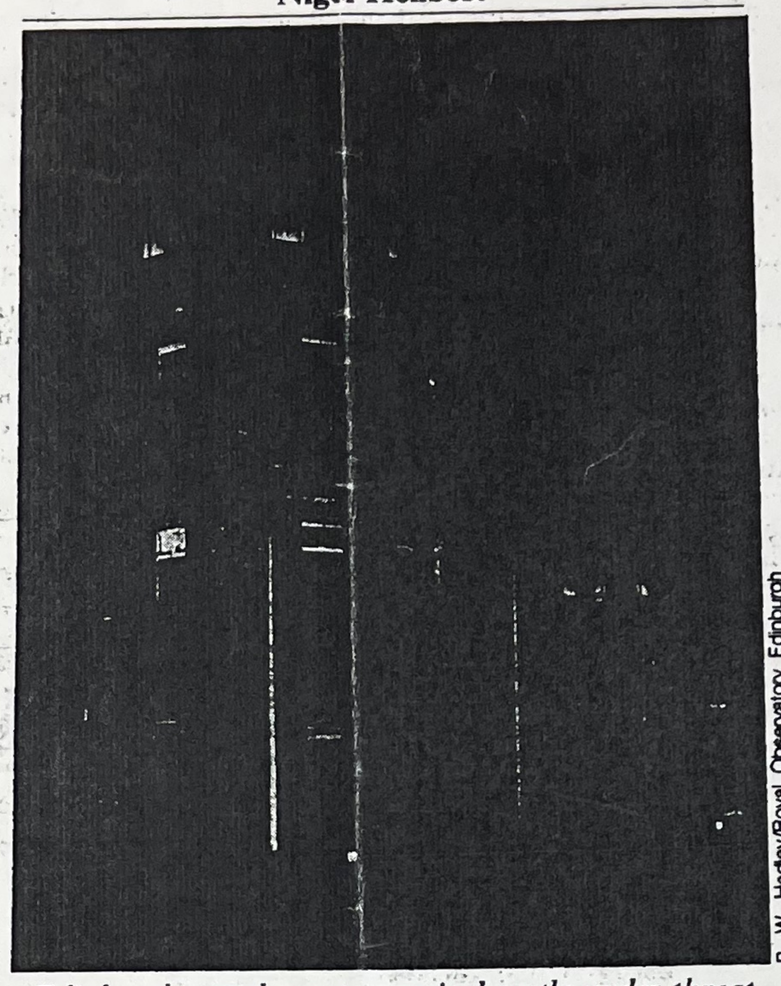
Now Edinburgh observatory faces bleak future

Nigel Henbest

THE IMMINENT move of the Royal Greenwich Observatory to Cambridge may mean the end of the Royal Observatory at Edinburgh as a major centre of research in astronomy.

At the moment, the Edinburgh observatory is in charge of two British telescopes abroad, the UK Infrared Telescope on Hawaii and the UK Schmidt Telescope in Australia. Next year, it will also take on the Maxwell Telescope now being completed on Hawaii. The Royal Greenwich Observatory (RGO) is responsible for the telescopes on La Palma. Both observatories are establishments of the Science and Engineering Research Council (SERC).

Two years ago, Malcolm Longair, the Astronomer Royal for Scotland and director of the Edinburgh observatory, first suggested to the SERC that a merger of the two observatories would be cheaper and more flexible to run. Last month, the council rejected this idea, and chose to move the observatory to Cambridge (*New Scientist*, 26 June, p 32). But the apparent tidiness of Longair's case has taken on a life of its own among the administrators at the SERC. It now threatens the future of Longair's own observatory.



B. W. Hadley/Royal Observatory Edinburgh

Edinburgh: another astronomical castle under threat

No one believes that the SERC will decide to move the Edinburgh observatory in the same way it intends to move the Royal Greenwich. Edinburgh's astronomy centre is regarded as part of Scotland's scientific heritage and it is intimately linked with the University of Edinburgh, which would want to retain the observatory. In addition, the research council does not own the Edinburgh site. It leases it from Edinburgh City Council, so the SERC could not finance a move from the sale of the observatory site, as it intends to do with the Greenwich observatory's site at Herstmonceux Castle.

And in view of the reaction from scientists and disruption to scientific programmes, that the move of the Greenwich observatory has caused, the SERC is unlikely to want to go through the whole process again soon. It has no official plans to discuss the future of the Edinburgh observatory.

In the long term, the Edinburgh observatory is likely to "ooze down" to Cambridge, say many English astronomers. Some members of the SERC are already discussing the possibility of moving some of Edinburgh's programmes to Cambridge. If enough of the major projects move south, the research council could relinquish the Edinburgh observatory as an SERC establishment, and fund it instead as part of the University of Edinburgh. In this way, it would effectively amalgamate the roles of the two observatories at Cambridge, without physically moving the Edinburgh observatory.

It looks as though Edinburgh will lose one of its responsibilities in the next year. The SERC's astronomy boards have recommended that the UK Schmidt Telescope, should become a partnership between Britain and Australia, administered by the Anglo-Australian Observatory, which runs the large Anglo-Australian Telescope, which stands on the same site in New South Wales.

Some astronomers also see a case for administering the Maxwell Telescope from Cambridge. It was built by the staff of the SERC's Rutherford Appleton Laboratory and Cambridge's Cavendish Laboratory. With a big build-up in support for ground-based astronomy in Cambridge, astronomers wonder at the logic of taking the administration to Edinburgh.

Malcolm Longair is cautious about discussing the fate of his observatory. He says: "We don't yet know the full implications of the SERC's decision. We must wait and see what happens after the Greenwich observatory is moved. On the longer time scale, the question of the observatories will undoubtedly recur. But for the moment, it is not clear what the SERC policy is: is it to put more activity into the universities . . . or is it the first stage of something else?"

Meanwhile, the SERC has—for the first time—published its estimate of the cost of the move to Cambridge: £6 million. This is supposed to cover the cost of the building, of the move itself, and various staff costs, such as redundancy payments and extra rent allowances.

This is considerably more than could be raised by the sale of the Castle and grounds—unofficially estimated at £3½m—and the council now sees the difference being made up by savings in operating the new observatory in Cambridge. Staff at Herstmonceux are worried, however, that the only way the SERC can realise such large savings is by cutting jobs substantially. □

Red-shift record excites astronomers

A NEW candidate for the title "most distant object known" has been identified by a team of British and American astronomers. Advances in the technology of scanning the skies for distant quasars hold out the prospect of many more such finds.

Researchers from the universities of Cambridge, Pittsburgh, and from Caltech in California reported last week in *Nature* that a quasar known as 1208+1011 has a red shift of 3·8. This shift in features in the spectra of galaxies and quasars is interpreted as being the result of the expansion of the Universe. According to the standard model of cosmology, the distance to remote astronomical objects is proportional to their red shifts. The highest red shift previously known, for the quasar PKS2000-330, is 3·78.

The astronomers are excited not only because they have narrowly beaten this record, but also because their current survey of the skies has found four other quasars with red shifts bigger than 3·5.

The trick has been achieved by using photographic plates which are sensitive at longer wavelengths than those used in previous surveys of quasars. The standard plates have a cutoff at about 520 nanometers (nm), and do not give a good response to longer wavelengths. The feature astronomers use to identify large red shifts is the Lyman-alpha feature of hydrogen, which shows up at about 520 nm for a red shift of 3·3. So the standard plates do not give a good response to the most important feature at greater red shifts. The plates used in the new survey, called IIIa-F, have a good response up to 680 nm, corresponding to Lyman-alpha red shifts of up to 4·6.

Until the new study, carried out with the UK Schmidt Telescope in Australia, only four other quasars with red shifts exceeding 3·5 have been found anywhere in the sky.

The new study has looked only at part of the sky, and the astronomers are confident that many more quasars with red shifts bigger than 3·5, and perhaps bigger than 4, will soon be identified.

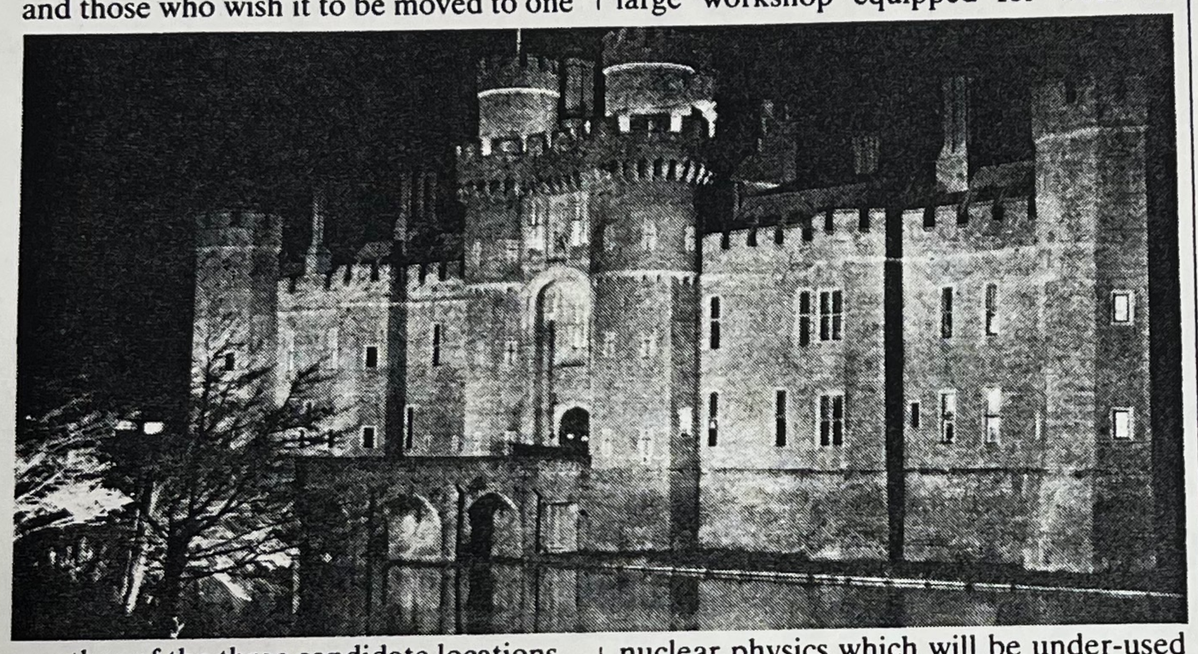
The actual distance to such a remote object is a nebulous notion, since the light by which we see the quasar was emitted when the Universe was a tenth as old as it is today. This means that the objects now being uncovered were active when the Universe was less than 10 per cent of its present age. □

1-5-86

British astronomy

Observatory move stirs passions

THE plan to move the Royal Greenwich Observatory (RGO) from its present location in Sussex to somewhere else in Britain has evoked mixed passions among British astronomers. If possible, feelings run even more strongly than in the high-energy physics community when British membership of the European Organisation for Nuclear Physics (CERN) was being examined more than a year ago. But British astronomers are divided between those who think RGO should stay where it is and those who wish it to be moved to one or other of the three candidate locations.



The decision that RGO should be moved was taken by the Science and Engineering Research Council (SERC) in March (see *Nature*, **320**, 297; 1986). SERC is to decide at its meeting in June whether RGO should, while retaining its identity, go the Universities of Cambridge or Manchester or, alternatively, unite with the Royal Observatory, Edinburgh (ROE), on its Blackford Hill site.

SERC's announcement of these developments followed an invitation to seven British universities to offer hospitality to a transplanted RGO. Dr E.J.W. Mitchell, SERC's chairman, explained in March that the decision to move RGO had arisen in part from disappointment with the strength of its present relationship with university astronomers. Of the three future locations for RGO, the council said that Edinburgh was the most favoured.

Some of the fiercest reactions to this development have come from universities not now on the short-list of candidate locations. The University of Oxford, one of those invited to provide a site for RGO earlier in the year, is up in arms at what local astronomers consider to have been a change in the rules of SERC's competition when the finishing post was in sight. In a strongly worded protest to SERC, Oxford astronomers have complained that, when they had identified a building capable of providing the 2,000 m^2 of floor space required by SERC, they were told that the requirement of floor space had doubled.

According to a SERC spokesman this week, there is some confusion on this point. He acknowledged that there had been a change of specification, but said that the present requirement for 4,000 m^2 of space was intended to be a gross figure; usable floor space would be three-quarters of the total. This does not fully meet the Oxford contention that the hospitality the university offers includes a large workshop equipped for work in nuclear physics which will be under-used when SERC ceases to support the tandem electrostatic generator on the site.

The lobbying of the two universities on the short-list is, for Britain, unusually direct. The University of Manchester makes a great deal of its offer of rent-free accommodation, on the site of the Christie Hospital, for RGO. At Cambridge, on the other hand, it seems to be accepted that SERC would have to meet the cost of a building to house RGO, presumably out of the proceeds of the sale of the Herstmonceux buildings: SERC has said that the move will have to be self-financing. In the nature of things, the sale of the castle is at the speculative end of the real-estate spectrum.

Intellectually, Cambridge offers propinquity to the Institute of Astronomy and the Cavendish Laboratory, with RGO to be sited in the grounds of the university observatory adjoining the institute. Manchester, by contrast, emphasizes its own close academic links with other universities and polytechnics in the Midlands and northern England. In a letter addressed to all fellows of the Royal Astronomical Society, the Astronomer-Royal, Sir Francis Graham Smith, who is also director of the Jodrell Bank Observatory of the University of Manchester, argues first against the preferred move to Edinburgh on the grounds of geography, the tenuous academic link between the Edinburgh observatory and the university and by saying that the continued separate existence of RGO and the Edinburgh observatory offers the best scientific value. He then goes on, after declaring his interest, to put the case for Manchester on the grounds of geography and facilities.

Astronomers elsewhere appear mostly to wish that a decision could be avoided. All speak highly of the work done by the two public observatories in commissioning new telescopes on Hawaii (ROE) and La Palma (RGO); there is particularly high praise for the support offered by RGO to academic astronomers using the 2.5-m Isaac Newton telescope at La Palma.

This argument is lent support by the lack so far of an estimate of the savings that may result from the proposed move, which SERC says is being made on scientific grounds within the constraint that the cost of the move should be supported by the sale of assets. The staff at RGO has already shrunk from its peak of about 240 to a present complement of 190. By the time planned for the move in 1990, it is intended that the observatory's staff should consist of about 100 people in Britain with a further 30 at La Palma.

The opinions of the RGO staff are also divided, but favour Cambridge. A survey carried out last month (to which 55 per cent of the staff responded) showed that 80 per cent would be prepared to move somewhere, of whom 90 per cent gave Cambridge as their preference. Asked to identify the sites to which they would not move, only two per cent of the staff came out against Cambridge. In response to the same question, 60 per cent said they would not move to Edinburgh and 50 per cent dug in their heels against Manchester.

Meanwhile, a regional political lobby is forming to preserve RGO at its present site. The East Sussex County Council and the North Weald District Council, both of which have an interest in the tourists attracted by Herstmonceux, are seeking to influence official opinion, as are local members of parliament.

There is no precedent for political forces such as these influencing the autonomous decisions of research councils, yet SERC will need strong nerves if it is to stick to its timetable of a decision next month. Matters have not been much simplified by reports that Dr Harry Atkinson, the senior official of SERC in charge of astronomy spending (and also chairman of the European Space Research Organisation) had given the members of one committee the impression that there were political considerations in the decision not to vacate the Edinburgh site. Dr Atkinson explained on the telephone this week that he meant only that, in his opinion, SERC should pay attention to the regional distribution of its establishments, but even that may be enough for the Sussex lobby to keep the door ajar.

John Maddox

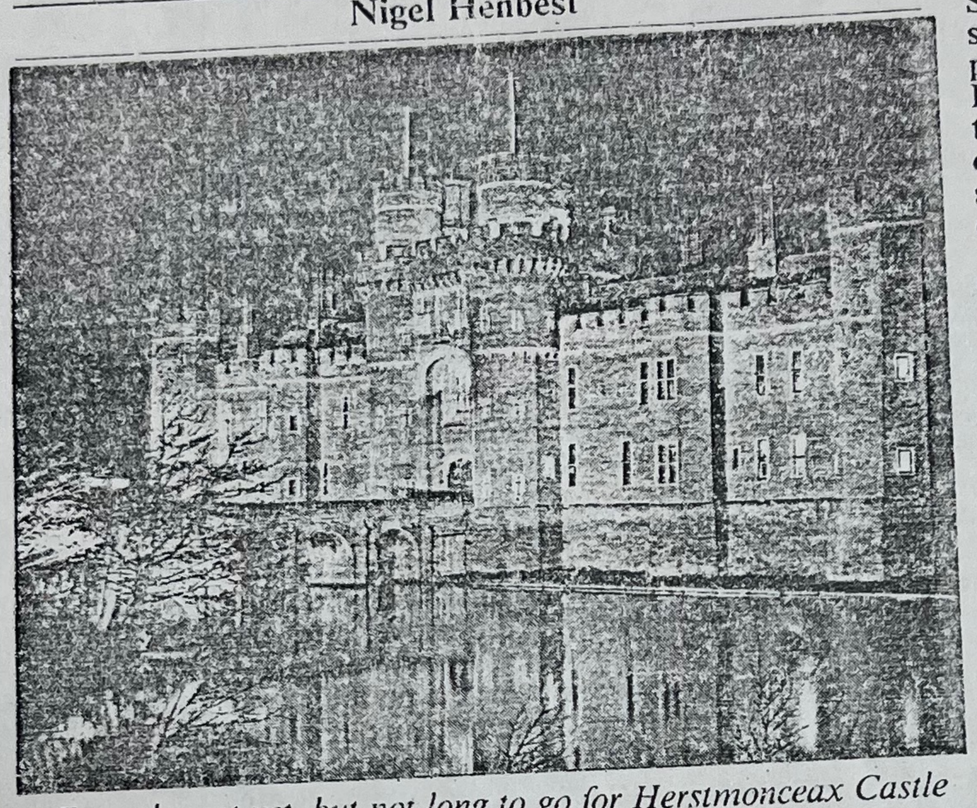
THIS WEEK

Royal observatory faces closure plan

Nigel Henbest

BRITAIN's Science and Engineering Research Council (SERC) meets in two weeks' time to decide the fate of the Royal Greenwich Observatory. The council will receive recommendations that amount to killing off many of the observatory's functions, and moving what is left at the observatory's headquarters in Sussex to Cambridge.

Astronomers both in the observatory and in universities are angry with the advice that the council is receiving. The move from the Herstmonceux Castle in Sussex would cost millions of pounds that would come from the budget for scientific research, they say. In addition, the move would be very badly timed. A move within the next five years (as recommended) could disrupt the observatory's main task of completing the huge William Herschel Telescope on La Palma in the Canaries.



For sale: not yet, but not long to go for Herstmonceax Castle

Astronomers are especially infuriated because the SERC has given no practical reason for the move. A specially appointed panel of the SERC, which recently deliberated the fate of the observatory for eight months, found no scientific, administrative or economic justification for a move (*New Scientist*, 9 January, p 23). The only reason that the SERC will give for the move now is that it will bring "intangible and unquantifiable benefits".

The real reasons for the move seem to be political. In 1983, a committee appointed to look into the government's expenditure recommended that the SERC should sell Herstmonceux Castle. Despite pressure from some "anti-Herstmonceux" astronomers and adminstrators within the SERC, the council decided it would be too expensive and disruptive to move the observatory. A year later, the SERC's panel looking into the staffing of the observatory once again recommended that it should remain at Herstmonceux.

But senior civil servants in the Department of Education and Science, which ultimately funds the observatory, believe that the SERC has a "redundant castle" in Sussex. And with a planned cut in staff, from 240 to 100, excluding those at La Palma, it became more difficult to justify the large site. As a result, the SERC's retiring chairman, Sir John Kingman, set up the most recent review. Once again, the review found no reason for a move.

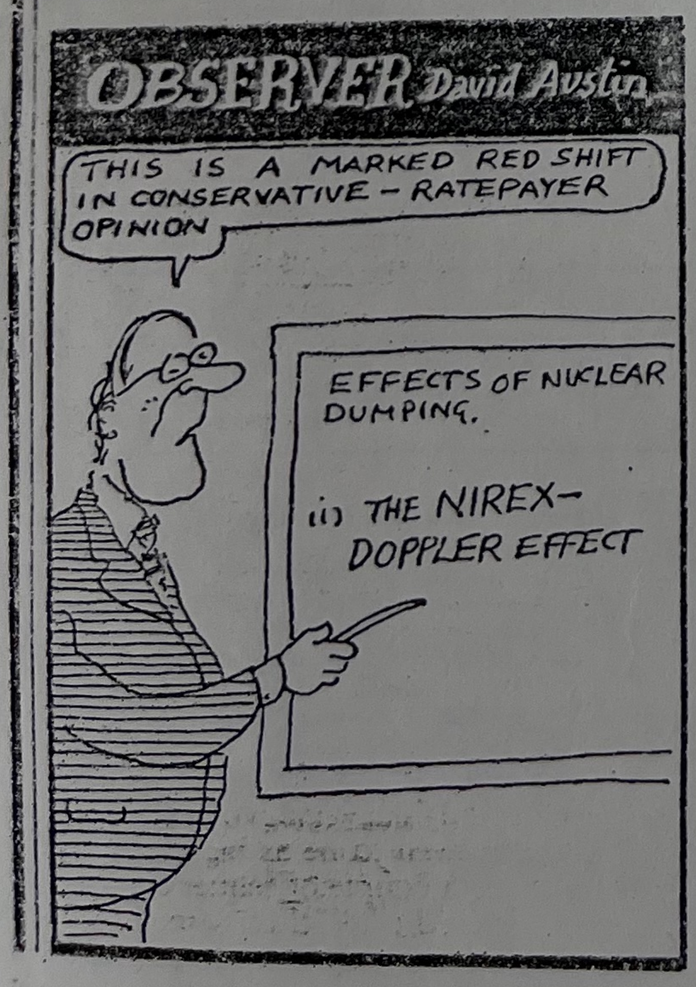
To many people in the SERC and the Department of Education and Science, Herstmonceux Castle is still an embarrassment, and the present chairman of the SERC, Bill Mitchell, would like to see a tidy solution to the recurrent debate. The easiest option is to sell the castle and move the observatory.

Mitchell's advisors think that by putting the observatory on the campus of a university with a large astronomy department, there would be a "synergy" that would benefit both sides.

The SERC has therefore, asked eight British universities to "bid" for the observatory. The short list that will come up at the SERC's decisive meeting this month will include Cambridge, and probably Oxford and University College, London. Cambridge, with a wide base in astronomy, is the front runner. If the observatory moves there, it will form part of one of the world's largest astronomy centres.

The SERC will not move the whole of the observatory's activities, just the administration of La Palma, the astrophysicists and the people who build new instruments. The future of the rest would need to be discussed piecemeal. The SERC is concerned at losing the telescopes sited at Herstmonceux, which might be taken over by Sussex University or by the National Maritime Museum, which runs the Old Royal Observatory at Greenwich, and the satellite laser ranger, which is producing important new results.

The net cost of moving (after allowing for the sale of Herstmonceux Castle and grounds) would be £5 million. Many astronomers feel this money should be spent on research: it would pay for another world-class optical or radio telescope. □



Sellafield stays open despite new leaks

LAST WEEK, the British government flatly refused to shut its nuclear reprocessing plant at Sellafield. But this has failed to end British Nuclear Fuels' (BNF's) current run of headaches. Last Saturday, another leak of radioactive material occurred at the plant, the fourth in two months.

This time, however, Sellafield's Magnox reprocessing line, the focus of the current safety audit that the government has ordered to be carried out, was not implicated. The latest leak took place in the building where fuel is made for the UK Atomic Energy Authority's Prototype Fast Reactor, sited at Dounreay in Scotland.

Initial tests showed that five workers, who were all wearing respirators at the time of the leak, were contaminated. Full-scale biological tests on the five are now being undertaken. The results will be known in six weeks' time. A spokesman for BNF denied this week that one of the workers received several times his annual permitted dose in the incident. A press report suggested that the dose was as much as 24 times the permitted limit. "Our available information does not support this claim: we won't be sure of the uptake of radioactive material [principally plutonium], until the results of the present biological tests are known", the spokesman said.

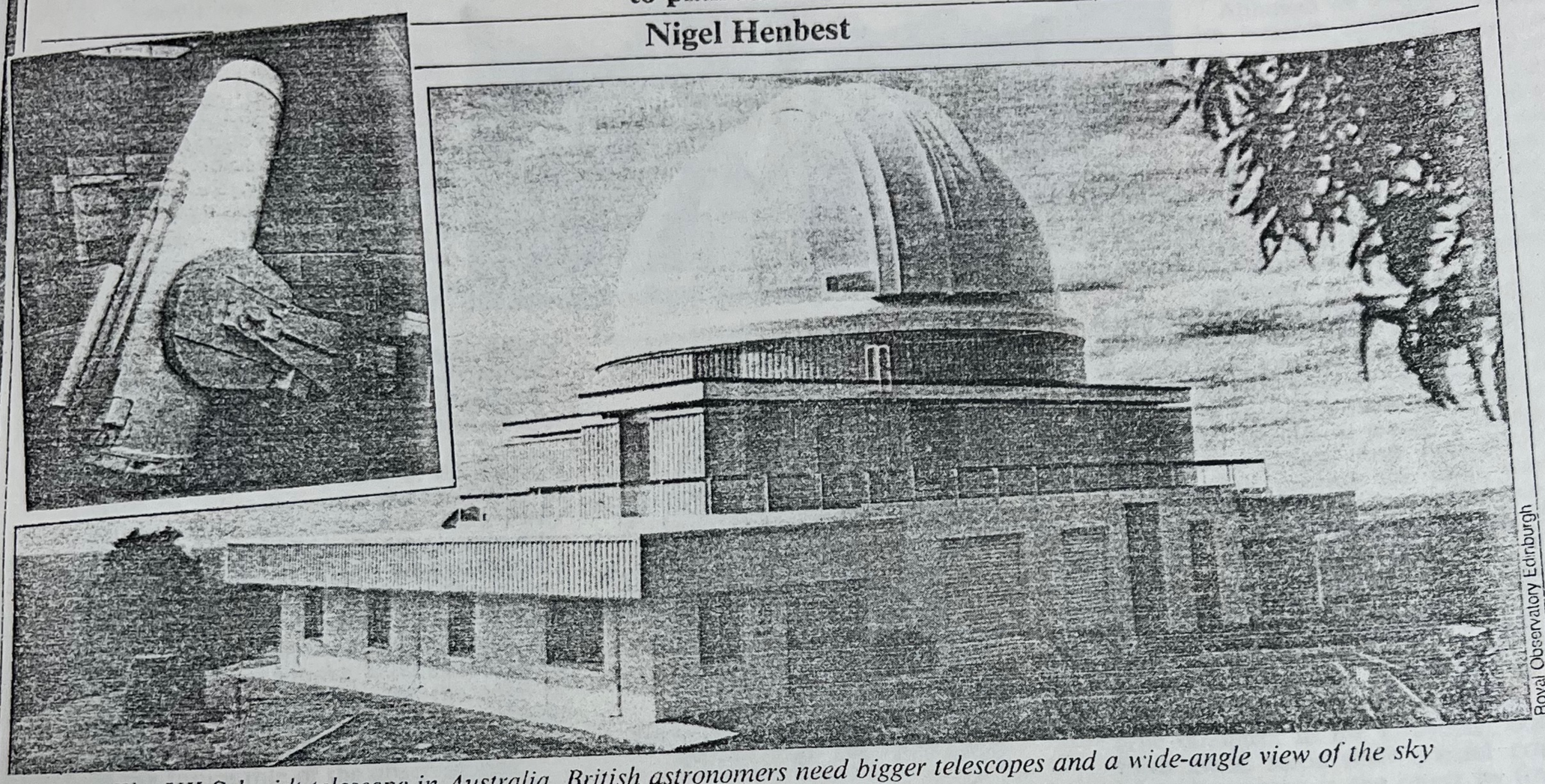
Meanwhile, the government is about to publish a critical report from its own Radiochemical Inspectorate into the incident in January when BNF discharged 400 kilogrammes of uranium liquid into the Irish Sea.

The effluent had accidentally found its way into tanks leading to the discharge pipe that runs from the plant to the sea. This incident was the first in the present chain of accidents. It happened at a time when the government was considering tighter new limits on radioactive discharges from the site, which will be published shortly. □

What future for British astronomy?

For the first time in Britain, practitioners of a scientific discipline have sat down to plan its future

Nigel Henbest



Royal Observatory Edinburgh

The UK Schmidt telescope in Australia. British astronomers need bigger telescopes and a wide-angle view of the sky

TOMORROW, the Royal Astronomical Society (RAS) will debate the future of British astronomy. For the past year, a group of 11 astronomers, under the chairmanship of the Astronomer Royal, Sir Francis Graham Smith, has been trying to formulate a policy for the subject in Britain. The RAS will discuss the group's report, and then pass it on to the Royal Society so that the scientific community as a whole will get a chance to comment.

The study group's main objective was to look at the kind of instruments that British astronomers will need in the mid-1990s. In particular, the report provides a balance between the needs of astronomers using telescopes on the ground, and those using instruments in space.

The group's principal recommendation is that British astronomers will need to get access to a large optical telescope. Next year, British astronomers will start to use the William Herschel Telescope which, with a mirror 4·2 metres across, will be the world's fourth largest. But American astronomers are now constructing telescopes with mirrors 8 and 10 metres across, and they intend to construct a 15-metre telescope. If British astronomers are not to be left behind, they need a similar telescope.

Smith's panel acknowledges that Britain cannot afford to build such a telescope on its own, so it recommends collaborating with others. Possibilities include the University of Arizona, Japanese astronomers, or the European Southern Observatory, which has telescopes in Chile.

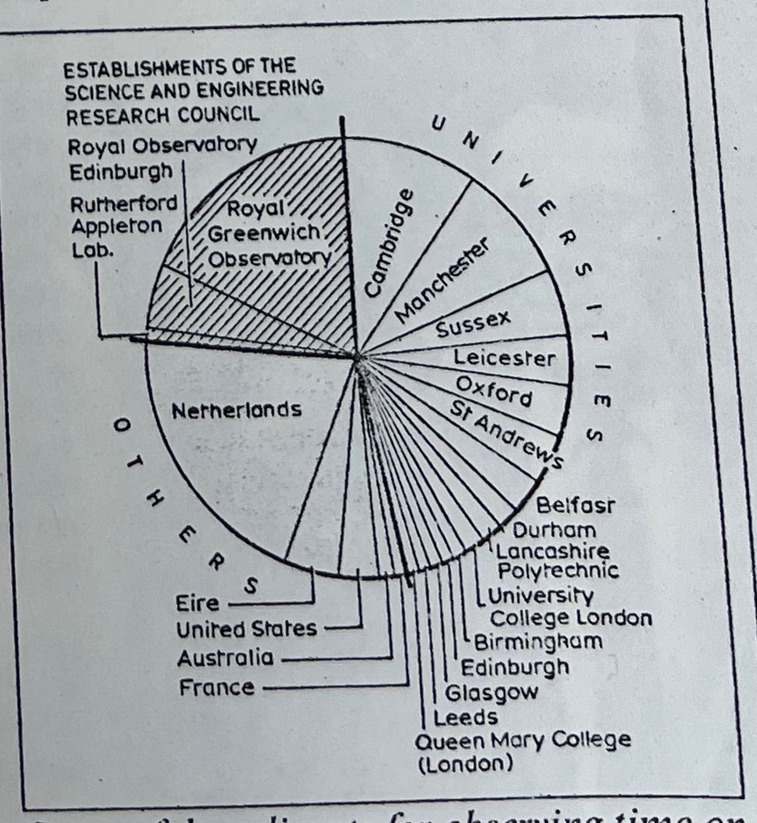
The report also suggests that Britain could usefully build a smaller and cheaper telescope, especially constructed to have a wide-angle view of the sky. There are many such Schmidt telescopes, most work with photographic plates, and one of the best is a British instrument in Australia. But a Schmidt telescope with more sensitive electronic detectors would be a novel and extremely useful instrument for investigating very faint and distant galaxies, the report says.

The study group's most remarkable achievement has been to reach a consensus that satisfies both space-based and ground-based astronomers. The X-ray astronomer Ken Pounds says that he found the report very pleasing: it acknowledged that astronomy was "not just observing from the top of a mountain", and it brought the subject "into the space age". Alec Boksenberg, director of the Royal Greenwich Observatory, feels that the group "has got to the heart of the matter. It has done an excellent job."

Smith's report recommends that Britain should conduct its main research in space astronomy through the European Space Agency (ESA). British astronomers are already involved in building the Infrared Space Observatory, an ESA satellite which will follow up the highly successful Infrared Astronomical Satellite. In addition to satellites to study the Earth's magnetosphere and the Sun, ESA has plans for a satellite that will study the X-ray spectra of celestial objects. Britain's astronomers would play a leading role in research using this satellite, because of the country's previous experience in X-ray astronomy. ESA is also considering a telescope for observing at ultraviolet wavelengths. Although Britain has had no ultraviolet satellite of its own, British astronomers have had a lot of experience with the International Ultraviolet Explorer satellite—still working after almost eight years in space.

But Smith's group says that Britain should keep some money aside for joining in with other space astronomy satellites, if they look especially interesting. At the moment, for example, Britain is collaborating on two X-ray satellites, one West German and one Japanese.

Radio astronomers see their advances coming through an expansion of the technique of interferometry—linking widely spaced telescopes to synthesise a larger telescope. Further dishes would be added to the



Successful applicants for observing time on La Palma (Sept 1984-Feb 1986)

MERLIN array, centred on Jodrell Bank and, by collaborating with European observatories, Britain could regularly be using a radio telescope as large as a continent.

Smith's report represents the first ever attempt to formulate a coordinated policy for the direction that astronomy research should take. The lack of policy has been embarrassingly apparent in recent years, as money became tighter, and astronomers have begun to squabble with each other over what is available. The Science and Engineering Research Council (SERC) has done little to help. It set up numerous panels to "look into astronomy"—but their briefs have been only to investigate how to cut costs in the SERC's own two establishments, the Royal Greenwich Observatory at Herstmonceux, and the Royal Observatory, Edinburgh.

Astronomers are critical of the SERC's latest investigation, into the feasibility of moving the Royal Greenwich Observatory to some site other than Herstmonceux. The SERC says that it is also considering the option of keeping the RGO at Herstmonceux—but many members of the SERC's Council, including the new Chairman, Bill Mitchell, favour a move. Most astronomers believe this is a change for the sake of change, not for the good of the subject. Smith's report avoids commenting in detail on the future role of the observatories.

The two royal observatories in fact account for only one in five British astronomers. Most of the 800-strong astronomical population works in the universities.

Thirty-two of Britain's universities, and three polytechnics, are currently carrying out research in astronomy. The university system gives astronomers the chance to follow up the latest techniques and discoveries and the freedom to follow up ideas that may well come to nothing.

Until the Science Research Council (now the SERC) took them over in 1965, the two royal observatories were pursuing very traditional research in optical astronomy. They had little interest in the new fields of radio and X-ray astronomy. At the universities of Manchester and Cambridge on the other hand, Bernard Lovell and Martin Ryle had the academic freedom to study radio astronomy in the physics departments. Their results showed that radio astronomy was in fact a very important new way of studying the Universe. This was the birth of the radio astronomy observatories at Jodrell Bank and Cambridge, which are still among the world's best. Britain's leading position in X-ray astronomy had a similar birth, in physics research groups led by Robert Boyd at University College, London, and Ken Pounds at Leicester University.

British astronomers are active in virtually every field of astronomy. They cover the entire electromagnetic spectrum from gamma rays to radio waves. They also investigate cosmic rays and study the atmospheres of the Earth and other planets.

Not all branches of astronomy are equally well covered, however. Britain's radio and X-ray astronomy are undoubtedly world-class. So are optical and infrared astronomy. Now that British researchers have large telescopes in Australia, La Palma and Hawaii, Britain's optical and infrared astronomy has recovered from years in the doldrums. Access to data from the Infrared Astronomical Satellite—a project in which Britain had a part share—has also invigorated research in infrared astronomy. Gamma-ray astronomy, however, receives comparatively little support, although Southampton University has a research group active in the subject.

Although we usually categorise research groups as "radio astronomers", "infrared astronomers", and so on, the divisions are not as significant as they once were. Astronomers have broken away from such wavelength categories for one main reason. They have come to realise that the only way to understand the strange objects in the Universe—quasars, starburst galaxies, or whatever—is to study them at every possible wavelength. In particular, virtually every astronomer will at some time need to use an optical telescope to identify whether an object discovered by, for example a radio telescope or by an infrared satellite, is a star, a nebula, a galaxy or a quasar. And optical observations often provide the only way to measure how far the object is from us.

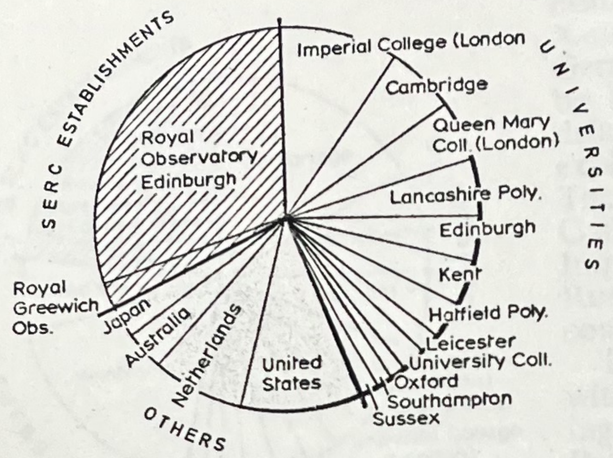
Radio astronomers from Jodrell Bank provide one example of this multi-wavelength approach. During the 18 months up to February 1986, they had more observing runs with the optical telescopes on La Palma than any other British university apart from Cambridge.

British astronomers study almost every type of object in the Universe, but they have made some their special concern. Most important is the quest to find out what is going on in the centres of "active" galaxies—galaxies that have a very small and intense source of radiation at the centre.

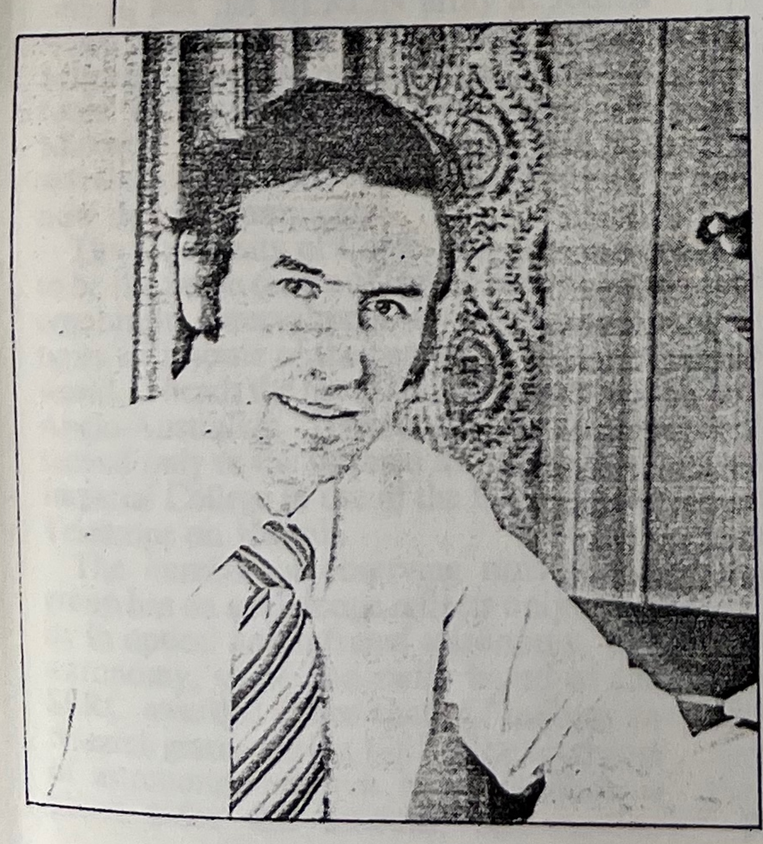
The most powerful are the quasars, where the central source shines as brilliantly as a hundred ordinary galaxies, but is only the size of the Solar System. The first quasars were listed in a catalogue of radio sources made by the Cambridge radio observatory in the 1950s. Other radio sources located by the Cambridge astronomers turned out to be radio galaxies, a type of active galaxy that produces an immense

Jerry Mason

The Astronomer Royal has mapped out Britain's astronomical future



Users of the UK Infrared telescope in Hawaii (Sept 1984-Feb 1986)



Royal Observatory Edinburgh

Jerry Mason

Malcolm Longair (left) and Alec Boksenberg (right), directors of the Royal Observatory at Edinburgh and the Royal Greenwich Observatory. Their institutions are under threat

Astronomy on the move

FOLLOWERS OF the scientific scene in Britain may sometimes have wondered whether the Science and Engineering Research Council (SERC) is acting along the logical and rational lines that science itself is supposed to take. But now even the SERC is surpassing itself. It intends to reject the advice of its own panel (which sat for eight months, but came up with the "wrong" answer); spend £5 million from the hard-pressed science budget; and disrupt the building of an £11 million facility. And the reason? To bring "intangible benefits" (see p 19).

A couple of years ago, the SERC promised the staff of the Royal Greenwich Observatory (RGO) that any decision on its future would be left for five years, until the completion of the La Palma telescopes. It has gone back on its word—with inevitable disruption to the finishing of the observatory.

The SERC is proposing to spend £5 million on moving the RGO from Herstmonceux, at a time when it cannot afford to pay for top-quality scientific research (the "unfunded alphas"). The move would represent an interesting case of negative funding: the SERC would be spending money in a way that would diminish the quantity of research produced, because the RGO would lose the instruments (telescopes, satellite-tracking camera, satellite laser ranger) sited at Herstmonceux.

The SERC argues that moving the RGO to a university would create a synergism: the interaction with university departments would create more than the sum of its parts. Unless the SERC intends to insist on joint coffee breaks or bread-and-cheese lunches, this seems merely a fond hope, given the amount of interdepartmental discussion one finds in most universities. The only case for moving the RGO would be to create a centre of excellence at Cambridge, that would arguably be the strongest astronomy centre in the world. But the SERC has failed to look at the effects of such a monopoly in other British universities.

Herstmonceux is not cut off from the university world. It is linked with Sussex University (though not as closely as it likes to make out). More important, there is a constant stream of visitors from universities to Herstmonceux, to work with the staff of the RGO, or to come to conferences. One argument against Herstmonceux has been its location, but this has now been eased with the building of the M25 motorway around London: Cambridge, for example, is just a couple of hours away. The SERC has spent £50 000 in converting the castle to a top-class conference centre. It is very popular with overseas visitors, and has hosted not only astronomical meetings, but also of science ministers of Western countries.

If we are looking at "intangibles", let us not also forget that Herstmonceux brings together science and the public. It draws over 50 000 visitors per year. The SERC should also remember that the Royal Greenwich Observatory is close to people's hearts in a way that the Rutherford Appleton Laboratory, for example, is not. Public outcry greeted rumours of the demise of "Greenwich time" a few months ago. The observatory did move, after the war, from Greenwich to Herstmonceux—but in a positive way. For the public, it was to an even more romantic site. For the astronomers, it was to expand their activities in a larger site, and under clearer skies.

The proposed new move is a negative step. It will contract the activities of the observatory, disrupt the building of the La Palma telescopes, and cost money that other researchers are crying out for.

A question mark has hung over the RGO for the past five years. That question mark has turned into a sword of Damocles. The SERC has thought itself into a frame of mind where Herstmonceux Castle is a problem: so a solution is needed.

The SERC's own panels have advised against a move. Herstmonceux has not only facilities for research in astronomy, but also a conference centre and public areas that cry out for development. Is it too much to hope that the SERC might have the imagination to see Herstmonceux not as an embarrassment, but as an "intangible benefit" to British science? □

Delayed report

REMEMBER the Sizewell B public inquiry? No doubt the nuclear industry would prefer to forget. The public hearing into the Central Electricity Generating Board's plan to build an American designed pressurised-water reactor closed a year ago this week. Twelve months on, the inspector's report has still not surfaced. The conclusions may emerge around Easter. But the full flavour of Sir Frank Layfield's deliberations will not become available until the autumn when the full report appears.

The CEGB is understandably twitchy, concerned at the escalating costs of delay and nervous that the final decision on the £1·3 billion project seems destined to become hustings fodder, as the date of the next general election creeps closer. One apocryphal story going the rounds suggests that no less a personage than the Prime Minister herself recently rang Sir Frank to find out why he had not delivered. One rumour suggests he hung up on her. Whatever the truth, one thing is clear, Sir Frank is having difficulties making his mind up.

Recent events—the Sellafield saga, the political row over waste dumps and a series of accidents involving the board's Magnox and advanced gas-cooled reactors—have not made Sir Frank's job easier. Nor will next week's critical report from MPs on how we handle radioactive waste. Shortly Sir Frank and his team will move from Oxford, traditionally home of lost causes, to Abingdon. Cold comfort, we forecast, for the nuclear industry which faces not just a winter but now a spring of discontent. □

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FORUM

Should SERC survive the cash crisis?

The crisis in funding has brought about a crisis in confidence, as Ros Herman explains

WHY, WHEN science is a long-term business, is the Science and Engineering Research Council (SERC) incapable of planning more than six months ahead? And if SERC cannot marry the way that it administers its research grants to the natural time scales of the research itself, what purpose does it serve?

In the nature of things, astronomers take the long view, and they are the first group of scientists to try and assess for themselves the future of their subject, independently of SERC. As the Astronomer Royal, Professor Graham Smith, pointed out (*New Scientist*, 16 May, p 44), the Royal Astronomical Society (RAS) and the Royal Society are jointly drawing up a "corporate plan" for the subject. They intend to draw up a list of scientific projects that Britain should start, or continue with, if it is to remain in the international league for astronomy.

The RAS has sought the views of astronomers throughout the country, and, having digested this information, is currently trying to draw up a paper that describes the astronomy community's common vision of the future. The Royal Society will continue the process, feeding in the views of scientists outside astronomy. Finally, the Royal Society, in its role as the most authoritative voice of the scientific community in Britain, will give its imprimatur to the document. The idea is that the government, and its agent, SERC, will find it difficult to ignore the astronomy community's view of its own future.

But why is all this necessary? Why do so many scientists regard SERC as merely the agent of central government?

The research councils are made up of scientists who, ideally, should take all the relevant factors into account in their planning. This is no longer (or perhaps never was) the case. For the astronomers, the crunch came last summer, when SERC was deep in a cash crisis. A lot of money had to be found—and quickly. Chief candidate for the chop was the Anglo-Australian Telescope, which has been described as the best telescope in the southern hemisphere, and into which British astronomers have put an enormous investment of time and money. It costs SERC about £1 million a year to run.

The astronomers were astonished to find SERC considering such panic measures, and moved quickly to articulate their views without SERC's interference. It was Tony Hewish, Nobel prizewinner and director of the Radioastronomy Observatory at Cambridge, who set the RAS/Royal Society studies in motion.

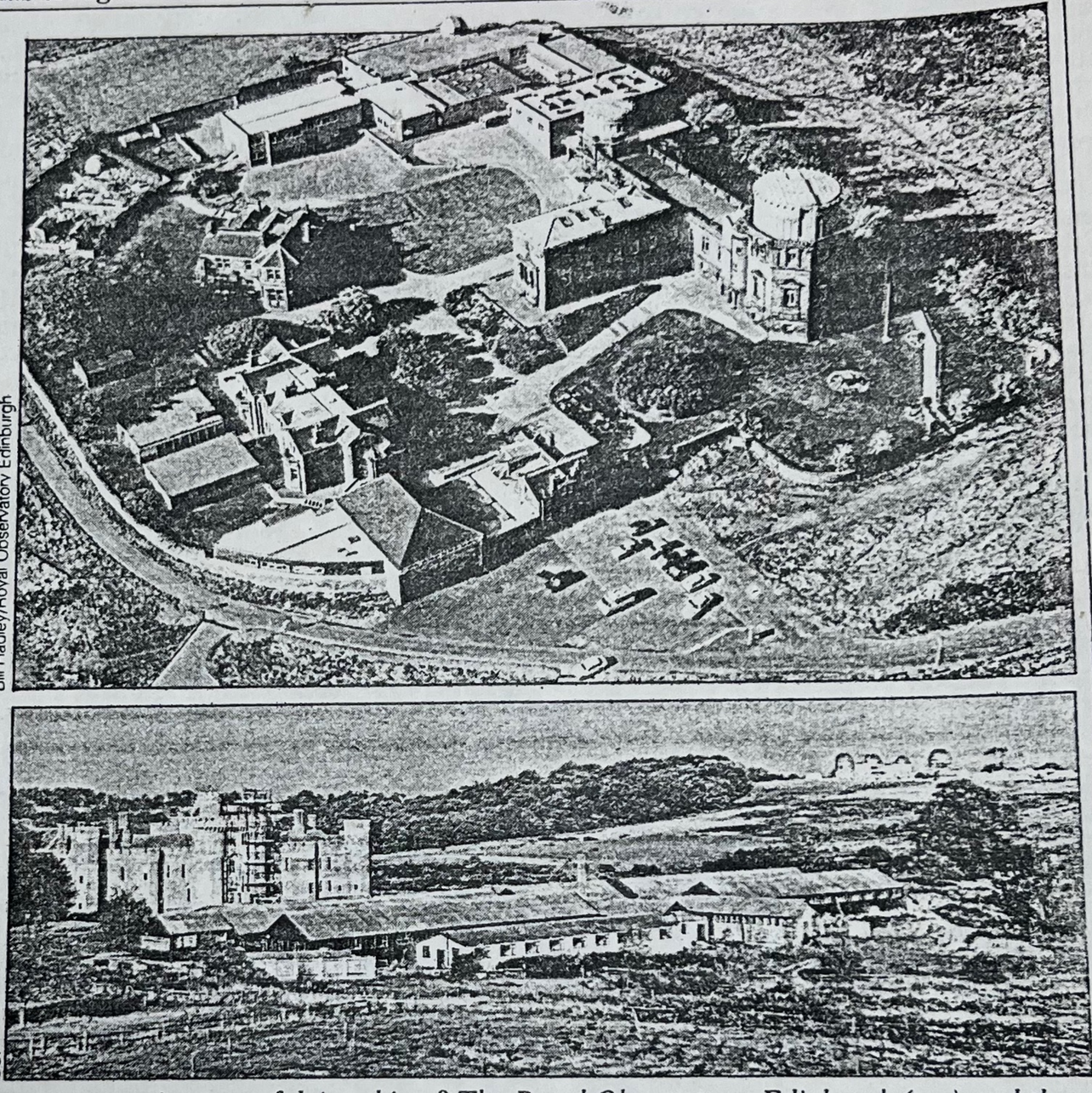
But this is only part of the story. Not just astronomers, but practitioners in many other scientific disciplines, have found themselves at odds with SERC for some time. For nearly all practising scientists, SERC is not a gathering of the great and good who guide the future course of British science. It is an address in Swindon to which they have to send long and complex forms dealing with deadlines, money, format, categories of expenditure, and other official niceties. It is also a place to telephone and talk to a bureaucrat about committees and proposals and amendments to memoranda, but rarely about the mysteries of the stars or the atom.

Of course, the scientists who make up SERC's committees do sit down from time to time to consider the proposals put before them. These might range from a bid for a few hours of telescope time to a plan for a new multi-million-pound telescope or satellite experiment. But a lot of work has to be done before the meeting, and it is the bureaucrats who do it. Astronomers feel that this gives the civil servants too much power to influence the final decision to suit their own views or convenience.

To be fair, the bureaucrats are bound by the way that SERC was set up in the first place. Radio astronomers would, for example, like to attract competent and experienced technicians to help to set up and maintain their telescopes. So the natural thing to do is to ask SERC to do this; after all, it would enable them to make the best use of equipment that SERC has provided at great expense. But, because of a "rule", SERC can offer such employment only on a temporary basis, which makes the job unattractive to anyone who is half way competent. This particular rule has resisted intensive lobbying by the most senior researchers.

The situation is even worse when it comes to the two national observatories, the Royal Observatory, Edinburgh, and the Royal Greenwich Observatory at Herstmonceux in Sussex, which SERC runs and where the employees enjoy better conditions than their peers in the universities. This is perverse, because, according to SERC, the staff are there to "serve" the academics by providing them with the facilities they need to do their research.

Some observatory staff, mainly engineers, do just that. But for the career



Bill Hadley/Royal Observatory Edinburgh

An expensive way of doing things? The Royal Observatory, Edinburgh (top) and the Royal Greenwich Observatory at Herstmonceux in Sussex

astronomers employed in the observatories, support work is a chore akin to teaching for academics. They can "support" other astronomers only at a price to their own original work. So it would make sense for these astronomers to take only a short-term job at an observatory. They could then go on to a university to teach and hence pass on their skill, leaving a place in the observatory free for someone with new ideas. But "the rules" say that only 1 in 10 staff members at a SERC establishment can be temporary. The rest, however young and inexperienced, have to be given permanent jobs.

The rigidity of SERC's own establishments has led astronomers to suggest that all the observatories' work should now be transferred to an institute based at a university. Academics believe that such an institute could be more cheaply and flexibly run than a SERC establishment, with more interchange of jobs and ideas between research and administration. Cambridge seems to be the obvious choice, with its own institute of astronomy, though Manchester and London also have large groups of astronomers. Of course, SERC would have to provide substantial funding, including some full-time tenured posts for administrators to keep control of large and complex pieces of machinery, some of which would be thousands of miles away.

Another radical proposal, but one that no astronomer approves of, is that the observatories should be run from SERC's largest establishment, the Rutherford Appleton Laboratory. This enormous multidisciplinary laboratory costs SERC £55 million a year to run. It provides technical support to almost all the disciplines that SERC funds. But no astronomer has a good word to say about the idea of letting it run their affairs. They point out that it costs more to keep an astronomer there than in the observatories, and certainly more than in a university. (SERC, of course, does not pay any of the "overheads" of staff employed by universities.)

Astronomers can no longer rely on SERC to plan the long-term future, because so many other issues cloud the skies that the fundamental ones are forever obscured. The geologists in the Royal Society have recently panned the Natural Environment Research Council along the same lines, but they have not yet gone so far as to set up their own alternative planning body.

No one can deny that the past few years have been hard ones for almost everyone in the scientific community. But it also seems clear that the members of SERC have failed to keep the confidence and respect of scientists. With unhappy scientists on one hand, and crass government policies on the other, it will be interesting to see whether the current structure of the research councils will survive the upheavals now facing British science. A more immediate question for SERC is, does it deserve to? □

Correction The photograph accompanying "Southern astronomy: it's all in the stars", by Tony Jones (*New Scientist*, 15 August, p 49) showed the Australian National University's observatory at Siding Spring, and not the Anglo-Australian observatory as indicated. Apologies to the author.

Lament for a tiger

Bob Ralph on the demise of the Javan subspecies, *Panthera tigris sondaica*

I READ last week that you were extinct. Not headline news, just a line in a *National Geographic* article about the endangered Javan rhinoceros. You both have, or in your case had, your last stronghold in the Ujong Kulon reserve at the very western tip of Java. A remarkable reserve: at one time it held three of the world's most endangered large mammals—yourself, the rhinoceros and the banteng, a large wild ox. Now it's down to two and, with only about 60 rhinos left, it may soon be one.

There may well be a grander obituary for you somewhere else, but, if so, I haven't seen it. We have been a bit preoccupied recently with problems in Ethiopia. Our top people's newspaper has been acutely concerned about the correct way to peel an orange.

I knew you were in trouble: last year, I read that there were only four or five of you left. I felt sad about it, but what could I do? I had already joined the World Wildlife Fund, sold raffle tickets, talked to anyone who would listen about extinction rates, disappearing forests and red data books, but even among professional colleagues no one seemed seriously bothered.

We have a stuffed tiger in our museum, one of your Indian cousins. No one knows how we got him, probably a gift from a relative of someone in India at the time of the Raj, when anyone who was anyone got to shoot a tiger. Our specimen was a bit tatty, and had been relegated to a cupboard. I got it out and put it on display with an exhibit about the plight of your species. Students were interested, but the same question kept coming up: "What can I do about it?" I talked away about supporting conservation groups, trying to adopt low-impact lifestyles, writing to express support to the Indian government in its valiant efforts to save *its* tigers despite all the other problems, but none of it sounded very convincing.

Of course, in Java, you were only a subspecies of the Indian tiger, with cousins in Bali, Sumatra, Indo-China, China, Siberia, and the Caspian area. Apparently your last Bali relative was collected in 1937, and most of the family is perilously close to extinction. I'm an old fashioned kind of zoologist, who enjoys seeing animals in the wild and in good zoos. I can't remember ever seeing you, certainly not in a zoo, and not even in a museum. I expect that somewhere in the great museums of the world there are some bits of you, a skin, some skulls, some odd bones, locked away in cupboards, like treasures in a Pharoah's tomb. In years to come, some ardent taxonomist will dig them out, measure a few characters here and there, apply some new computer-based techniques, and argue about your status—that you were subspecific, or a race or a variety—and produce a learned paper to be read by perhaps a dozen enthusiasts. Our grandchildren might forgive us for not leaving more.

I remember reading somewhere that your species had probably killed more of our species than any other large mammal. Bad habit that, eating people, but we have certainly wreaked a terrible revenge. When it comes down to it, I don't suppose there were many of us who really wanted you out of the way. A generation or two ago, we may have wanted you as a trophy, a spectacular rug to be admired, but more recently we just needed the space, the trees, the land to feed ourselves, so you and others like you just had to move over,

I'm sure there was no real malice, but then you never ate one of my relatives or one of my goats. We were just careless and had other things on our minds. You should have been a few splashes of paint by Rembrandt, or a decaying city slowly sinking into the Adriatic, or something we could price in dollars. Extinction is something that our minds can't seem to grasp completely; for all the talk of loss of genetic diversity, the message doesn't seem to get through. Extinction is forever, and all the money in the world couldn't bring you back. □

Bob Ralph is a senior lecturer in the department of zoology at the University of Aberdeen.

Mary Evans

Remember the good old days?

Small thinking on particle physics

AS WITH many reports these days, the joint report of the Advisory Board for the Research Councils and the Science and Engineering Research Council on high-energy particle physics in the United Kingdom has been long awaited and widely leaked. This much is common place. What is less usual is the report's strange lack of consistency. It gives the impression that the committee, under the chairmanship of Sir John Kendrew, could not agree on what to say (see p 10).

The committee seems certain that CERN, the European centre for particle physics, does excellent work. On one page of the report, it congratulate's the director general of CERN for building LEP—a large electron-positron collider—within financial constraints (a constant budget). Yet it seems to believe that it will be possible to cut CERN's budget by 25 per cent once LEP is built, despite the fact that there is clearly little "slack" in the budget. The report expresses concern that CERN remain a world class facility, yet acknowledges that the recommended savings "cannot be achieved without considerable disruption". It says that there must be enough money for British physicists to contribute to the research, yet asserts that by any standard Britain now spends too much on particle physics.

Other countries do not seem to agree. Italy recently doubled its support for experiments at CERN. And, as pages of the report show, Britain now ranks below the Netherlands, Belgium, Sweden and Switzerland in terms of their relative level of support. Even Portugal, often described as Europe's poorest nation, is joining CERN.

The ABRC-SERC report speaks kindly of CERN while dealing it a body blow. Perhaps it did this unwittingly. Maybe the committee is truly ignorant of the ramifications of the cuts it recommends—it certainly shows little sign of understanding how they could be implemented. It all rather suggests that the eminent gentlemen have not done their homework. The scientific community has a right to expect more than this of a committee whose comments will echo around the world.

On the other hand, the committee may well appreciate all of this. It may, in its way, be adding its voice to the growing tirade against the attitude of the British government towards the funding of science. Particle physics certainly has to share in the agony, but if the result is to be the death of the subject, then perhaps it is the agony that deserves criticism—something that the report could have provided if it wanted to.

CERN's worth cannot be measured in Swiss francs, non-stick frying pans, or even Nobel prizes. Its value lies in the fact that it has long surpassed its aim to bring Europe together. CERN has become a truly international laboratory. It deserves better analysis and thought than are evident in this report. □

Astronomy is looking grim

THE INAUGURATION next week of the world's newest big astronomical observatory, at La Palma in the Canary Islands, should be a proud culmination of 15 years of planning, testing and construction. Instead, the new observatory is opening against a background of financial cuts that are falling as hard on astronomy as on the rest of science, with the exception of military "research". Add to this the government's pressure on the SERC to lean towards engineering, and the strain on astronomy and high-energy particle physics becomes even more intense.

The problem in astronomy facing SERC is how it can make the best use of its large investment in La Palma and other telescopes abroad. Instead, SERC has hastily convened a panel to peer myopically at the role of its astronomy establishments in Britain. Yet again, astronomers are faced with a review of the proposal that either the Royal Greenwich Observatory or the Royal Observatory, Edinburgh, should close, or merge into some other institution. The last time that this issue came up was as recently as last year, when another review panel within SERC considered a merger and found no advantages in such a move.

The new panel contains no practising astronomers. And SERC has divided the community of astronomers, some say deliberately, by asking its four establishments and universities with large astronomy departments to "bid" for control of the telescopes abroad.

Would it not be better to convene a committee of practising astronomers, drawn from the spectrum of opinion and wavelength, to include the Astronomer Royal and the president of the Royal Astronomical Society and to set the group on a review of the future of astronomy and to ask it to arrive at a consensus on research priorities in the light of financial constraints? Such a committee does exist, recently set up by the Royal Astronomical Society and the Royal Society. This second group will report after SERC's panel has rushed through its discussions and reached its hasty decisions; but the very existence of the second panel makes it important for SERC, if it wants to maintain the sympathy of the community that it is supposed to serve as much as it serves government, to wait until it receives all of the evidence. If nothing else, SERC will look very silly if its review is completely at variance with that of the royal societies.

To safeguard the future of astronomy in Britain, SERC's panel must consider options that are more radical than simply closing an institution. One possibility is to fund the observatories separately from other, short-term activities so that these institutions, with projects that demand a commitment of 30 years or more, are protected from the annual scramble for cash. Another idea, favoured by many astronomers in Britain's universities, would be to close both observatories and to put a small staff at each of the overseas telescopes. Unless SERC's panel widens its terms of reference, it can hope to do no more than stumble forward with stop-gap solutions to short-term emergencies. □

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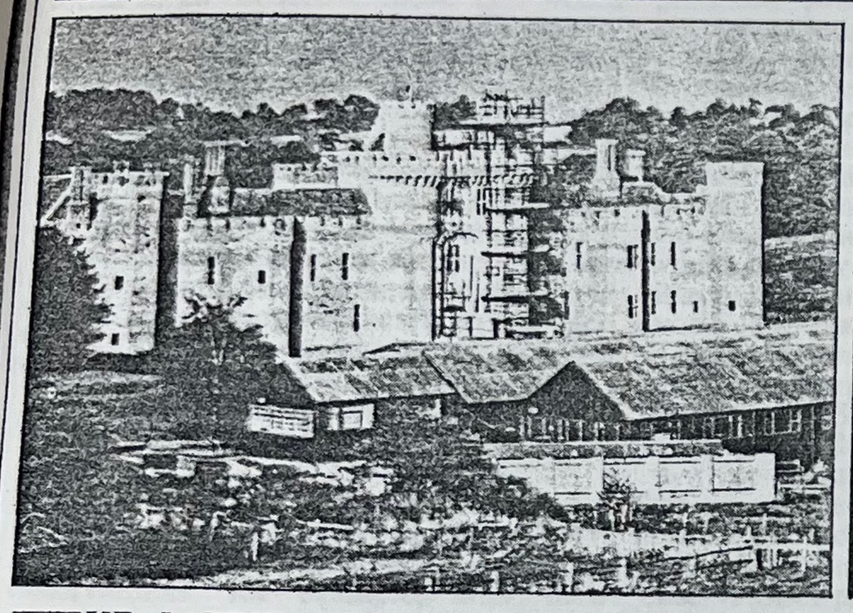
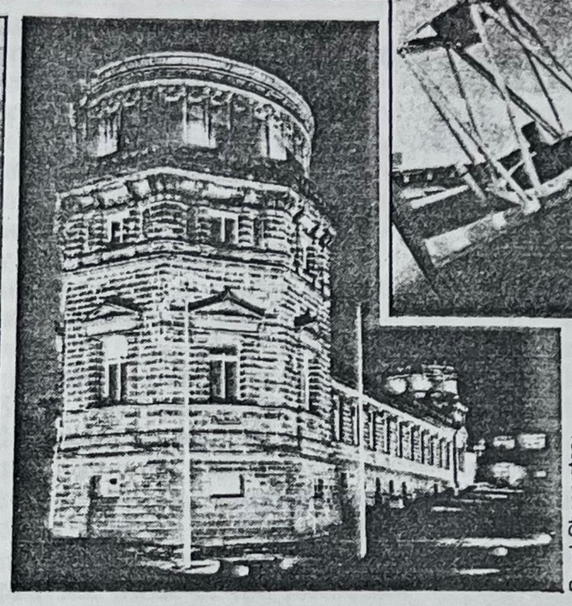
Battle royal for the skies of La Palma

Two major observatories run telescopes for Britain's astronomers. Soon they may be combined into one, and both are making a strong case to retain their separate identities

Steve Connor





Royal Observatory,

Rivals for the focus of British astronomy. The star of the south, the Royal Greenwich Observatory, which is now sited in Herstmonceux Castle in Sussex. The original Greenwich Observatory dates back to 1675 (far left). The queen of the north, the Royal Observatory, Edinburgh, founded in 1776, moved to Blackford Hill (above) in 1896

THE LATEST, brightest and possibly the last jewel in the crown of British science goes on public display next week. Royalty will be present (both British and Spanish), as will six heads of state and a collection of the world's eminent astronomers.

However, the official opening of the site on La Palma in the Canary Islands, where Britain has invested millions of pounds in astronomical equipment, including a giant optical telescope 4·2 metres in diameter, will show little if any indications of the crisis that has beset British astronomy. This month, a high-level committee of senior astronomers and science administrators is sifting though the replies it has received to its suggestion that the management of British astronomy should undergo a fundamental reorganisation. One of the major issues is the question of who should control British interests on La Palma.

The present turmoil in British astronomy, which is engulfing the whole astronomical community, is the result of two things. First, a series of unfortunate decisions since the Second World War left a legacy of wasted money, wasted opportunities, and a sour taste in the mouths of many astronomers. Secondly, the massive reorganisation of the country's astronomy comes at a time when cash is in very short supply.

The two men who are in the unfortunate position of combatants for control of La Palma are the present directors of Britain's two astronomy centres: Malcolm Longair, the director of the Royal Observatory, Edinburgh (ROE) and Astronomer Royal for Scotland, and Alec Boksenberg, the director of the Royal Greenwich Observatory (RGO), who is currently in charge of La Palma.

It is not a foregone conclusion that one or other will become the director of all Britain's telescopes sited overseas. Nevertheless, the aim of the investigation into the RGO and ROE is to see whether their activities can be brought under one roof, one management and one director. It is not a frivolous inquiry. Many people, leading astronomers included, believe that it is inevitable that both observatories will be merged into one Royal Observatory for the whole country. To many other people, the talk of a merger will not be a surprise. Ever since the Science and Engineering Research Council (SERC) took control of both observatories in 1965, the suggestion has cropped up time and again.

This time it is different. The crisis hitting British science really began to bite at the end of last year. The government made it clear that science is no exception to its strict rules on clipping the wings of public spending. The international decline of sterling against other currencies puts ever greater pressure on science projects where sterling has to pay for things abroad. Astronomy, being so international, is one of these.

The SERC, in fact, has taken kinder to astronomy than to many of its other activities. It has agreed to finish off La Palma's 4·2-metre William Herschel Telescope, which should be complete in 1987. Nevertheless, the SERC's realisation this year that it has a crisis on its hands means that the old idea of just one astronomy centre has again to be considered.

Restoring former glory

Since the Second World War, Britain, although it has produced some of the finest thinkers in astronomy, has lacked the right optical telescopes to build on this expertise. After the Second World War, it was agreed that a new telescope would be built that would restore British astronomy to its former glory. It took 21 years for this to come about, with the completion of the Isaac Newton Telescope (INT). The delay was partly the result of a decision to design a completely new telescope rather than rely on existing designs. That was the first mistake. The next mistake was to site the telescope in Britain, where the conditions for observing the night sky are poor. The INT was built at Herstmonceux, which has an unusually high proportion of clear nights for a British site; but it is only just above sea level, and the humidity from nearby marshes played havoc with the telescope's delicate mirrors.

The INT became officially operational in 1967, and the site's unsuitability became immediately obvious. Eight years later, with the added incentive of cheap air travel, the SERC decided to move the telescope to La Palma. With hindsight, it would have been cheaper to build a new telescope from scratch rather than move the old one. But this would have meant a redundant telescope at Herstmonceux, which would have soaked up resources. Furthermore, the INT is an equatorial telescope (the mounting is tipped parallel to the Earth's rotation). Although in vogue during the mid-1970s, because it was relatively cheap to build, this type of telescope is not as good as the alternative altazimuth, where the axis is tipped up and down like a cannon. More recently, the cost of altazimuth telescopes has come down, partly because the computers needed to control their movements are cheaper.

Ideally, the SERC should have chosen to build a new, altazimuth telescope on La Palma to replace the INT at Herstmonceux. Ben Martin and John Irvine, of the Science Policy Research Unit (SPRU) at the University of Sussex, have compared the performance of the INT while it was at Herstmonceux with similar telescopes elsewhere in the world. Irvine and Martin explain: "While there exist no perfect measures of contributions to scientific knowledge, there are several 'partial indicators'—that is, variables determined partly by the magnitude of the particular contributions, and partly by 'other factors'." The indicators they used were: number of papers produced; the number of times each paper was cited by other researchers; and the number of highly cited papers. They compared the INT with three other telescopes and found that the INT fell short of its expected performance: "In fact it falls short . . . by a factor of six in terms of numbers of papers published over the decade, by a factor of seven in terms of

What university astronomers think

UNIVERSITY astronomers are the main users of Britain's telescopes overseas. Most of them would view a simple merger of the two royal observatories as an ineffective move that would owe most to political than scientific considerations. They would prefer to consider more radical options, such as closing both observatories and retaining only staff with the telescopes abroad.

Although university astronomers generally accept SERC's case that amalgamation can reduce costs, they have severe reservations about its effect on research and on jobs. Last year, SERC insisted on the RGO and ROE reducing their staffs to 120 each by the 1990s. This would compare with 240 before the cuts at RGO and 180 at ROE.

Many astronomers think that an institution of this size, where everyone is in constant touch, is more suitable than a larger combined establishment for running a specialised facility like an observatory: morale has fallen at three of America's observatories, for example, after their amalgamation as a single National Optical Astronomy Observatory at Kitt Peak.

Rivalry between two observatories in Britain can even be an advantage—it has produced two leading radio astronomy centres, at Jodrell Bank and Cambridge.

Many astronomers are suspicious that internal politics at SERC may have undue influence. For example, ROE may be retained, in some form, simply to maintain a SERC establishment in Scotland. Amalgamation of one or both observatories with the huge Rutherford Appleton Laboratory would be very convenient for SERC, but astronomers unanimously consider it "the worst of all possible outcomes".

Some astronomers are also sceptical about the composition of the review panel appointed by SERC. The initial invitations did not include an active optical astronomer, for example; and only one member has experience of running an observatory, and he is Dutch.

But the main worry is over jobs. The two observatories provide most of the tenured jobs in astronomy, and many would be lost on amalgamation. The Royal Astronomical Society has recommended to SERC that any staff shed should be taken on secondment by universities.

Everyone is keen for closer ties between the observatories and the universities, and one option is to resite the RGO (or a combined observatory) at a "green field" site by a university strong in astronomy—for example at Cambridge or Jodrell Bank (part of Manchester University).

Some astronomers would like to see the home-based observatories closed down completely. La Palma and Hawaii could each have a small staff of technicians and astronomers, under a resident director. The Anglo-Australian Observatory, in New South Wales, already works this way, with astronomers staying for three-year stints. The universities in Britain would run the research effort, and develop new instruments under contract to SERC.

Nigel Henbest

the total number of citations gained in 1978, and by a factor of up to 10 in terms of highly cited papers."

It appears, then, that the INT's life at Herstmonceux was a disaster, and few astronomers would dispute this. Boksenberg says that SPRU's analysis was nothing more than a test of Martin and Irvine's techniques. It was a "non-issue", he says, because the poor performance of the INT was due to its site, and everyone now realises that. But Martin and Irvine have suggested another reason for the difference in the performance of the INT from comparable telescopes: "According to a large section of the astronomical community outside the RGO, the site only explains part (albeit a major part) of the difference; the remainder is related to the way in which the RGO discharged its responsibility for the support and operation of the telescope."

Even though all this was before Boksenberg's time, he has the unenviable task of convincing the SERC's review committee that suggestions that the observatory mismanaged the INT are untrue, and that the future handling of La Palma will be trouble-free. Like it or not, Boksenberg has to live with the realisation that many astronomers hold the RGO responsible for some of the problems of the INT.

The northern sky

In 1969, before the decision to build telescopes at La Palma, the Science Research Council (SRC changed its name to SERC in 1981) set up a committee to investigate how best to study the sky in the northern hemisphere. It was called the Northern Hemisphere Review Committee, and was chaired by Sir Fred Hoyle. The report of this committee was never published. The SRC decided to suppress it because its recommendations were too radical.

More importantly, the two astronomers royal of the time, Sir Richard Woolley and Professor Hermann Brück, who were both on the review, disagreed with the rest of the committee, who wanted a new centre to take control of optical astronomy in the northern hemisphere. They argued that the new facilities, which later became La Palma, should be operated by a centre other than the RGO or ROE. After it had consulted the astronomy community in the universities, the committee found: "Among university astronomers consulted only one, nearing retirement, saw no need for change. All others favoured reorganisation, mostly of a radical nature, but there was no unanimity of view as to what should be done." Some favoured the creation of a new centre: a few wanted it to be alongside, or even in, the RGO.

The evidence from this committee was not only ignored, it was never publicly discussed: the SRC swept its conclusion under the carpet, and gave control of La Palma to the RGO. The ROE, meanwhile, became the administrative centre for the UK Schmidt Telescope in Australia and the UK Infrared Telescope in Hawaii. Shortly it will help to run the new millimetre-wave telescope, which is also on Mauna Kea in Hawaii, when that starts work in 1986.

One of the members of the Northern Hemisphere Review Committee, Geoffrey Burbidge, who later became the director of the US's national observatory at Kitt Peak, was angry at the decision to suppress the report. In 1972, he wrote a strongly worded letter to *Nature* "to share a few home truths", including his opinion that British optical astronomy is only third rate.

If the SERC's review committee comes to the conclusion that the two observatories should now be merged, Burbidge thinks that the Edinburgh site "will get the nod". Even in the early 1970s, he says, the Edinburgh option was preferable. "Boksenberg will be unhappy, and he has reason to be."

The financial savings to be made by a merger are small. Longair says that the cost of running a combined outfit will be something like 3 per cent less than running two separate bodies. Boksenberg put it another way: merging will save a maximum of 0·1 per cent of the SERC's total budget. "What is the council doing thinking of a 0·1 per cent saving when one is looking for 10 per cent?" he asks. As far as he is concerned, it would be more pertinent to look into the activity of the Rutherford Appleton Laboratory, which eats into a much larger portion of the SERC's pie.

Longair does see positive advantages in merging the two observatories, and understandably wants the RGO to come to Edinburgh. "It is no longer sensible to consider ground-based astronomy as a number of separate programmes. I want to see it as UK Astronomy Inc if you like." Only by merging the two centres, he says, will it be possible to cope with the much tougher cuts in astronomical research that may come in the future. "It's the ability to have managerial flexibility," he says, "so that, for instance, we can deploy people more effectively." Longair has already applied for planning permission to extend the ROE, and this extension includes the possibility of taking on extra work from the RGO—in essence, the control of La Palma.

In contrast, Boksenberg is not actively looking for the ROE's work. He still thinks that merging the two centres will cause unnecessary disruption to La Palma and will fail to produce the sort of savings that the SERC needs. By moving the RGO to Edinburgh, he says, the SERC will have to spend nearly £6 million building new facilities, and will raise only £2 million from the sale of Herstmonceux Castle and its grounds. It would be cheaper to move the ROE to Herstmonceux.

Both Boksenberg and Longair agree that the alternatives of moving all of Britain's astronomy to the Rutherford Appleton Laboratory would be dangerous. Moving RGO to a university campus will still cost too much, and leave optical astronomy divided.

By the end of the year, both directors should be put out of their misery. In the meantime, there will be much lobbying of both to protect the interests of their respective establishments. □

Observatories face shotgun marriage

THE MOST serious attempt in recent history to merge Britain's two senior astronomy observatories will be made later this year. It will mean the estiblishment of one astronomy centre for the whole country, and the closure of either the Royal Greenwich Observatory (RGO) or the Royal Observatory, Edinburgh (ROE) (or possibly both).

The Science and Engineering Research Council (SERC), which took control of both observatories in 1965, is about to set up a high-level committee of astronomers and administrators to consider this option. The council is already assessing the relative cost of moving all of Britain's astronomy to one of its four research centres. These are: the RGO and ROE themselves, the Rutherford Appleton Laboratory at Didcot, and the Daresbury Laboratory at Warrington.

Armed with this financial information, the review committee will then take account of the scientific implications of a merger, before coming to a final decision, sometime in the autumn.

This week, the chairman of the SERC, Sir John Kingman, wrote a letter to the Royal Astronomical Society asking its members to submit their views on the plan. In the letter, Kingman explains that the SERC will "initiate a study of the functions, the location, and the management of the establishment which it currently maintains for the support of ground-based astronomy".

Ever since 1965, when SERC gained control of the ROE from the Scottish Home and Health Department and the RGO from the Admiralty, there has been talk of merging the two. Two years ago, the SERC's Astronomy Space and Radio Board looked at such a possibility. But each time the suggestion came up, the two observatories made a good case to retain their independence.

Today, the pressure on the SERC's funds has never been greater. The council is involved in a massive review of all its operations in order to identify areas where cuts can be made. Astronomy is no exception.

The feeling, even among the astronomy community, is that Britain can no longer afford to duplicate its astronomy research. As one astronomer said: "The joint pursuit of rather similar objectives by rather similar institutes is on the whole a rather bad thing."

RGO

Boksenberg: low morale

The administration of British astronomy is even worse, he said. "The control is in the hands of bureaucrats who want more and more equipment because it gives the appearance that they are doing something. All the clever people concentrate on building equipment rather than thinking about astronomy."

The secretary of the ROE, Bennet McInnes, believes the attempt to merge the two observatories has never been more serious. But he is confident that the ROE will survive: "Some people would love to say that we've got our backs against the wall, which is not the case."

The SERC is keen to play down its review of the two observatories, partly because of the embarrassment of having to cut staff at the same time as opening the RGO's large telescopes at La Palma in the Canary Islands, and partly because it does not want to cause a fuss among astronomers, which could upset the outcome of the review.

The RGO's director, Alec Boksenberg, said: "We'd rather at this stage be thinking entirely about the La Palma project than spend time on other issues. If the morale of staff is affected, it's harder to get the best out of people." His counterpart at the ROE, Professor Malcolm Longair, says that his establishment is already very cost-effective. Boksenberg says that the RGO has the lowest overheads of any SERC establishment. A merger would increase costs.

The SERC has asked each director to put up a tender that justifies why their establishment, under their direction should be Britain's main centre for astronomy.

The SERC's secretary, Ashley Catterall, said last week: "Over the summer, we will be having the widest possible discussions on scientific principles as well as cost options." The SERC will consult not only its two observatories, and its own astronomy board, but astronomers in the universities, the Royal Socieity and the Royal Astronomical Society. □

FORUM

Why you should move to Manchester

Tony Jones drops a line to the Royal Greenwich Observatory

SO, IT IS decided. The Science and Engineering Research Council (SERC) has directed that the Royal Greenwich Observatory (RGO) should be moved from its home at Herstmonceux Castle in Sussex. At present, it is deliberating on where to rehouse you.

Few people seem happy at this decision. Are the "intangible" benefits of the move really worth the disruption and loss of morale that will ensue? The Royal Astronomical Society (RAS) has conducted a poll of its fellows to find out what astronomers really want. I voted that you should stay where you are; nearly two-thirds of the people who voted did the same. But, barring a last-minute loss of nerve by the SERC, the die is cast. You will have to go.

We should now be discussing where to put you. I regret that public debate has not moved on to this important matter, as a decision is imminent.

The RAS also requested its fellows to declare a preference among three options on where to put you or to nominate a fourth. The three options, as set forth by the SERC, were as follows. First, to move you to Edinburgh alongside the Royal Observatory there. Second, to send you to Cambridge University. Third, to move you to Manchester University. That was the SERC's order of preference. It did not say why. The astronomers polled put Cambridge first, Edinburgh second and Manchester third.

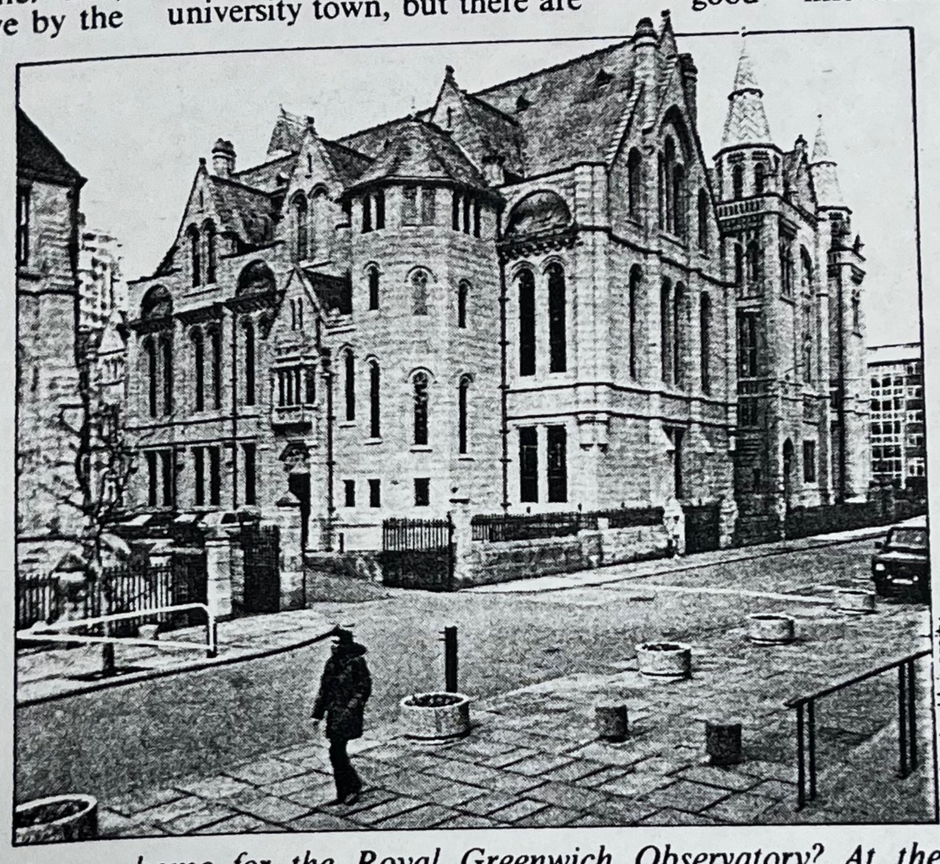
Much has changed since you made that historic move from Greenwich to Herstmonceux in 1949. For one thing, the skies over Britain are simply not good enough for the demands of modern astronomy, and all our big telescopes are now on superior sites overseas. Secondly, the main research effort, with all its rich diversity, now lies firmly in the universities where it belongs.

The SERC has long recognised and encouraged your changing role. The main job of the Royal Observatories is to provide the telescopes and services that the universities need and which none could afford on its own. The RGO, in particular, is responsible for the new telescopes on La Palma in the Canary Islands. The question is, then, where would you be best placed to perform this function?

All three places have good claims. Edinburgh already has a first-rate Royal Observatory with similar, but complementary, functions to your own. Cambridge is the country's leading centre for astronomy of all kinds. But lest you are resigned to moving to Scotland or the Fens, let me put in a word for Manchester.

I want to assure you of one thing. Despite what eminent people may have written, there is no question of your being "dismembered". If you come to Manchester, you will come as the Royal Greenwich Observatory and stay that way. Because of your size and importance, you will play second fiddle to no one. There are no other SERC establishments here to prey on you.

But Manchester? You probably think of it as a grey smudge—dark, dismal and damp—somewhere "up north". (The place marked "Manchester" on the map in your recent quinquenniel report is in fact Liverpool, but we'll forgive you for that.) True, Manchester cannot offer the elegant splendours of an historic capital city, nor the dreaming spires of an ancient university town, but there are good reasons for coming to Manchester.



Manchester University

A new home for the Royal Greenwich Observatory? At the moment, Manchester is third in the pecking order

First, you will be firmly seated right in the heart of a big and important university, yet distinct from it. You may know that over the years many astronomers felt that the RGO had grown distant from the community it served. Now we can welcome you back. You will be among colleagues from Jodrell Bank, the university's astronomy department and the University of Manchester Institute of Science and Technology, not to mention astronomers from other northern universities and polytechnics.

Secondly, you must have quick and easy access to the La Palma Observatory. On a recent visit to us, your director was pleasantly surprised to find Manchester International Airport, with its direct flights to the Canary Islands, less than 20 minutes drive from the university.

Thirdly, if the RGO and the universities are to work together, you must be in a place where people can reach you. Apart from the airport, we have motorways north to Scotland, south to the Midlands, London and the South West, east to Yorkshire and west to Wales. Rail links are fast and frequent. Everyone will find Manchester's Piccadilly station a good deal more convenient than Polegate station, near Herstmonceux.

The university has already found you a home. Not quite a castle, I'm afraid, but the next best thing—the old Science Library. This Victorian stone building forms one side of the Old Quadrangle which it shares with the university's administrative departments. The quadrangle is so classy that only the big knobs are allowed to park there.

There will be room in this building and elsewhere on the campus for all your departments, including the library, archives, Nautical Almanac Office and time service. (Already local people are talking of GMT as Greater Manchester Time!)

You will be able to call upon expertise in whatever specialist fields you require, from microelectronics to the conservation of manuscripts. Our Regional Computer Centre has the only university super-computer outside London. And if you eventually wanted a new building there is a vacant plot beween the physics department and the computer centre.

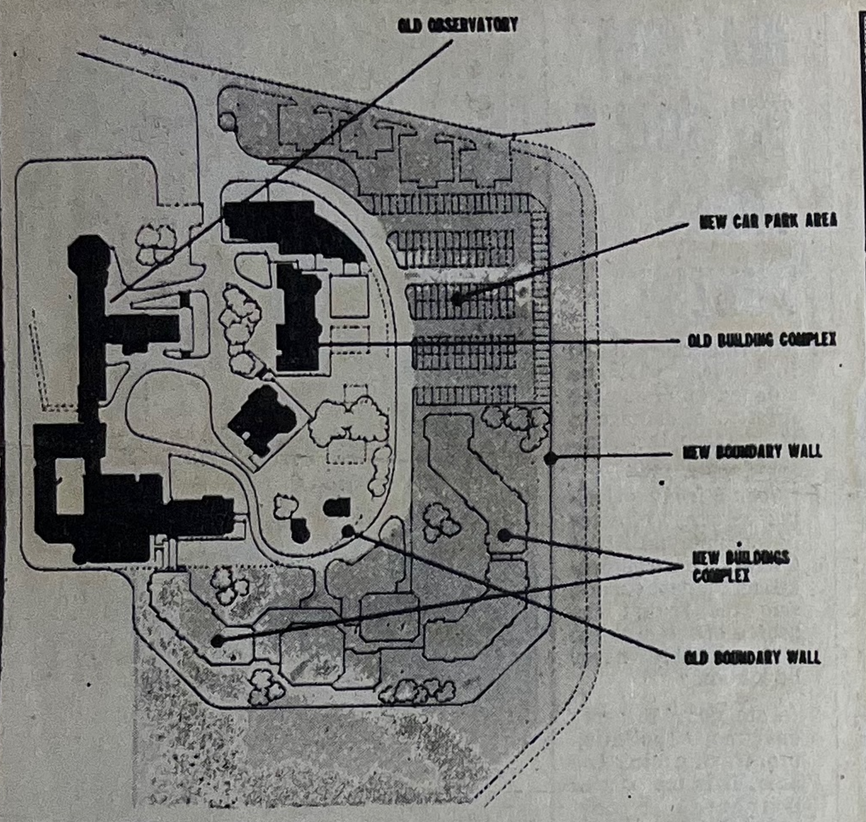
It looks as though you will lose your remaining telescopes. This is sad, because they still have a role to play in testing instruments. I know the decision is out of your hands, but if you really wanted to bring one or two of them with you there is plenty of room at Jodrell Bank. Still, that's between you and the SERC.

But what about your staff? Where do they want to live? Smart city flats? Semis in leafy suburbs? Cottages in the country? Those who pine for the Sussex countryside will find Cheshire every bit as beautiful. One thing is sure, wherever your people live now they will live better up here. Houses are so much cheaper than in the South East.

Manchester City Council has voted to welcome you to the city. Liberal councillor David Sandiford (who is a lecturer in physics) says the vote was unanimous, "a rare event these days". You will find a warm, northern welcome in Manchester and a lively curiosity about your work (we get 80 000 visitors a year at Jodrell Bank alone). Moreover, you will be the first national institution to be set up in Manchester. You can help us to redress the balance between North and South, and show that national laboratories do not have to be tethered by apron-strings to London.

One more thing. If you do come to Manchester, we want you to come soon. Already, many of your staff have left for more secure jobs elsewhere. We don't want you to wait around while you lose even more. We need them to help make Manchester a regional and national centre of excellence in astronomy—as Cambridge already is. □

Tony Jones works at the Nuffield Radio Astronomy Laboratories, Jodrell Bank.



THE ROYAL Observatory on the Blackford Hill showing the proposed development.

A BIRD'S-EYE view showing the splash of threatened green belt around the Observatory.

A hush-hush bite out of the Green Belt . . .

By JAMES CRUMLEY

AN APPLICATION by the Royal Observatory for outline planning consent to expand their operations on Blackford Hill could well create a unique Edinburgh controversy. It is a development as vital for the future of the Observatory — itself at risk from rationalisation plans for all UK observatory work — as it is omnious to those who cherish Edinburgh's open spaces. Ahead lies a classic green belt clash of interests with the intriguing added ingredient that the development could only proceed if the district council sell off two acres of prime public parkland.

BLACKFORD HILL may be an Edinburgh landmark, but it is designated countryside in the gospel according to the Countryside Commission for Scotland.

Certainly, there are few times and places like a glowing autumn afternoon on the summit to appreciate the intimate relationship between town and and countryside, which is one of the most appealing and enduring saving graces of life in a city the size of Edinburgh.

An unbroken wedge of burnished copper countryside spills south across the Hermitage and the Braid Hills to the Pentlands and beyond.

It's value may be measurable more in intangibles than pounds or votes — although it is safe to say that if the council decided to sell it off to private developers they could name their price, and if they did they wouldn't have a vote left on two or three adjacent square miles.

It was, however, those intangibles rather than its potential resale value which prompted the town council of 1894 to buy the hill. That they remain as valid is reflected in the Countryside Commission for Scotland's interest in establishing a country park around Blackford Hill and the Hermitage of Braid.

That airy wedge offers a secret passage which lures wildlife into the woody cloisters of the Hermitage, and a psychological sightline to the wider world beyond for hundreds of urban dog walkers and fresh air swiggers a day. It is a place to draw breath, to pause, to stand and stare. As such, it is an endangered species.

The gnawing jaws of green-belt-crazy developers were never hungrier, and they will take no little comfort from the ambitions of the Royal Observatory on Blackford Hill to develop two more acres of the hilltop.

The Observatory came to Blackford Hill from Calton Hill in 1895 when the corporation sold the Crown three acres for £294, and there it has remained ever since, hemmed in by their own substantial boundary wall. Now, however, the Observatory finds itself at something of a crossroads in its history in a two-horse race with Greenwich for the plum role as solitary home base for a scatter of outposts around the world.

While the Observatories' parent body, the Science and Engineering Research Council, deliberates the respective fates of Blackford Hill and Greenwich, Blackford Hill has adopted attack as the best form of defence. In the words of the Observatory secretary, Mr Bennet McInnes, "We are faced with a choice between decline and growth. We are going for growth."

Going for growth means applying for "the biggest development we could possibly foresee over the next 50 years," which in turn means asking Edinburgh District Council for two more acres of the hill.

The fact that outline planning permission has been granted suggests that the district council are not opposed at least to the idea in principle, which comes as something of a surprise from councillors who have practised and preached the "improving services" aspect of their twin philosophies as diligently in the field of recreational facilities as anywhere.

Recreational facilities do not come much more valuable and irreplaceable than Blackford Hill. The council declined several opportunities to comment.

CONTRIBUTION

By the time the road to the radio station is realigned and the car park readjusted, the affected area will double the size of the existing observatory ground. If you choose to consider the acreage involved as a fraction of the park and the Hermitage together, it is very small.

If you choose to consider it as a precedent-establishing affliction on a piece of parkland bought specifically for the recreational pursuits of the public, and which is also both classic green belt and officially designated countryside, it assumes dimensions which no discussion on mere acreage can satisfy.

There have been a few — very few — public comments to the principle of encroachment into the park (although the announcement of an outline planning consent is such a sotto voce occasion that very few of the public are informed enough to comment).

"Our response," says Mr McInnes, "would be that we will improve the amenities on the hill.

They have, however, shown scant interest in the comments of the Cockburn Association which they invited then rejected out of hand.

Oliver Barratt, the association secretary, commented: "We would not want to lose the Observatory's role from Edinburgh, so we accept the need for development. But you cannot hide a skyline building, so why try? Our suggestion was to build higher, build something bold which people will really want to look at, but contain the development within the existing wall."

The Observatory's response was: "As far as possible we took account of what they said, but we could not accept the suggestion by the Cockburn Association that we try to crush the new buildings into the present observatory area."

That leaves the vexed question of money. Edinburgh District Council have made no secret of their intention to sell some of the city's assets to make ends meet, and there is no question that on the open property market two acres of Blackford Hill would make a sizeable contribution towards solving anyone's capital debt.

Besides, the Observatory is looking for the same kind of give-away deal they secured in 1895 — a few thousand rather than a few hundred thousands.

For the moment, the whole scheme hangs on the outcome of the Science and Engineering Research Council's findings, which should be made known in January.

"We have been granted outline planning consent, and we are holding it at that point," said Mr McInnes. "The crunch will come when we apply for detailed planning permission. Then we will anticipate a debate."

The question is — in the public interest rather than everyone else's, shouldn't th debate come first?

TOMORROW: KEEPING THE PUBLIC INFORMED