THE MESSENGER

EL MENSAJERO

ESO

Munich

La Silla
La Serena
Santiago

No. 24 – June 1981

The Inauguration of the ESO Headquarters Building at Garching

The European Southern Observatory was formally founded on 5 October 1962 when the Convention was signed by Belgium, France, Germany, the Netherlands and Sweden, soon to be followed by Denmark. For many years, ESO was located partly in Geneva and partly in Hamburg. This split of the organization made the management difficult. About five years ago, the German government offered to construct a building for ESO on the campus of the Max-Planck Society at Garching near Munich. The administration immediately moved from Hamburg into provisional offices at Garching and about six months ago, after completion of the new building, the European centre of ESO found its final home.

The great variety of facilities which had to be incorporated into this one building confronted the architects, Hermann

(Continued on page 2)

Dr. F. J. Strauss giving his address during the inauguration ceremony.

The First Steps of the European Organization

Charles Fehrenbach

Prof. Charles Fehrenbach, Member of the French Academy of Sciences and Director of the Haute-Provence Observatory, has been involved since the beginning with the genesis of ESO. He has been kind enough to write a short history of these early developments which are probably unknown to all the young European astronomers now using the ESO facilities and to many of the less young ones.

At the time when Italy and Switzerland are going to join the ESO astronomical community, it is interesting to relate the history of the beginnings of our organization.

It will be mainly anecdotal for the exact history is well recounted in the ESO bulletins and in an article by J. Oort published in the ICSU journal (vol. 3, pp. 30–35).

I was happy to be a party to all the first meetings, except for one or two preliminary ones, as a deputy to A. Danjon who I later replaced in the Council. I was chairman of the Instrumentation Committee for more than ten years. So I am well acquainted with these beginnings.

The idea of building a European observatory in the southern hemisphere was proposed by J. Oort and W. Baade as early as 1953 and they were able to convince P. Bourgeois, A. Danjon, O. Heckmann and B. Lindblad to share this idea.

The first informal meetings were also attended by A. Blaauw and, for a while, by the Astronomer Royal, Sir H. Spencer Jones, and by S. H. Bannier, Director of the Dutch Scientific Research Organization and his Swedish colleague, Dr. G. W. Funke.

(Continued on page 4)

The Inauguration of the ESO Headquarters Building at Garching

(Continued from page 1)

Fehling and Daniel Gogel from Berlin, with a complexity of problems. The most important elements were:

- Work-rooms for about 40 scientists
- Various data processing installations
- A library
- Photographic laboratories
- Laboratories for the development of telescopes and instruments
- Offices for the administration section

It was of course thought desirable that all areas should have their individual identity, where specialists could work undisturbed. On the other hand, however, close collaboration between the various disciplines was considered fundamental.

The architects brief was to build a scientific centre, their aim was to make it "habitable". They had to contend with the flat expanse of fields around Garching, the incomprehensible arbitrariness of the "nuclear-egg" neighbourhood, and their own creation – the Max-Planck Institute for Astrophysics – which was already under way when they received the commission for the ESO building. Today this building, of a very unusual appearance, reflects the architects' conviction, namely that of carrying through the concept from the interior rather than clinging to the image of a house.

The design is extremely successful. A short period of familiarization was needed during which everybody lost their way during a few hours or a few days in what, at first sight, looks like a labyrinth of the kind used to test the intelligence of rats. But human beings are on average cleverer than rats and the problem is quickly solved; after a while it appears that everybody found the building to be very convenient and a pleasant place to work in.

On Tuesday, 5 May 1981, the inauguration of the new headquarters took place in the presence of the President of the Federal Republic of Germany, Karl Carstens. The ceremony was attended by more than 200 invited guests, diplomatic representatives, administrators and scientists of the ESO and other countries, including Italy and Switzerland which are expected to join the organization within a few months.

In his welcoming address, the Director-General, Prof. L. Woltjer, stressed that one of the main aims of ESO was to promote cooperation in astronomical research. He expressed the feeling that, although important results have been achieved in this respect, more can be done.

Prof. R. Lüst, President of the Max-Planck-Gesellschaft, exposed his satisfaction in seeing ESO located in the immediate neighbourhood of the three Max-Planck Institutes at Garching, the Institute for Astrophysics, the Institute for

The new ESO headquarters building at Garching. Note that this picture was not taken on the day of the inauguration, but earlier in the winter.

The President of the Federal Republic of Germany, K. Carstens, is greeted on his arrival at the ESO building by Profs. L. Woltjer, R. Lüst and J.-F. Denisse.

Extraterrestrial Physics and the Institute for Plasmaphysics, all of which are devoted at least partly to Astrophysics. He thought that this proximity would be beneficial to all of them.

E. Stahl, Parliamentary Secretary of State with the Federal Minister for Research and Technology, expressed his satisfaction with this example of a successful European cooperation and his hope that also Austria would join the organization.

Dr. F. J. Strauss, Prime Minister of the Free State of Bavaria, voiced his contentment to see such a research centre as ESO near Munich, which has always been a cultural centre. He said that, in his opinion, the economical survival of the European countries which are lacking raw materials and energy sources has to be based on creativity and on intellectual effort.

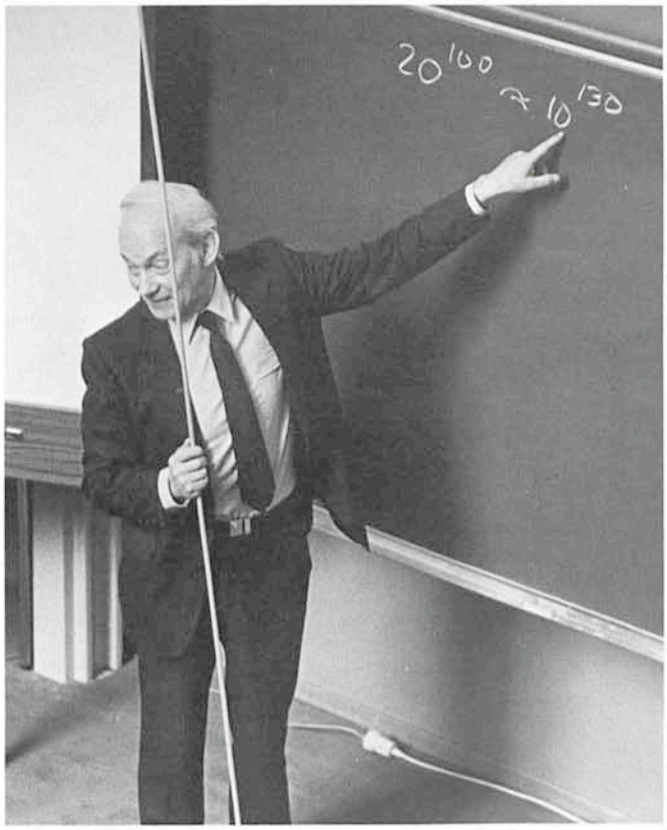
Prof. J.-F. Denisse, President of the ESO Council, briefly related the history of ESO, and said that this venture is now a success and that this is due for a large part to the excellent and energetic management of the present Director-General. He added that this success would be more complete if Great Britain was joining ESO, but this possibility in his opinion is unfortunately small.

After the opening ceremony, a lunch was offered by the President of the Federal Republic of Germany, during which he delivered an address; he welcomed ESO, its collaborators and their families to Germany, the host country. He was thanked by Prof. Denisse.

In the evening, a reception was offered by the Bavarian State Government to participants and their spouses.

The afternoon and the following day were devoted to a symposium on the "Evolution of the Universe". The six talks are listed below:

- "Space Sciences and Geosciences: Evolution of Two Interactive Fields of Knowledge" by Prof. H. Curien, President of the French Centre National d'Etudes Spatiales.
- "The Evolution of the Solar System" by Prof. H. Alfven, Nobel Prize in Physics (1970).
- "The Early Evolution of Life on Earth" by Prof. M. Eigen, Nobel Prize in Chemistry (1967), Director of the Max-Planck Institute for Biophysical Chemistry in Göttingen.
- "Particle Physics in the Early Universe" by Prof. L. van Hove, former Research Director-General at CERN.
- "The Evolution of Large-Scale Structures in the Universe" by Prof. J. H. Oort, former Director of the Leiden Observatory.
- "Evolutionary Aspects of the Cosmic Black Body Radiation" by Dr. D. W. Sciama, Fellow of All Souls College in Oxford.



Prof. M. Eigen during his talk.

The remarkable talk by Prof. M. Eigen opened new windows on a field quite unfamiliar to most of the audience.

In spite of the extremely bad weather experienced on the first day, all participants were pleased with the perfection of the organization of these events, and left Munich with the feeling that ESO is now a grown-up and efficient organization.

P. V.

The First Steps of the European Organization

(Continued from page 1)

These preliminary and very informal meetings lasted for seven years for, if agreement among the astronomers was immediate, that of the government authorities was difficult to get. In France, for instance, a vote by the Parliament was necessary. Such commitments were essential to ensure proper subsequent support and financing. Some of the arguments were trifling and were the cause of long delays: everybody agreed on the principle of sharing the expenses and on the aims of the observatory, but it was impossible to reach an agreement on one expression, "le coût des facteurs", which the French authorities rejected as being incomprehensible but which the others did not want to change . . .

Nevertheless, the definitive convention was signed in Paris on October 5, 1962, by five countries: Belgium, France, Germany, the Netherlands and Sweden. The Ford foundation had promised and indeed paid on September 21, 1964, a grant of one million dollars. Denmark joined only later, but attended, as an observer, a number of meetings.

But, these seven years were not lost.

First, the choice of a site occupied a number of young European astronomers in South Africa where the search zone was located, between latitudes –26° and –34°, from Johannesburg to Capetown. This zone was quickly restricted to the region of Great Karoo and west of it. If I recall now these campaigns of site searching, I am struck by our lack of knowledge on the conditions required for good seeing, for, if meteorological statistics gave accurate information on the number of hours of clear sky, our ideas on atmospheric turbulence were very rudimentary. We tried to measure or to estimate the seeing on the Karoo plateau. But we were not aware that good images were associated with small diurnal atmospheric temperature variations which are found above the inversion layer at about 2000 to 2400 meters elevation. Such a small thermal variation is moreover essential for the smooth working of a large telescope.

In my opinion, this fact excluded all the sites we studied in South Africa, including the one supported by the French group in Zeekoegat. It would however be dishonest to say that there were no other reasons for forsaking South Africa.

During these bad years (1953–1960), the United Kingdom definitely withdrew from this project and the French authorities did not feel themselves to be very much involved. The French delegation was not any more authorized to participate, but the astronomers did not want to give up the project and they thought of building a French station for studying the Magellanic Clouds, the operation of which would be in the framework of ESO. A. Danjon got the funds enabling the Marseille Observatory to build a 40 cm objective prism telescope, its dome and its auxiliaries. The travel expenses and the per diem were paid by ESO for testing the Zeekoegat station where French astronomers built and used this instrument from 1958 to 1966. I cannot cite the names of all the pioneers who lived there in quite difficult conditions, and of the resident astronomers who subsequently enjoyed much better conditions. I wish to thank here all of them, for it is thanks to them that the project was not given up.

Our radial velocity measurement staff brought back from all these stays several lasting impressions: the beauty of the country, the enthusiastic and always kind welcome from the population, but also an uneasy feeling in spite of our excellent relationship with all the ethnic groups, but we did not have to form an opinion on this problem.

How many pleasant recollections: like the edict that I had to issue to limit the proliferation of donkeys on our station, our South African employees measuring their standard of living by the number of their donkeys!

From the astronomical point of view, we made good observations, but thermal variations were strongly disturbing, particularly as the large ESO 40 cm Objective Prism seems to be more sensitive to temperature changes than that of the Haute-Provence Observatory.

These searches for a site did not reach a conclusion, but by a dramatic turn, our American colleagues form AURA had decided to build an observatory in Chile and they had studied a site near La Serena (Tololo) and, according to their investigations, it was much better than our African sites.

Professor O. Heckmann, who was the director of the organization as well as being in charge of the Hamburg Observatory, paid a visit, together with J. Rösch, to our American colleagues in Chile and came back so strongly convinced that the Council sent, in June 1963, a few Council members to study the problem on the spot. I was amongst them. We first visited, on horseback, the American site at Tololo. Our colleagues offered us an adjoining site at Morado, but we preferred to have our own site to preserve our

independence. After a survey of the maps to identify the land belonging to the State of Chile and an exploration with a helicopter of the Chilean army, we chose an area 100 km north of La Serena. After two or three days on horseback, we picked out a summit which was called Cinchado; however, because this name was widespread, O. Heckmann suggested instead the name La Silla (the saddle) which has been adopted.

O. Heckmann signed a convention with the Chilean government in November 1963 which displeased some of our diplomats who, however, adopted this very advantageous convention. The Council finally decided the installation on La Silla in 1964.

The site began to be investigated in 1963, especially by A. B. Muller who devoted all of his time to Chile.

The buying of a guest-house in Santiago, at a very favourable time, is of great help and considerably facilitates the transit from Europe to La Silla. If our American colleagues sometimes call it the "Petit Trianon", it is perhaps because they envy our luck!

During this time, the preparation of the observing instruments, telescopes and accessories was undertaken by Professor O. Heckmann, assisted by Professor J. M. Ramberg and by an Instrumentation Committee of which I was the chairman for more than ten years.

In order to quickly give an effective scientific life to the observatory, it was decided to build three telescopes of intermediate size; the conception and building of a Schmidt telescope were entrusted to Germany. We chose the same focal length as that of the Palomar Schmidt, 3.05 m, but a diameter of 1 m for the corrector to provide good images over the whole spectral range from 330 to 700 nm. The construction of the optics, mirror and corrector, as well as the mechanical building were much delayed and the corrector, achromatized for too large a wavelength, is not excellent in the ultraviolet. A number of small difficulties delayed the commissioning of this large southern Schmidt telescope.

The 1.52 m telescope was originally a copy of the Haute-Provence Observatory telescope and should have had only a coudé focus. At the last minute, it was decided to change the initial plan by making a hole in the mirror and installing also a Cassegrain focus.

The building of a photometric 1 m telescope was also decided as well as the transfer to La Silla of the Large Objective Prism telescope installed in South Africa.

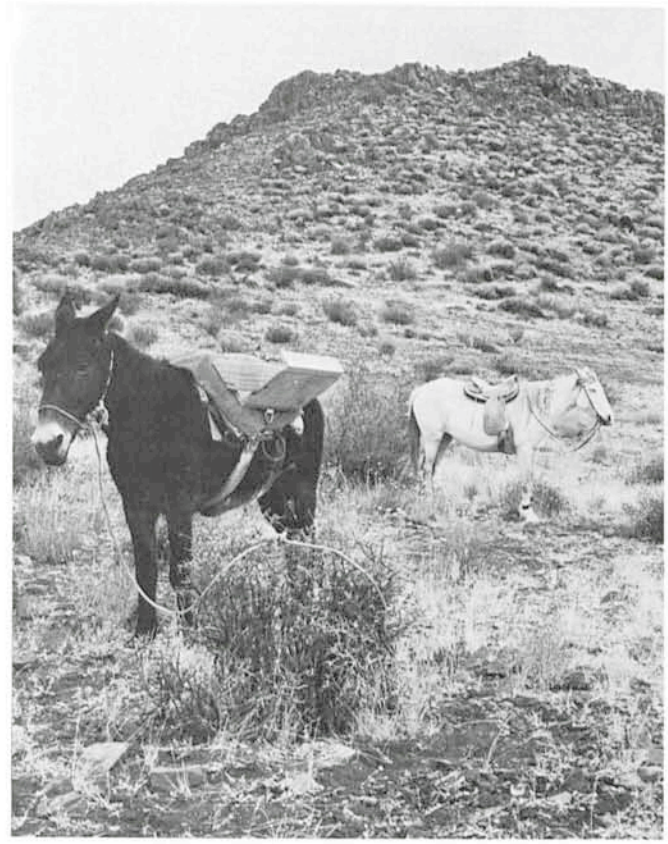
The conception of the large telescope met many difficulties. The convention had planned a 3 m telescope. A study trip by some of us to the Lick Observatory, however, showed that the building of an observing cage in a tube of such a diameter was difficult and the astronomers succeeded in convincing the whole Council of the need to increase the telescope diameter to 3.5 m.

The choice of the optical parameters and then that of the support system of the main mirror caused a number of difficulties. In the French astronomical community, there was some opposition for reasons more sentimental than real, to the Ritchey-Chretien system (how difficult it is to be a prophet in your own country! . . .) and to a mirror with a f/3 aperture.

Nevertheless, a final agreement was reached on all the points and especially on the mirror support, at least partially thanks to important meetings organized under the auspices of the IAU on large telescopes and mirror support systems.

In the mean time, it had become possible to obtain a 3.6 m blank of fused silica; a thickness of 50 cm was chosen (in spite of A. Couder's idea of making a thinner mirror). This blank weighs more than 12 tons.

Negotiations were started with the only two American suppliers able to deliver such a blank, and the Corning Corporation was chosen.



The only available transportation to reach La Silla in 1963.

The melting and cutting of this huge mirror did not proceed without difficulty – the first melting was defective for the blank, made of polygonal prisms melted together, was covered with a single bubbleless layer. This had subsided during melting and, at the first cutting, the concavity of the mirror entered into the internal layer and the blank, accepted with reserves, had to be sent back to the United States. The upper layer was cut out and replaced by a new one.

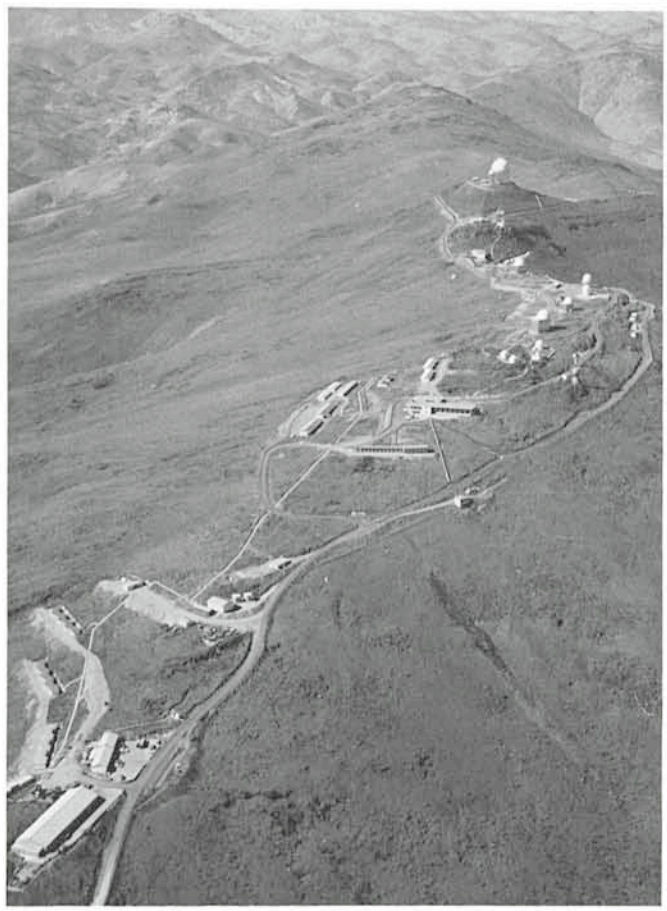
But we were dogged by ill luck as, during heating, one of the protecting silica bricks was, by mistake, replaced by a glass brick and the blank, when it came out of the oven, had a hole of about 10 cm. Thanks to the know-how of REOSC and especially of its director, A. Bayle, it was possible to cut out a hemisphere at the location of the hole and to fill it, with optical contact, with a silica hemisphere.

Cutting this mirror posed another problem. None of the European manufacturers was equipped for figuring a mirror of the size and we seriously thought of installing an optical laboratory in France.

The contacts we had with European companies lead to the signing of a contract with REOSC, a French company in Paris. The Instrumentation Committee was sometimes blamed for having defined insufficient image quality specifications, but the contract made provision for an additional clause for improving the figure of the mirror if that turned out to be necessary. The collaboration between the German (H. Köhler, G. Schwesinger) and the French (A. Couder, A. Baranne) opticians was very fruitful and the final quality of the mirror was such that all reserves, often ill considered, were forgotten.

The choice for the type of mounting was, after many discussions, of an intermediate type between a cradle mounting and a fork mounting. The design of this system was entrusted to an excellent German engineer, W. Strewinsky, but almost without any project office and without signature of a formal contract.

La Silla, October 1966 . . .



. . . and La Silla today.

The main weakness of our organization then appeared very clearly: the absence of a project office with engineers and technicians devoting all of their time to the study of the instruments, the preparation of the demands for tender, the choice of the manufacturers and the supervision of the work.

A small group of astronomers and a few administration staff were very busy during the creation of the organization.

The Instrumentation Committee tried in vain to act as a project office but it had neither the means, nor the abilities to do so, in spite of all the individual willingness.

The creation of a project office was then envisaged, but it was already late; fortunately, at the initiative of the French delegation and especially of Mr. M. Alline, representative of the French Ministry of Foreign Affairs, contacts were established with the CERN Director-General, then the late Professor B. Gregory. They led to the creation of a project office for the organization, located in Geneva and strongly supported by the large CERN design departments.

There is no doubt in my mind that it was the installation in Geneva which saved our organization. The efforts of the successive Directors-General, Professors O. Heckmann, A. Blaauw and L. Woltjer, who devoted all their time to ESO, were of course essential.

The initial project for the large telescope was completely revised by this project office, under the direction of S. Laustsen. We should not, however, forget the role of other colleagues, especially of J. M. Ramberg.

The large telescope suffered serious delays, due partially to this lack of a project office, but also to the scattering of the services: in Europe, Hamburg and Geneva, without mentioning the small Marseille group; in Chile, Santiago, La Serena and also La Silla!

This was ungovernable, in spite of all the willingness of the Director in Hamburg and Geneva and of B. Westerlund in Chile.

Particularly, the three centres in Chile were the cause of endless travelling by the personnel from the mountain to La Serena and to Santiago.

For a time, evil tongues were saying that Astronomy was an alibi for the administration.

These circumstances are now out of date. La Silla is the heart of our organization – the transfer from Geneva to Munich, regretted by some, including myself, will certainly be beneficial.

This article has been originally written in French; the editor takes full responsibility for the poor translation.

FAINT OBJECT CAMERA BOOKLET

"The Faint Object Camera for the Space Telescope" booklet is now available to qualified scientists free of charge. This booklet describes the technical and operational characteristics of the FOC which is the European contribution to the instrument complement on the Space Telescope. In addition, the booklet describes various possible scientific programmes which should be feasible with the FOC. Interested persons should write to ESA at the following address:

ESA Information Retrieval Service
8–10, rue Mario-Nikis
F-75738 PARIS
France

P. C.
