EUROPEAN SOUTHERN OBSERVATORY

ANNUAL REPORT 1967

Organisation Européenne pour des Recherches Astronomiques
dans l'Hémisphère Austral

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ANNUAL REPORT 1967

Hamburg-Bergedorf
1968

This Report was approved by the ESO Council
in March 1968

CONTENTS

A. INTRODUCTION

The more important events of the year 1967 may be summarized as follows: Denmark entered the Organization. Belgium, already an active member of the Organization, ratified the Paris Convention of 5 October 1962.

Building activity on La Silla and near Santiago continued throughout the year.

Various observing programs were carried out with the 1 m Photometric Telescope in its provisional building.

The 1.52 m Spectrographic Telescope was completed. It will be transported to Chile during the first half of 1968.

The mechanical design of the 3.6 m Telescope was advanced sufficiently to allow the architectural planning to start.

The Council agreed that, under certain conditions, instruments which are not international property of ESO, but national property of an ESO Member State, may be installed on La Silla.

B. LEGAL MATTERS

The supplementary convention between the Chilean Government and our Organization with the aim of protecting ESO's scientific activity against interference from new mining interests was ratified by both Houses of the Chilean Parliament and became law with the publication in the Diario Oficial. The corresponding change in Art. 17 of the Chilean Mining Law (cf. Ann. Rep. 1965, B 4, and Ann. Rep. 1966, B) will not be dealt with by the Chilean Parliament before 1968.

The measuring of the area in which ESO has applied for its own mining rights has been completed. The deeds have been registered and the greater part of ESO's property is now reasonably protected. It is, however, necessary to have a specialized lawyer constantly looking after the interests of ESO with regard to possible claims from third parties.

During the year ESO obtained from the Chilean Government the right to use diplomatic bags in mail traffic between Santiago and the Office of the Director. This system is now working satisfactorily.

The final water rights in the Quebrada Pelícano were granted. In addition, ESO has applied for water rights at the well of Puquíos. If ever water supply difficulty is experienced at Pelícano, the latter source would be available. It lies at a higher altitude than La Silla.

Water rights for the irrigation of the garden area around the Headquarters Building in Vitacura will be applied for as soon as the various technical matters have been clarified.

The final building permit concerning the present construction on La Silla was obtained.

Official permission was granted to ESO to use its own short-wave radio system between La Silla, La Serena and Vitacura as announced in the Diario Oficial.

Completion of negotiations with the Empresa Nacional de Telecomunicaciones (ENTEL) (cf. Ann. Rep. 1966, p. 10) awaits clarification of various minor legal and technical details. We hope to sign the contract during 1968.

The eventual legal steps to be taken in case ESO wishes to construct an airfield in the fiscal area between the Carretera Panamericana and the Quebrada Pelícano have been studied and prepared by our lawyers.

Other legal matters in connection with buildings and instruments will be mentioned below in their appropriate context.

C. BUILDING ACTIVITY

1. Road Construction

During 1967 the Chilean Government awarded a contract to the firm of Figueroa y Alemparte for the layout and construction of a public road from the Carretera Panamericana to Camp Pelícano to replace the old road, the latter being unsuitable for the transport of heavy and delicate instruments. ESO contributed one third of the cost of the new road, which is 14 km long and 6 m wide. Completed in May, it is maintained by the ESO Technical Department with its own labour and equipment (grader, bulldozer, vibrating road compacter, and tank-truck).

ESO's own road from Camp Pelícano to La Silla was continuously maintained. The general condition of the road after the 1966/67 winter was good.

Our consulting engineers prepared plans for a new road from the instrument shoulder to the highest peak at 2.444 m, where the 3.6 m telescope building is to be erected. The bid of the firm of Figueroa y Alemparte was accepted. By the end of 1967 the excavations for the road and the platform were completed. The surface construction will continue in 1968.

The new road makes not only the main summit accessible but also the lower one and the south shoulder.

2. Power, Water, Sewage, Heating

During 1967 a second 115 kVA ASEA generator arrived and was erected by the firm of Schwarze under the supervision of ESO's Technical Department. From now on the 42 kVA and the 9.5 kVA generators will be used only as stand-by sets.

About two years ago, in connection with the camp construction on La Silla, ESO erected an electrical network on metallic poles. The strong winds of both 1966 and 1967 together with snow and ice produced frequent cable breaks and short-circuits. As a consequence, the entire network was put underground in PVC tubing.

The high-tension line from the power station in Camp Pelícano to La Silla, which together with a low-tension telephone cable is mounted on wooden poles high above the ground, also suffered from the storms in winter 1967. Responsibility for the line rests with our consulting engineers and the firm of Ovalle. The contractual repairs will be carried out in the near future.

Water supply was maintained without major difficulties. The average daily amount taken from our wells steadily increased. It was about 50 cubic metres in January and 83 cubic metres in December.

The exterior lines of the hot water heating as well as the power lines of the TECSA buildings were completed and connected.

The exterior sewage lines for the five telescope buildings, not included in the contract with TECSA, were constructed by the firm of Schwarze. About 80 per cent of the works was completed, tested and accepted in 1967. The remainder will be completed early in 1968.

The central heating plant on La Silla, including the installation of the necessary equipment and boilers, was completed.

3. Camps

In Camp Pelícano, various smaller additions became necessary: a gate-keeper's house to control the ingoing and outgoing traffic, alarm bells together with a complete fire-fighting system, first-aid huts, automatic pumps for the gasoline filling station, etc.

An important improvement was the provisional installation of a magnetic telephone system between Camp Pelícano and Camp La Silla.

In their spare time our labourers erected at Camp Pelícano a clubhouse for their social activities and built a floodlit football field.

To the Camps of Pelícano and La Silla a third one was added in 1965. It was first used to accommodate labourers of the firms of Schwarze (road construction) and Ovalle (power and water lines). After some improvements, it is now used by the auxiliary staff required by the firms of Seibert (domes) and Bildeve (elevators). It was given the name Campamento Beño.

4. Buildings on La Silla

During 1967 the building of the 1.52 m Spectrographic Telescope was completed; the dome was erected and painted, and about 50 per cent of its electrical installation was carried out. The interior insulation will be ready in January 1968.

The buildings for the 1.00 m Photometric and Schmidt Telescopes were 90 per cent completed and both domes erected. The work on the building for the 0.40 m Objective Prism Astrograph was started again after a lengthy interruption. It will be ready for the instrument early in 1968.

The building for a 0.60 m telescope of the University of Bochum was completed. Its 4 m Ash-dome will be assembled in the near future.

Due to the fact that most of TECSA's labour was put on to the spectrographic telescope building to ensure its early completion in 1968, the hostel suffered some delay but is now expected to be ready by the middle of 1968.

5. Headquarters Building in Santiago

Construction started at the beginning of the year but soon fell behind schedule. By the end of the year, however, all concrete work had been completed. In October the installation of the air heating and ventilation ducts was started. All other installations and surface finishing have been left for 1968.

The basic steel structure for the building of the Mechanical Laboratory next to the Headquarters building was ready in December.

6. Communication System

A very simple but, at this stage of our project, sufficiently reliable radio network was installed during the year to connect La Silla and La Serena with Santiago. In Santiago the Observatorio Nacional kindly gave permission to erect a simple relay station on Cerro Calán.

The system at the end of 1967 was as follows:

From	*to*	*Frequency*	*Watts*
La Silla	Pelícano	166.95 Mc	6
La Silla	Coquimbo	166.95 Mc	6
La Silla	La Serena	170.20 Mc	60
La Silla	Cerro Calán (Santiago)	7560 Kc	100
Cerro Calán	Office Santiago	170.20 Mc	60

The small radio equipment installed in 1965 was also in use throughout the year and proved to be still indispensable. Its data are given in the first and second line of the table.

D. FUTURE CONSTRUCTIONS AND INSTALLATIONS

1. Building for the 3.6 m Telescope

With the consent of the Council, a contract was signed with the firm of Lenz Architekten + Ingenieure for the design, preparation of tender documents, and supervision of the work in Chile of the building of the 3.6 m Telescope. On this occasion we preferred to have one firm responsible for these activities.

The intersection of the α and δ axes of the telescope will be 25 metres above the surroundings. The building will have a 30 by 32 metres ground plan and will be crowned by a dome of 30 metres diameter. A principal characteristic will be two huge coudé laboratories in a 5th floor below the observing floor.

2. Dormitory

The architectural design for a 20 units dormitory to be built not far from the hostel was started by the firm of Sentab. An earlier design for a rather small building was cancelled two years ago.

3. Residences

As it was decided in 1965 that ESO had to provide living accommodation for families on La Silla, a careful appraisal of numerous makes of prefabricated houses led to an order being placed with N. V. Nederlandse Metaalindustrie Polynorm, Bunschoten, Holland.

4. Communication System

The negotiations with ENTEL (Empresa Nacional de Telecomunicaciones) were continued throughout the year. The contract when concluded will give ESO two ultra high-frequency channels connecting La Silla and Santiago, one for telephone, a second for telex. The second one will also allow connection of digitized equipment at La Silla with a future electronic computer at Headquarters.

E. DOMES

Of the three domes of the Photometric, the Spectrographic, and the Schmidt Telescope, the second one was assembled first and was inspected in the Seibert Sécométal Works by the ESO representatives early in the year. Its appearance and functioning were good. The wind-screen was not yet attached. As the other two domes are of the same design, it was not thought necessary to assemble them completely for inspection at the maker's works. They were instead transported to Chile where assembly started in August. By the end of the year the second dome was ready and the two others were nearing completion. Acceptance of the three domes will take place in March 1968.

Experience with the three smaller domes made it advisable to prepare not only an exact list of requirements for the big dome of the 3.6 m Telescope but also to prepare an almost complete predesign. Only then would an invitation to tender produce really comparable offers. It was thought best to order the predesign from the firm of Seibert Sécométal (Saarbrücken) because it was the opinion of both the Management and the Instrumentation Committee that their experience with the smaller domes would soon lead to satisfactory results. This predesign will be completed early in 1968. The idea of giving the big dome a self-supporting ribless structure was again accepted. The main difference in the basic design will be a windscreen system combined with the shutter. The main additions internally will be a big crane bridge and the platform for the exchange of the prime focus elements. It is thought necessary to make provision for a possible cooling system for the interior; if the insulation is good, a comparatively small cooling capacity will be sufficient.

F. INSTRUMENTS

a) Prism Astrolabe

The instrument worked to our full satisfaction (see G 2 below).

b) Objective Prism Astrograph

The mechanical parts of the instrument remained stored in Campamento Pelícano throughout the year.

The optical parts will be sent to Chile together with the optics of the Spectrographic Telescope by the firm of REOSC.

c) Photometric Telescope

The instrument was in permanent use throughout the year. Difficulties with the frequency standard causing errors in the guiding of the telescope were overcome by the electronics engineer M. Becker, Santiago, until it was overhauled by the maker, Weseman, Rotterdam. Temperature sensitivity especially had to be eliminated. After the unit had been returned and installed again, it worked satisfactorily.

The photoelectric photometer lent to ESO by the Kapteyn Observatory in Roden, Holland, was in May replaced by the ESO photoelectric photometer by M. de Vries and C. J. W. Mulder of the Kapteyn Observatory. At the end of 1967, after reduction of observations, it became clear that the photometer can still be slightly improved.

d) Spectrographic Telescope

The optics of the telescope were almost completed during 1967. The primary mirror was tested at the works of REOSC in January. Its parabolic shape was achieved to an accuracy better than 1/5 of a wave-length. The two secondaries in combination with the primary mirror were installed in the mounting of the French twin-telescope in Haute Provence and tested on the sky in July. The star images in both foci are good. The Foucault knife-edge tests proved satisfactory. A little retouching near the edge of the secondaries might still improve the optical performance of the combination. This, however, can be done in Chile during the final optical adjustment.

The completely assembled telescope was demonstrated to the ESO astronomers in December and operated well. Final acceptance of the instrument will take place in Chile. The telescope is being packed and will be ready for shipment early in 1968.

The coudé spectrograph is approaching completion. All mechanical parts are ready and only a few optical elements remain to be finished. The delivery of the complete spectrograph is expected in July 1968.

Baranne in Marseille designed a spectrograph with an échelle grating to be used at the Cassegrain focus of the telescope.

The first instrument of this type was constructed for the Observatoire de Haute Provence. It will be tested in 1968 at the ESO Spectrographic Telescope in Chile and may, if satisfactory, be bought by ESO.

e) Schmidt Telescope

The spherical mirror was almost completed late in 1967. At the same time the work on the Schmidt lens was nearing completion. The material for the objective prism was ordered from Schott, Mainz.

The mechanical design has progressed sufficiently to allow a contract to be signed with the Hamburg machine-tool firm of Heidenreich & Harbeck for the construction of the mechanical parts of the Schmidt Telescope. They made the fork mounting of the Hamburg 80/120/240 cm Schmidt Telescope which proved to be very satisfactory.

f) 3.6 m Telescope

On February 23 the acceptance of the silica disc produced by Corning took place in their plant at Bradford, Pennsylvania. ESO was represented by Ch. Fehrenbach, O. Heckmann, J. Texereau, and J. Espiard, engineer of the firm of REOSC. Texereau and Espiard measured the internal stresses all over the disc and found them unusually small. A memorandum on the results of their work is given in ESO Bulletin No. 2. Texereau expressed the opinion that he had never seen a disc of comparable quality.

In order to avoid difficulties near the rim of the disc, Corning had made the disc somewhat larger than necessary. The unexpected high quality of the enlarged disc permitted a gain of an additional small zone of 5 cm width. With the consent of the Council it was decided to give the free aperture of the instrument a diameter of 3.60 m instead of 3.50 m. The small changes in the overall design were carefully traced throughout the instrument to keep all focal ratios unchanged.

The central hole in the disc was fixed at 0.70 m.

The negotiations with REOSC led in June 1967 to the signing of a contract by which the firm will process the primary mirror, two secondaries and three flats. The firm will also deliver the cells for all these elements.

The silica disc was transported from Bradford via New York — Le Havre to the REOSC workshop in Ballainvilliers near Paris. Considerable enlargements of their premises had to be made, including a vertical test duct in a steel tower and a horizontal test room. A grinding machine for mirrors up to 4.00 m diameter was ready late in December. The work on the disc began immediately.

In Hamburg the design work of W. Strewinski was steadily progressing. With the consent of the Instrumentation Committee a strong fork mounting was accepted. It gives the horseshoe zone a comparatively small diameter. It was aimed to keep the tube weight to the minimum, and to this

end it was decided not to store the various exchangeable prime focus elements (observer's cage and secondaries) in the tube but to put them on a platform a the lower edge of the rotating dome. An exchange of two parts A (in the tube) and B (on the platform) is made in the horizontal position of the telescope tube: at first, an empty sector is offered to the telescope and part A taken on the platform, then part B is offered to the empty tube and taken into the tube. As far as possible the procedure will be made automatic.

The north (lower) end of the polar axis of the instrument will be below the sixth (observing) floor in the fifth floor. There, the coudé light cone will be reflected by a „wobbling" mirror (the 3rd flat) into various fixed directions where different spectrographs up to collimator lengths of 24 m may be installed. It is planned to use the eastern laboratory space for fixed equipment, the western for experimental work.

The observer near the Cassegrain focus will ride with the instrument in a half-spherical cage which is fixed to the strong central part (cradle) of the tube. The mirror cell, however, will provide for the immediate fixation of spectrographs or other apparatus up to a weight of about 2 tons.

It is planned to ask for tenders of the first parts of the mounting in mid-1968.

Together with Strewinski, the astronomers of the Management and the Instrumentation Committee made various studies on the operational aspects of the whole design.

A new idea (brought to our attention by G. Herbig) will be incorporated in the design; this is a comparatively small (0.95 m aperture) auxiliary telescope which allows stars to be observed in one of the large spectrographs while the main telescope is used in the prime or in the Cassegrain focus. Thus it will increase the time efficiency of the spectrographs considerably. The auxiliary telescope will be in a fixed horizontal position and will receive its light from a one-mirror siderostat of 1.47 m diameter. The CERVIT discs for the additional optics have been ordered from Owens, Illinois.

g) Instruments for Evaluation and Measurement

Following the working scheme explained in the 1966 Report (p. 13 g) a first list of simple instruments was prepared by the Management and agreed upon by the Instrumentation Committee. The instruments were ordered late in 1967. For the more sophisticated instruments, with digital output and automatic operation, proposals have been worked out by the Management, but these need further investigation.

After consulting numerous experienced astronomers in France, the Netherlands and West Germany, electronic equipment for the laboratories on La Silla and in Santiago was agreed upon by the Instrumentation Committee; the equipment was ordered before the end of the year.

h) Aluminizing Plants

The Edwards aluminizing plant was accepted on 11 January. It was shipped from Liverpool to Chile on 8 December, where it will be assembled in its special room in the Spectrographic Telescope Building.

Further negotiations with European firms on the design and construction of an aluminizing plant for the 3.6 m mirror were postponed until the design of the building to house this instrument is more advanced.

G. SCIENTIFIC ACTIVITY

1. Meteorology and Seeing

Meteorological conditions were good, although not as good as in 1966. The numbers of photometric clear nights in 1966 and 1967 were 252 and 239 respectively. The numbers of observed clear hours differed only slightly, i. e. 2481 for 1966 and 2412 for 1967 out of a total of 3681 possible observing hours. As in 1966, exceptionally good weather was experienced in January, February and March with 85 clear nights out of a total of 90 nights.

Apart from the existing 24 m high meteorological mast which was installed in 1966, a second mast was erected at the lower summit. Erection of this mast was delayed due to weather conditions and technical trouble with the Sanborn recorder. When it was ready, however, observations had to be postponed due to road construction activity with unavoidable blastings, but it is hoped to have the second mast in regular use early in 1968. Both masts serve to measure the atmospheric temperature fluctuations at various heights above the surrounding ground.

The complete meteorological results gained on La Silla during 1967 will be published in a forthcoming number of the ESO Bulletin.

CARSO continued seeing observations at La Silla with an Automatic Seeing Monitor (ASM) until September. Although CARSO intended to carry on a few months longer, observations had to be stopped due to the above-mentioned construction work near the top of La Silla.

It is now apparent that seeing conditions at Cerro Morado and Cerro La Silla are practically the same and that the turbulences are smaller than those observed at Californian observatories.

J. B. Irwin has published the results of CARSO's observations in Chile in No. 3 of the ESO Bulletin. A preprint of his report appeared in the publications of the Steward Observatory in Tucson, U. S. A.

In September a 15 cm photoelectric telescope was installed on the second summit near the second meteorological mast. This instrument, which is also used for instructing Chilean night assistants, is used for a special program of continuous measurement of atmospheric extinction. Again due to road construction and blasting, the measurements had to be interrupted for a few weeks. The telescope was moved to a safe site where observations could

be continued. During the short period of observations it was noted that the atmospheric extinction was remarkably constant. Results will be published in the ESO Bulletin.

2. Astronomical Observations

a) Prism Astrolabe (Cerro Calán)

According to the agreement between ESO and the Universidad de Chile (cf. Ann. Rep. 1965, p. 10), the observational program for the Danjon Prism Astrolabe at the Observatorio Astronómico Nacional on Cerro Calán progressed throughout 1967.

During the year under review 246 fundamental series and 119 catalogue series were observed. Some results concerning systematic errors of the FK 4 catalogue deduced from the observations made during 1966 were communicated to Commission 8 at the 13th IAU Meeting in Prague, 1967. The results in time and latitude were sent to the Bureau International de l'Heure (Paris) and to the International Polar Motion Service (Japan).

The general results in time, latitude and zenith distance obtained during the first year of observations as well as the list of the fundamental star groups were published during 1967 in No. 3 of the „Publicaciones" of the Departamento de Astronomía, Universidad de Chile.

b) Photometric Telescope

J. P. Brunet continued his program on stars in the Magellanic Clouds till May. M. de Vries and H. C. D. Visser started a photoelectric program on stars in the Scorpio Centaurus Cluster and other B-type stars in May with the ESO photometer. In September and October M. de Vries together with J. Wijnbergen successfully observed a test program in the infra-red with a special photometer of the Kapteyn Observatory. Subsequently, a program of faint G- and K-type giants, supervised by A. Blaauw, was carried out by S. Baas and T. van't Foort with the ESO photometer. During the last two full moon periods of 1967, the telescope was used by J. Stock and E. Mendoza of the Observatorio Nacional of Cerro Calán for their own programs also with the ESO photometer.

3. Publications and Library

During 1967 the following publications appeared:

Annual Report for 1966.
Astronomical Site Testing in South Africa
edited by the Committee for Site Testing under
supervision of Dr. U. Mayer, Tübingen 1967.
Bulletin No. 1 and No. 2.

The manuscript of Bulletin No. 3 was sent to the printers.

The steel shelving for the libraries in Santiago and on La Silla were ordered from the firm of Pohlschröder, Dortmund.

H. ORGANIZATION

1. Office of the Director

A. Behr of Göttingen and S. Laustsen of Brorfelde joined the ESO Management on 1 July and 1 December respectively as part-time consultants for instrumentation and construction.

On 31 October H. O. Voigt, assistant director for construction, left ESO upon termination of his contract. In view of his age he wished to return to Europe after having assisted ESO in the difficult tasks of the first stage of construction in Chile.

On 1 August Raúl Villena, a Peruvian civil engineer, joined the staff to replace H. O. Voigt as chief engineer in Chile.

F. Middelburg joined ESO on 1 April to commence duties as night assistant at La Silla.

During 1967 the books of the Organization over 1966 have been audited and found to be correct.

It was decided that an internal auditing system should be organized. For this purpose the services of the firm of Accountantskantoor T. Keuzenkamp, Amsterdam, were contracted as from the year 1967.

The Bundesrechnungshof will make the final report as before.

2. Organization in Chile

A. B. Muller remained in charge as superintendent of ESO's activities in Chile.

The Organization remained in 1967 as shown on the organigram in the Annual Report 1966, p. 27.

Raúl Villena took over as chief engineer from H. O. Voigt as from 1 October (see H. 1 above).

During the year under report, the administration department increased considerably due to more intense general building activity. The construction of the domes, lifts and movable platforms started in mid-1967 and involved an additional increase in administration, organization of board and lodging, imports, transport, etc.

Consequently, the local staff and labour increased from 77 to 93.

Due to continuing inflation in Chile, local salaries and wages had to be increased by 12 per cent in July. Further increases must be expected early in 1968.

The transport department has been improved and reorganized. For the bigger vehicles (trucks and larger cars) only Chevrolets, and for the smaller vehicles Volkswagen (station wagon 1600 and Kleinbus), are now used. For the trucks and larger cars one and the same type of motor is installed in order to simplify the stocking of spare parts.

A Chevrolet bus has been obtained for the transport of our men between La Serena and the site. Three new small trucks and three VW mini-buses have been put into service. Two small trucks were sold after three years severe service.

The car repair shop has been brought up to a standard which will enable us to do most repairs in Pelícano. Two additional mechanics had to be engaged.

Because of many different small works and constructions, the purchasing section has been very busy during the year and could in general supply all requirements in spite of the frequent shortages in Chile. More important items had to be imported from abroad. In general, imports were cleared through the customs with little delay. At the beginning of the year, the introduction of the GATT system caused some congestion and delay in the already overcrowded ports but there were no detrimental consequences.

Where materials were occasionally damaged they could be repaired locally and the costs could be claimed from the insurers.

3. Marseille

No changes occurred in the office of the Chairman of the Instrumentation Committee.

R. Clop is to be engaged as from 1 January 1968 as instrumental engineer to assist Ch. Fehrenbach in his tasks as Chairman of the Instrumentation Committee.

I. ESTIMATED AND ACTUAL EXPENDITURE

The estimated expenditure in the 1967 ESO budget compares as follows with the actual expenditure for 1967:

Budget Items Amounts in 1000 US $	Budget 1967	Expenditure 1967
I. Capital Expenditure		
A. Land, Buildings, Roads	1 867	1 998
B. Instruments	934	813
C. Consultants and Architects	217	228
TOTAL CAPITAL EXPENDITURE	3 018	3 039
II. General and Overhead Expenses	668	660
III. Astronomical and Meteorological Activity, South Africa	—	—
IV. Astronomical and Meteorological Activity, Chile	70	23
V. Maintenance Roads, Buildings and Instruments	10	10
Unforeseen	30	4
TOTAL, INCLUDING EXPLOITATION	3 796	3 736

The total expenditure up to 31 December 1967 can be summarized as follows:

Budget Items Amounts in 1000 US $	Total Expenditure up to 31. 12. 1967
I. Capital Expenditure	
A. Land, Buildings, Roads	4 464
B. Instruments	2 460
C. Consulting Engineers and Architects	975
TOTAL CAPITAL EXPENDITURE	7 899
II. General and Overhead Expenses	1 975
III. Astronomical and Meteorological Activity, South Africa	501
IV. Astronomical and Meteorological Activity, Chile	108
V. Maintenance Roads, Buildings and Instruments	56
Unforeseen	40
TOTAL EXPENDITURE	10 579

The total budget for 1968 has been fixed at US $ 3 342 000 detailed as follows:

Budget Items Amounts in 1000 US $	Budget 1968
I. Capital Expenditure	
A. Land, Buildings, Roads	1 221
B. Instruments	570
C. Consulting Engineers and Architects	270
TOTAL CAPITAL EXPENDITURE	2 061
II. General and Overhead Expenses	1 107
III. Astronomical and Meteorological Activity, South Africa	—
IV. Astronomical and Meteorological Activity, Chile	112
V. Maintenance	32
Unforeseen	30
TOTAL BUDGET 1968	3 342

Hamburg-Bergedorf, March 1968 O. Heckmann

K. APPENDICES

1. Members of the ESO Council during 1967

Belgium:	A. G. Velghe
	M. Deloz
Denmark:	A. Reiz
	O. Obling
France:	Ch. Fehrenbach
	R. Poussard
Federal Republic of Germany:	H. H. Voigt
	K. F. Scheidemann
The Netherlands:	J. H. Oort
	J. H. Bannier
Sweden:	C. Schalén
	G. Funke (President)

Meetings:
1 June 1967 in Hamburg.
1 December 1967 in Hamburg.

2. Members of the ESO Committees and Working Groups as at 31 December 1967

ESO Finance Committee

Belgium:	M. Deloz
Denmark:	O. Obling
France:	J. Bourreau
Federal Republic of Germany:	W. Paulig
The Netherlands:	J. H. Bannier (Chairman)
Sweden:	B. Samuelsson

Meetings:
3 May 1967 in Hamburg.
21 November 1967 in Hamburg.

ESO Instrumentation Committee

Belgium:	R. Coutrez
	M. V. Migeotte
	L. Neven
Denmark:	B. Strömgren
France:	A. Couder
	G. Courtès
	Ch. Fehrenbach (Chairman)

Federal Republic of Germany:	A. Behr
The Netherlands:	Th. Walraven
Sweden:	A. Wallenquist

Meetings:
2 May 1967 in Hamburg.
18 December 1967 in Hamburg.

ESO Sub-Committee for Spectrographs

Belgium:	M. V. Migeotte
France:	R. Bouigue
	M. Bretz
	Ch. Fehrenbach (Chairman)
Federal Republic of Germany:	H. H. Voigt
	P. Wellmann
The Netherlands:	A. B. Underhill
Sweden:	B. Edlén (Consultant)
	Y. Öhman (Consultant)
U. S. A.:	I. S. Bowen (Consultant)

Meeting:
21 December 1967 in Marseille.

ESO Working Group for Buildings

Belgium:	J. Dommanget
Denmark:	A. Reiz
France:	P. Lacroute
Federal Republic of Germany:	O. Heckmann (Chairman)
The Netherlands:	A. Blaauw
Sweden:	E. B. Holmberg

Meeting:
19 December 1967 in Hamburg.

ESO Scientific Programs Committee

(confirmed by Council on 1 December 1967)

Belgium:	P. Swings
Denmark:	B. Strömgren
France:	J. Delhaye

Federal Republic of Germany:	G. Traving
The Netherlands:	Th. Walraven
Sweden:	E. B. Holmberg

ESO Working Group for Colloquia

Belgium:	L. Neven
	L. Houziaux (Substitute)
France:	R. Cayrel
Federal Republic of Germany:	U. Haug
	T. Herczeg (Substitute)
	O. Heckmann (Chairman)
The Netherlands:	A. B. Underhill
	H. G. van Bueren (Substitute)
Sweden:	T. Elvius
	G. Larsson-Leander (Substitute)

ESO Committee for Study of the Results of the Site Tests

Belgium:	J. Dommanget
France:	Ch. Fehrenbach
	J. Rösch (Chairman)
Federal Republic of Germany:	H. Scheffler
The Netherlands:	A. Blaauw
Sweden:	E. B. Holmberg

ESO Working Group for Publication Matters

Belgium:	A. G. Velghe
France:	P. Lacroute
Federal Republic of Germany:	O. Heckmann (Chairman)
	H. H. Voigt
Sweden:	G. Funke

3. Employees on Contract with ESO as at 31 December 1967

Hamburg Office:

O. H. L. Heckmann	Director
J. M. Ramberg	Assistant Director
J. Bloemkolk	Manager
F. Dossin	Astronomer

J. Meuser	Chief Purchasing and Shipping
H. W. Marck	Accountant
B. Wächter	Librarian
E. Görner	Secretary
G. A. M. Jacobse	Secretary
Ch. Sachs	Secretary

Chile:

A. B. Muller	Astronomer and Superintendent
H. O. Voigt (until 31. 10. 1967)	Assistant Director for Construction
R. Plentl	Administrator
R. Villena (as from 1. 8. 1967)	Chief Engineer
R. H. G. Holder	Resident Engineer
H. E. Schuster	Assistant Astronomer
F. Middelburg (from 1. 4. 1967)	Night Assistant
H. J. Straatman	Assistant Administrator
J. Doornenbal	Mechanic
A. Bosker	Storekeeper-Chief Transport

France:

O. Vincent	Secretary

4. Local Staff and monthly paid Labour in Chile as at 31 December 1967

Astronomical Department

A. Cuthbert T.	Secretary
J. Palisson B.	Meteorological Assistant
R. Cortés C.	Night Assistant
R. Vega T.	Night Assistant
B. Melys R.	Assistant Mechanic

Administration Department

S. Baquedano	Assistant Storekeeper
J. Briggs	Bookkeeper and Purchasing Officer
H. Carrasco P.	Camp Boss
J. Díaz A.	Driver
C. Euler	Secretary, Santiago
M. Felis K.	Secretary, La Serena
E. Figueroa G.	Assistant Storekeeper
H. Flores M.	Driver

F. Gómez C.	Radio Operator, La Silla
A. González T.	Driver
C. Herrera V.	Bookkeeper, La Serena
S. Lazo	Kitchen Supervisor
A. Montalván	Mechanic Car Workshop
N. Navea Z.	Driver
V. Navarrete	Bookkeeper, Santiago
T. Nettle A.	Assistant Storekeeper
G. Pietropaolo	Office Boy, Santiago
J. Ponce A.	Driver
G. Prado P.	Driver
J. Piatek	Driver
L. Ramos A.	Driver
C. Pizarro	Guesthouse Supervisor
A. Rozas L.	Transport Foreman
M. Schlichter	Chief, Office La Serena
C. Smilović	General Office Clerk, La Serena
A. Urquiza U.	Personnel Officer, La Serena

Technical Department

A. Anais R.	Crane Driver
G. Díaz A.	Assistant Electrician
P. Döhmer	Secretary, Vitacura
F. Hering G.	Electrician
R. Julián	Assistant Engineer
A. Mondaca R.	Secretary, La Silla
P. Nuñez	Diesel Mechanic
J. Rodríguez L.	Electrician
R. Valenzuela M.	Driver Caterpillar
P. Valenzuela F.	Driver
and 38 labourers	Pelícano / La Silla
4 watchmen	Pelícano / La Serena
4 labourers	Camp Beño
5 labourers	Santiago

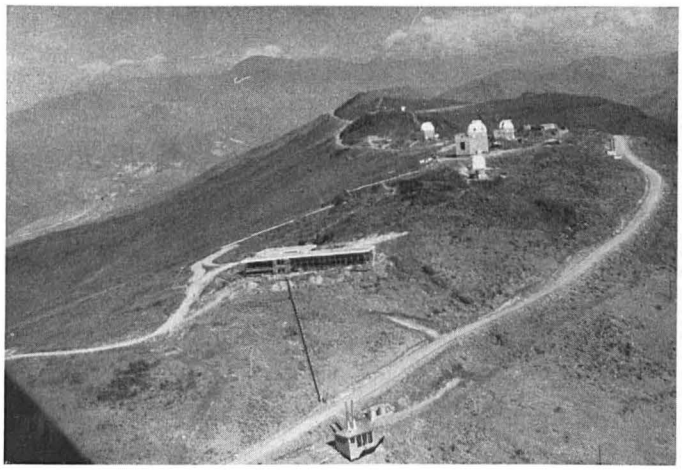

Fig. 1: Air view of La Silla from the west: Heating Plant, foreground. Hostel, centre.

Fig. 2: Air view of La Silla from south-west: Main Summit and Second Summit, right. Schmidt Building and La Silla Camp, near centre. Workshop, left edge.

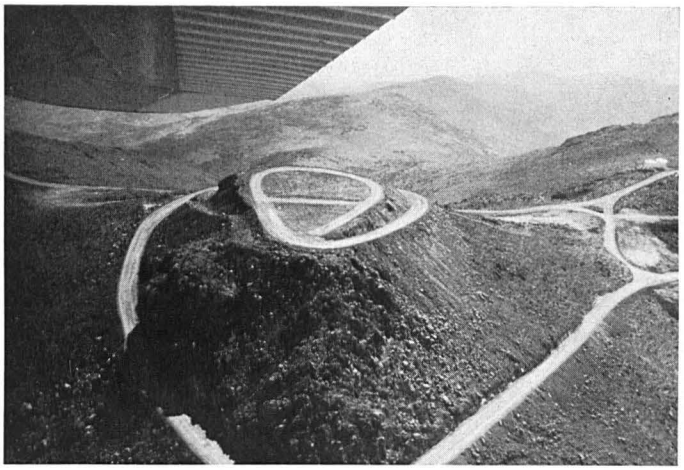

Fig. 3: Air view of Main Summit of La Silla from the east with its access road under construction.

Fig. 4: Hostel on La Silla under construction.

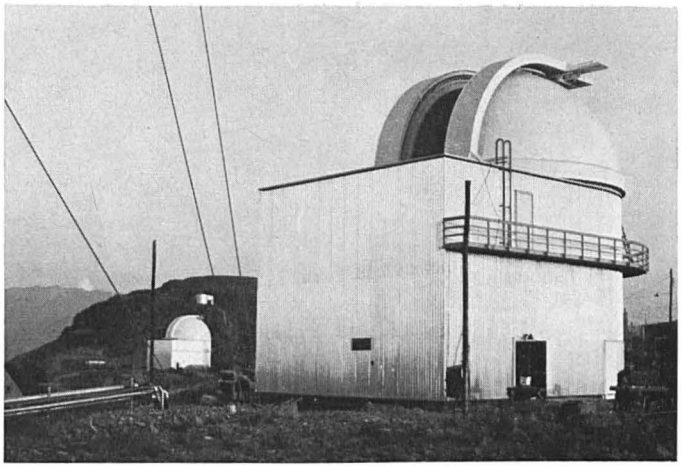

Fig. 5: Building for 1 m Photometric Telescope, foreground. Building for Schmidt Telescope, background.

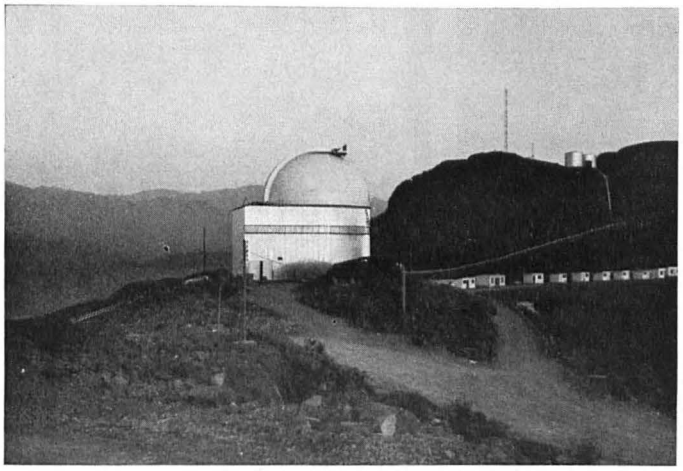

Fig. 6: Building for Schmidt Telescope. In the background, right, part of La Silla Camp and Second Summit with water tanks and 24 m meteorological mast.

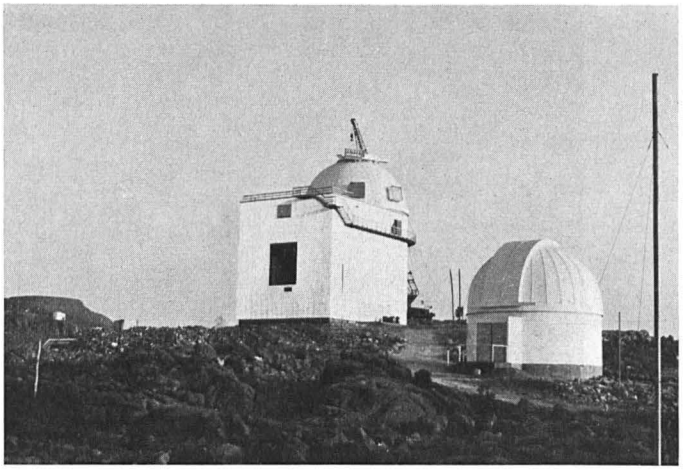

Fig. 7: Building for 1.5 m Spectrographic Telescope, centre. Provisional Building for 1 m Photometric Telescope, right.

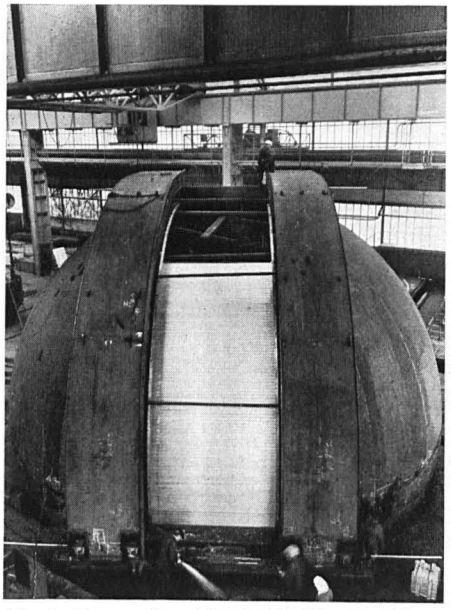

Fig. 8: Dome for 1.5 m Spectrographic Telescope in the Works of Seibert-Sécométal in Saarbrücken. Slit, shutters and wind-screen visible.

Fig. 9: Dome for 1.5 m Spectrographic Telescope in the Works of Seibert-Sécométal in Saarbrücken. Circular holes for large ventilators visible.

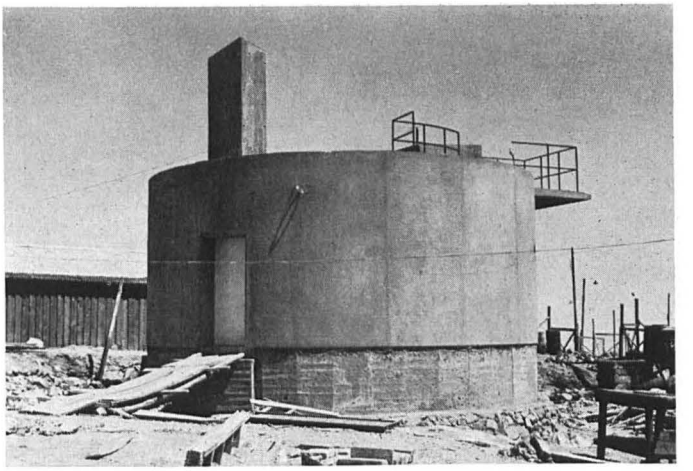

Fig. 10: Building for Astrograph under construction.

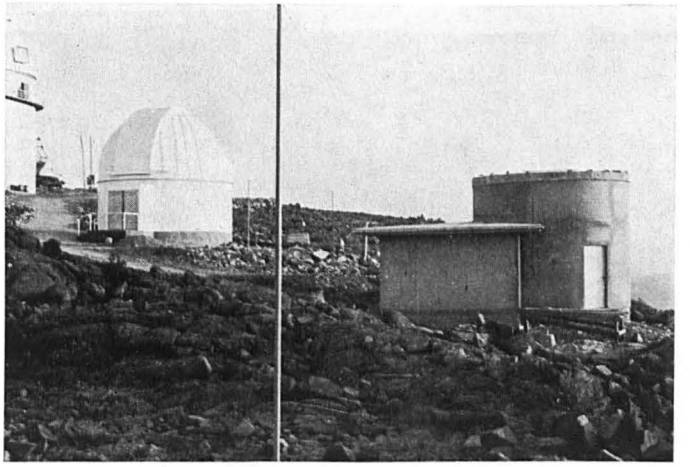

Fig. 11: Unfinished Building for 60 cm Bochum Telescope, right.
Provisional Building for 1 m Photometric Telescope, left.

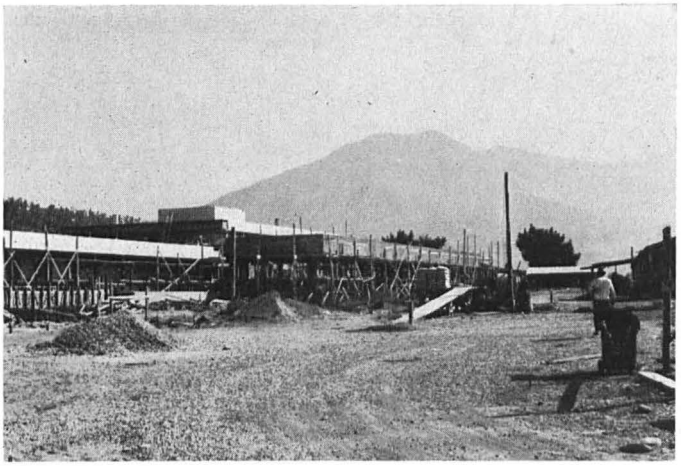

Fig. 16: ESO Headquarters in Santiago: Main Building, northern part of east façade.

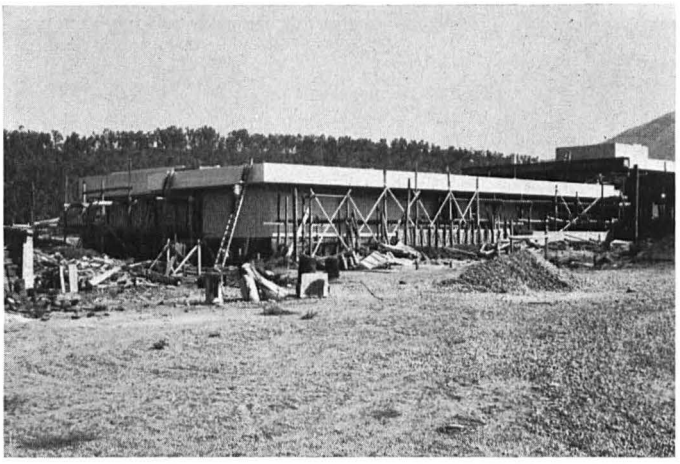

Fig. 17: ESO Headquarters in Santiago: Main Building, southern part of east façade.

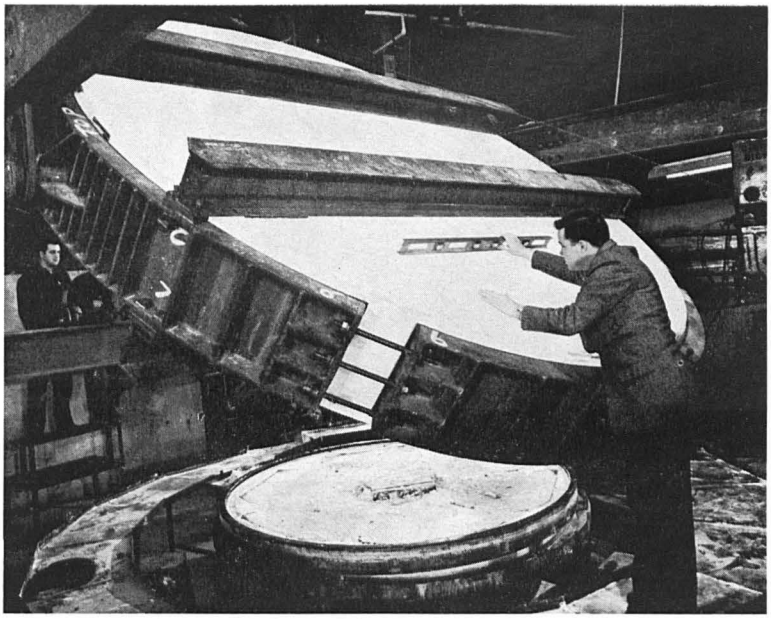

Fig. 18: Silica blank for 3.6 m mirror being tested in the Works of Corning.

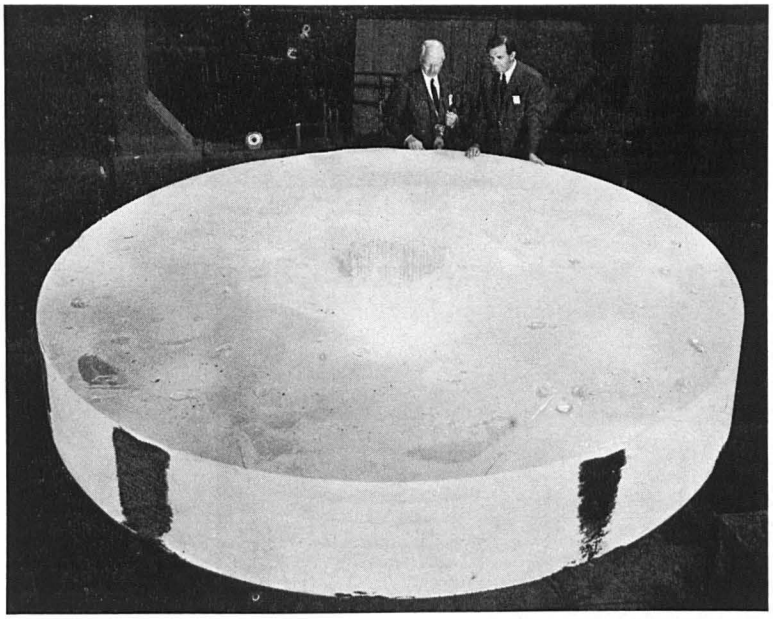

Fig. 19: Silica blank for 3.6 m mirror in the Works of Corning. In the background Dr. Heckmann and Dr. Fehrenbach.

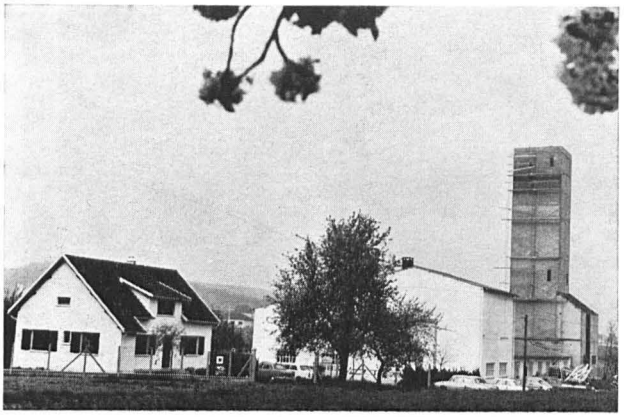

Fig. 20: Works of REOSC at Ballainvilliers near Paris with tower for optical tests under construction.

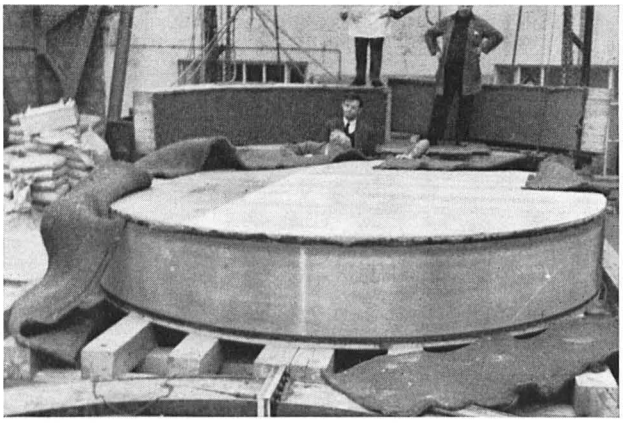

Fig. 21: Silicia blank for 3.6 m mirror being unpacked in the Works of REOSC. In the background Dr. Fehrenbach.

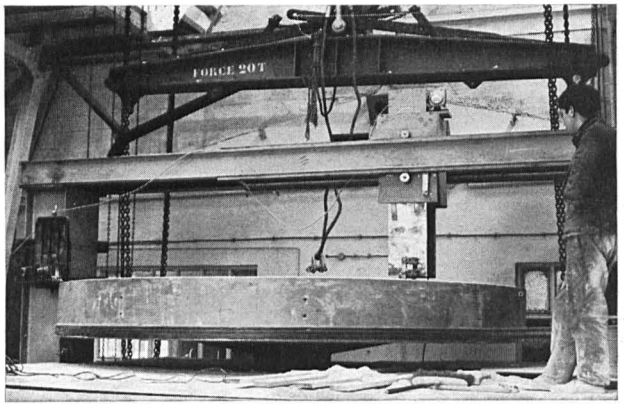

Fig. 22: Table of large grinding machine in the Works of REOSC with arrangements for milling the 3.6 m silica blank.