

ESO'S EARLY HISTORY, 1953–1975

IX. The 3.6-m Telescope Project Division; ESO Collaborates with CERN*

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“---practically everyone [on the CERN Committee of Council] --- emphasized the scientific importance of the collaboration between astronomy and high-energy physics and common technical developments ---”.

From a letter of C.J. Zilverschoon (CERN) to the author of November 27, 1969.

In the second half of 1969, Council and ESO Directorate changed course in the effort to realize the 3.6-m telescope. Within the ESO management, but in close consultation with Council members, collaboration with other scientific organizations or with industry was contemplated as an alternative to relying entirely on the engineering bureau of Strewinski.

ESO Approaches CERN

For several reasons, ESO tended to turn first of all to CERN. CERN developed powerful and sophisticated instrumentation; the scientific, non-profit aims of the two organizations were similar; CERN's Rules and Regulations for personnel and its administrative procedures had served as a model for those of ESO, and as we saw in article I, the ESO Convention had been shaped to a large degree after that of CERN. An interesting and important circumstance was also that for three of the six ESO member states, government delegates in the CERN and the ESO Council were the same person: from the time of the ratification of the ESO Convention in 1964 till the early 1970's, this had been the case for Denmark (O. Obling), the Netherlands (J.H. Bannier) and Sweden (G. Funke). Moreover, the ESO Council members for the Federal Republic of Germany and for France, C. Zelle (from 1970) and A. Alline (from 1969), respectively, had been members for several years of the CERN Finance Committee. Thus, there was much common ground between the governing bodies of the two organizations and ample possibility for informal consultation [1].

Deliberations crystallized at a meeting at CERN on October 21, 1969. Present were from CERN: its Director-General Bernard P. Gregory, the Director of Administration George H. Hampton, and C. (“Kees”) J. Zilverschoon, Head-Engineer associated with the construction of the Intersecting Storage Rings. ESO was represented by Heckmann, Ramberg, Blaauw and Bloemkolk of the Directorate, and Fehrenbach as Chairman

of the Instrumentation Committee. An extensive report on the meeting, dated November 10, 1969, was written by Ramberg [2]. After introductory presentations on general CERN procedures for handling large instrumentation projects and on the current situation of the 3.6-m Telescope Project, possible ways of collaboration were explored. Not only the case of the 3.6-m telescope was considered; reference was also made to the recent proposals of the SPC for three powerful telescopes described in article VII (a large photometric telescope, a “big Schmidt”, and an astrometric telescope).

The most attractive arrangement appeared to be what we shall call the “incorporation proposition”: ESO would create the staff positions that would be required according to CERN experience for a project of the (financial) size of the 3.6-m telescope, and make these available for an ESO set-up at CERN. The group would follow CERN rules and grades and salary scales, and be under the jurisdiction of the Director General of CERN, whereas the ultimate scientific responsibility for the project would remain under the Director General of ESO. The draft organigram proposed at the meeting is reproduced in Ramberg's report. Even farther reaching collaboration was briefly discussed, including the possibility of common research projects and close physical neighbourhood of the two Headquarters. A time schedule was drawn up leading to completion of the telescope project on La Silla about six and a half years after the beginning at CERN. An essential feature of the proposed arrangement would be the continuous availability of CERN expertise – technical and administrative – and even CERN making personnel available to ESO “on loan” for limited periods.

As a first step following the meeting, Ramberg on behalf of the ESO Directorate sent on November 12, 1969 the following telegram to the President of the CERN Council [3]:

“In view of the recent informal discussion between the Director General of CERN and the Director General of the European Southern Observatory, on which occasion a mutual interest in exploring a collaboration between the two organizations was expressed, we re-

spectfully submit for your meeting of the Committee of the CERN Council a request to explore the possibilities for such a collaboration within CERN.”

As the President of the CERN Council, G. Funke, also was a member of the ESO Council (and had been its President over the years 1966–1968!), understanding for the situation could be taken for granted, and the matter was duly submitted to the CERN Committee of Council in its meeting on the next day, November 13. The reaction was very encouraging. In a letter of November 27, 1969 addressed to myself, Zilverschoon informally reported as follows (in translation by me from the Dutch text):

“As you may have heard from Bannier, our Committee of Council has very favourably received the proposition of collaboration with ESO.

It was remarkable that practically everyone --- entirely lost sight of the original aim, the construction of the telescope, and rather emphasized the scientific importance of the collaboration between astronomy and high-energy physics [and] common technical developments such as data handling and the political aspect: formation of a “Communauté scientifique européenne”, in which there would be room also for other organizations for fundamental science. England, too, was quite positive. We expect that our Council in December will approve continuation of the discussion. ---.”

In my reply of December 9, apart from expressing appreciation for the reaction of CERN, I elaborated especially on the prospect of wider scientific collaboration on which I may return in a later article [4]. Kees Zilverschoon, the author of the above letter, would in subsequent years become a devoted counselor to ESO's TP Division.

Consultation with ESRO

CERN was not, however, the only sister organization approached by ESO. The other one was ESRO, the European Space Research Organization, predecessor of the European Space Agency. On November 14, 1969 I visited its Director General H. Bondi at ESRO Headquarters in Paris [5]. Bondi, too, reacted quite positively. However, as

* Previous articles in this series appeared in the *Messenger* Nos 54 to 61.

COUNCIL and COMMITTEE of COUNCIL					FINANCE COMMITTEE			
COU No.	C. of C. No.	Date	Place	President	No.	Date	Place	President
15	1	1970 May 6	Hamburg	J.H. Bannier	17	1970 March 10	Hamburg	C. Zelle
		1970 June 11	Hamburg	J.H. Bannier	18	1970 May 22	Hamburg	C. Zelle
16	2	1970 November 17	Hamburg	J.H. Bannier	19	1970 October 28	Hamburg	C. Zelle
		1970 December 9	Hamburg	J.H. Bannier				
17	3	1971 May 18	Hamburg	J.H. Bannier	20	1971 May 17	Hamburg	C. Zelle
		1971 June 9–10	Hamburg	J.H. Bannier				
18	4	1971 November 12	Geneva	J.H. Bannier	21	1971 October 5, 6, 8	La Silla, Santiago	C. Zelle
		1971 Nov. 30/Dec. 1	Hamburg	J.H. Bannier	22	1971 November 16, 17	Hamburg	C. Zelle
19	5	1972 May 19	Geneva	A. Alline	23	1972 April 11	Hamburg	C. Zelle
		1972 June 8–9	Geneva	A. Alline				
20	6	1972 October 31	Bergedorf	A. Alline	24	1972 October 17	Bergedorf	C. Zelle
		1972 November 17–18, 21, 24	Santiago, La Silla	A. Alline				
21	7	1973 March 29	Paris	A. Alline	25	1972 December 18	Geneva	C. Zelle
		1973 May 18	Geneva	A. Alline	26	1973 April 26	Bergedorf	M. Fehrm
1973 June 5–6	Hamburg	A. Alline						
22	9	1973 November 28	Geneva	A. Alline	27	1973 November 12, 13	Bergedorf	M. Fehrm
		1973 December 13–14	Hamburg	A. Alline	28	1973 December 12	Bergedorf	M. Fehrm
10	1974 March 26	Geneva	A. Alline					
23	11	1974 May 9	Bergedorf	A. Alline	29	1974 June 6	Bergedorf	M. Fehrm
		1974 June 19, 20	Hamburg	A. Alline				
24	12	1974 November 1	Amsterdam	J.H. Bannier	30	1974 October 31	Amsterdam	M. Fehrm
		1974 December 5–6	Hamburg	J.H. Bannier				

space-engineering differs quite a bit from ground-based work in that the requirements for space-proof products make them considerably more expensive than those that, if needs be, can be reached by a ground-based technician, cost estimates soon pushed this perspective for collaboration into the background.

The Documents Cou-59 and Cou-60 of December 1969

Parallel to these talks between ESO and CERN ran consultations between Council and myself as a candidate for the succession of Heckmann in the General Directorate. I had been approached by Council on this matter early in 1969, and this led to a formal offer by the President of Council, J.H. Bannier, of June 30, 1969, containing the following passage: "Council considers the successful construction and erection of the 3.6-m telescope as a priority task of the Organization for the next few years, and would be happy to hear how you think that you can best discharge your

responsibility in this respect. The Council is willing to discuss with you any proposals you would like to make, even if these would imply changes in the structure of, or a different division of responsibilities within, the Organization. Council would be pleased to receive such proposals early enough to be able to discuss them in the meeting of 15 and 16 December 1969." [6].

Half a year later, for this meeting Council had at its disposal two docu-

ments for discussing its policy. One was "The Present State of the 3.6-m Telescope Project" (Doc. Cou-59), compiled by the Technical Director J. Ramberg [7], the other the "Memorandum on Further Development of the 3.6-m Telescope project and on Possible Collaboration with CERN or/and ESRO" (Doc. Cou-60), by myself [8].

Document Cou-59 summarized the situation by the end of 1969, including a breakdown of the cost estimates for the

MEETINGS OF THE INSTRUMENTATION COMMITTEE, 1970 – 1974

No.	Date	Place	President
30	1970 June 2	Hamburg	Ch. Fehrenbach
31	1970 December 1	Geneva	Ch. Fehrenbach
32	1971 March 8	Geneva	Ch. Fehrenbach
33	1971 September 21	Geneva	Ch. Fehrenbach
34	1972 March 28	Geneva	J. Borgman
35	1972 June 6	Geneva	J. Borgman
36	1972 October 3–4	Geneva	J. Borgman
37	1973 February 13–14	Geneva	J. Borgman
38	1973 October 3–4	Geneva	J. Borgman
39	1974 March 27–28	Geneva	J. Borgman
40	1974 October 15–16	Lyon	J. Borgman

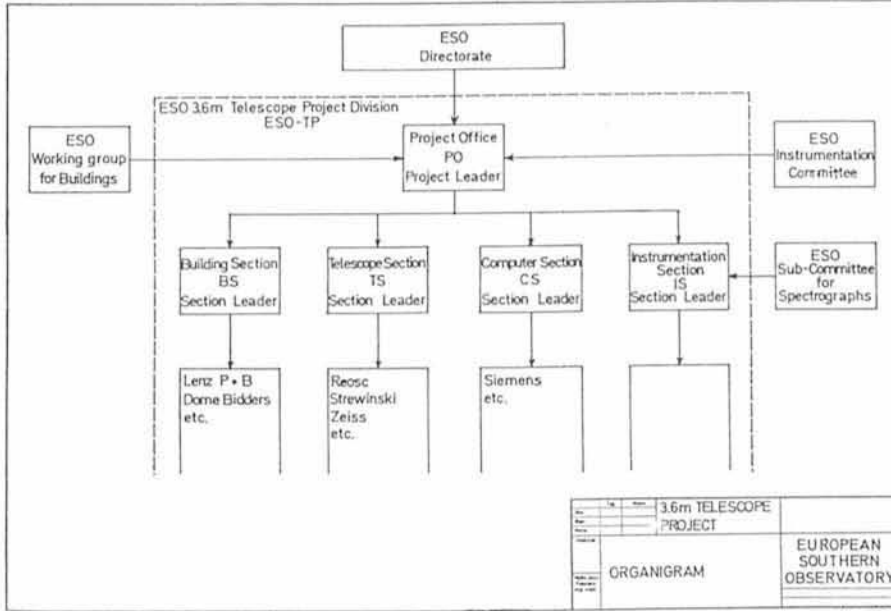
various components of the project. As this situation has been reviewed in the previous article, we need not present here again Ramberg's summary. I shall return to the cost estimates of Cou-59 in article XI.

Cou-60 consisted of three parts. The first part discussed ways of proceeding with the project with special reference to the possible collaboration with CERN, the second part discussed further as-

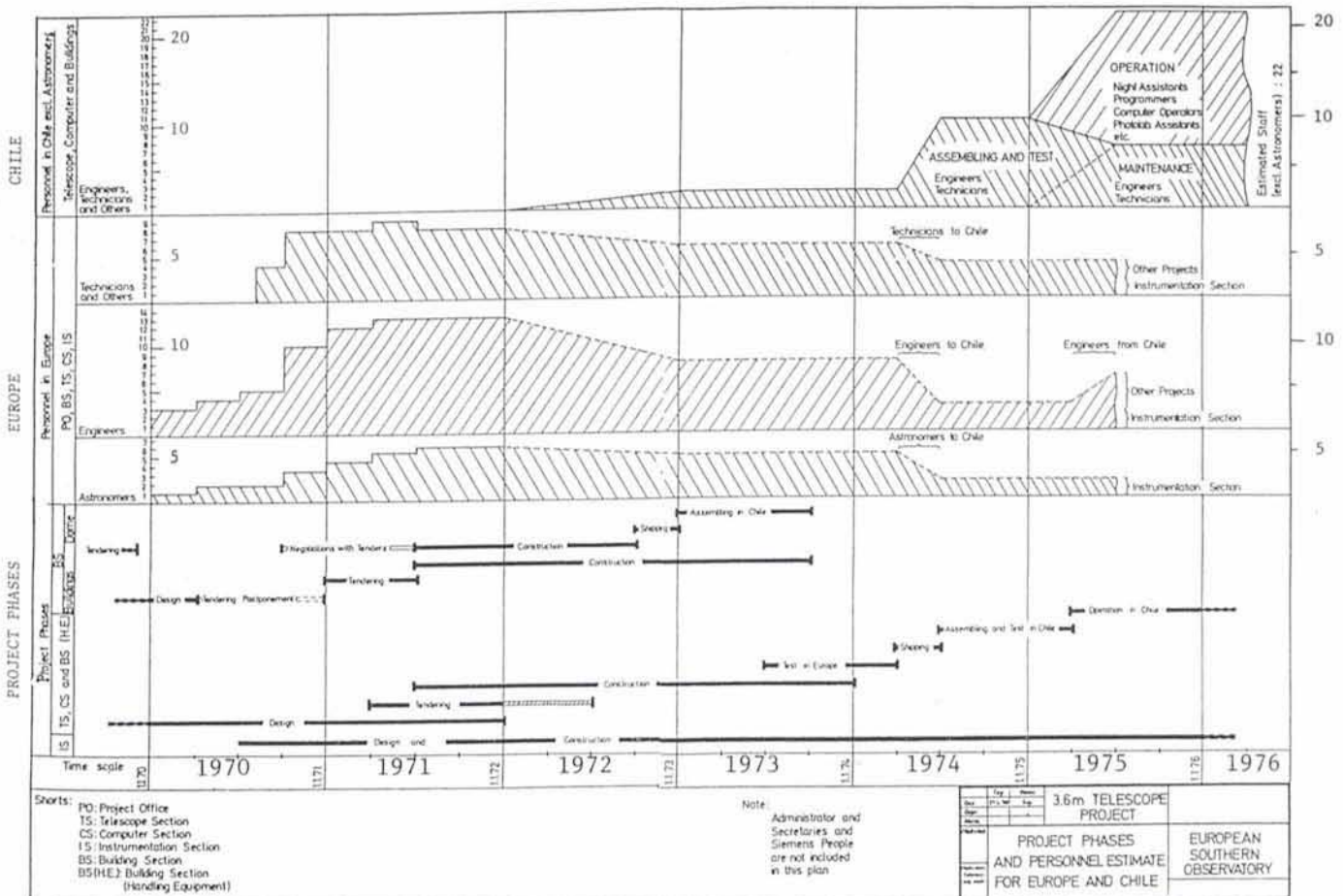
pects of the collaboration with CERN including the proposition that the ESO Headquarters should move from Bergedorf to Geneva, and the third one briefly dealt with concern about the position of the ESO project relative to certain national projects in astronomy. In the present context I shall only refer to the first part; in article XI I expect to return to the other two.

Starting point for part I was a compila-

tion, prepared by Heckmann, of possible ways one might choose from in the case of involvement of industrial firms, with varying degrees of participation by Strewinski's bureau. A solution of this kind would have been preferred by Heckmann, but none of those suggested seemed attractive in comparison with the prospect of collaboration with CERN. With reference to the growing internal technical group headed by Laustsen and described in the previous article, the document elaborated on how this Group might operate in conjunction with CERN, and it expressed preference for the "incorporation proposition", the



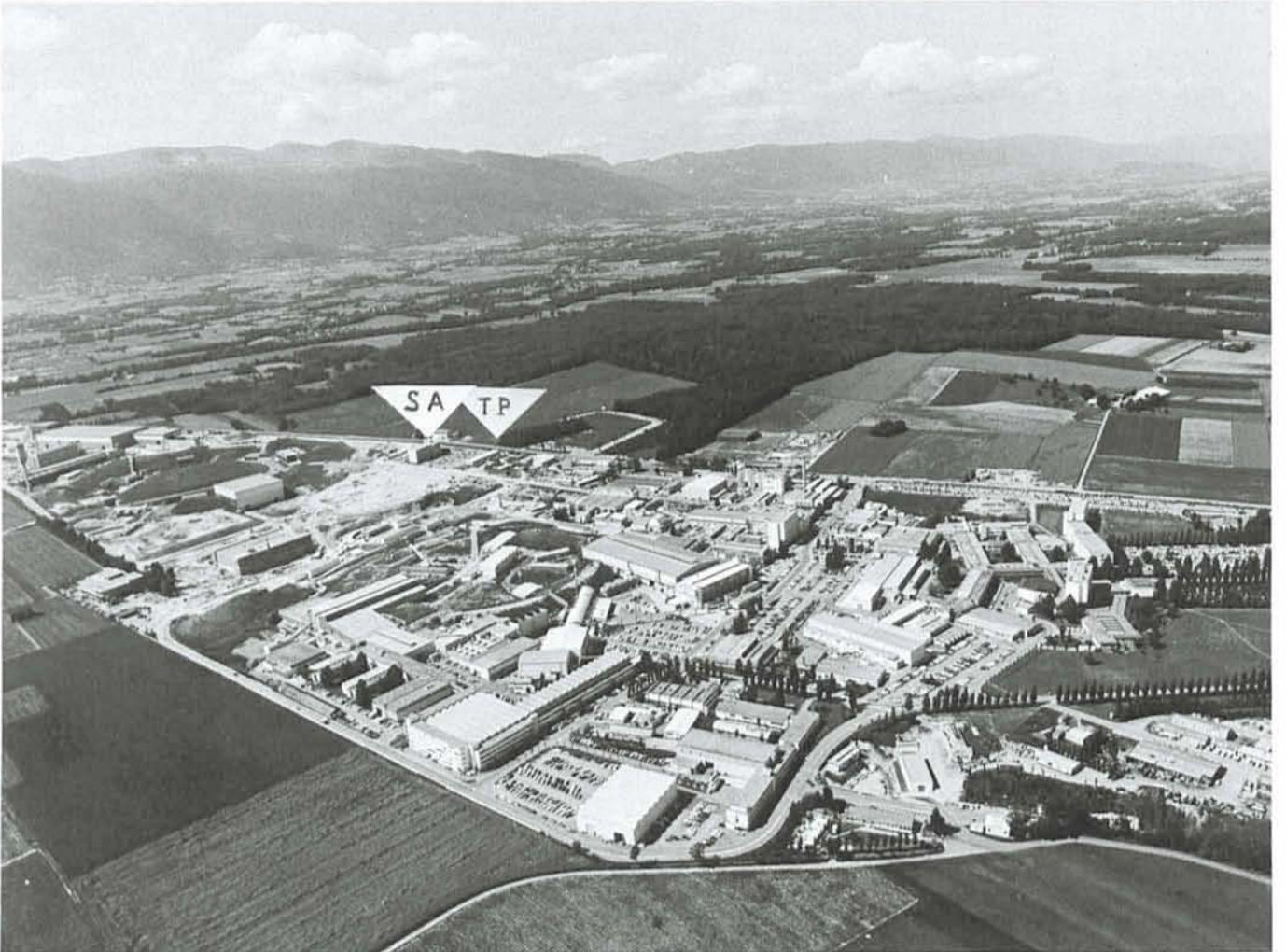
In May 1970, the ESO Directorate submitted to Council a proposal (Doc. Cou-66) for the structure, the constitution and the time schedule of an in-house group for the realization of the 3.6-m Telescope. It was endorsed by Council in its meeting of June 11, 1970, and provided the starting point for the execution of the project by the ESO TP Division in the next six years in collaboration with CERN. The two diagrams reproduced here from Cou-66 present the proposed administrative structure of the Group and the estimated time schedule for the period 1970-1976; the latter diagram illustrates the varying degree of involvement of engineers, technicians and astronomers and the shift of their activities from Europe to Chile towards the end of the period.





On September 16, 1970 at CERN, the contract was signed between ESO and CERN for collaboration in the realization of the ESO 3.6-m Telescope and its auxiliary equipment. The two photographs show, from left to right: J.H. Bannier, President of the ESO Council, B.P. Gregory, Director General of CERN, G. Hampton, Head of Administration of CERN, A. Blaauw, Director General of ESO, and E. Amaldi, President of the CERN Council.

From photographs in the EHPA.



ESO's establishments on the premises of CERN.

By the end of 1970, a few months after the collaborative agreement between ESO and CERN had been signed, the Telescope Division had established itself in the building made available by CERN and marked in the above photograph by TP. The photograph shows the extensive complex of CERN's laboratories, technical facilities and administrative services, located at Meyrin near Geneva as they were in 1970.

A few years later, as will be described in the next article in this series, ESO's Sky Atlas Laboratory also was established on the CERN premises: it was housed in the building marked SA, facing the TP Division.

From photograph in the EHPA.



The southern part of La Silla, early 1970. At that time, the intermediate-size telescopes were in regular operation; of these, we show here, at left, the 1-m Photometric Telescope and next the Grand Prism Objectif (GPO). Next to this, in the background, the dome of the Schmidt telescope, at that moment still waiting for the telescope's arrival (this happened at the end of 1971). In the far background, beyond the hill with the water tanks, the flattened summit prepared for the 3.6-m telescope. This one, however, would have to wait longer . . . ; early 1970 was the time of the renewed planning of the realization of the telescope.

This photograph is one of a set taken for the firm of Hochtief that constructed the buildings of the first construction phase on La Silla and the Headquarters in Santiago. These photographs together with rather detailed descriptions of the buildings have been published in the July 1971 issue of the magazine *Hochtief Nachrichten* (in EHA-I.C.3.2.).

closest of the forms of collaboration sketched at CERN on October 21. It recognized, though, that besides the many advantages of this solution (notably CERN's established experience in non-profit scientific instrumental development), there was the danger that the negotiations with CERN might lead to longer delays than negotiations with private firms. In the most favourable case they might lead to complete clearance at the June 1970 CERN Council meeting. A complicating, uncertain element in the discussions were the financial implications of the two forms of collaboration, with CERN or with industry.

The ESO Council meeting of December 1969 reacted by creating a number of staff positions required for the work of the Laustsen Group and encouraged the (future) Director General to further pursue the negotiations with CERN, although more information on industrial participation remained desired.

Most outspoken in its preference for CERN was the French delegation. Let me quote part of the statement of its member, the astronomer André Lallemand:

"La réalisation de ce grand télescope est à la limite de nos possibilités techniques, toujours parce que l'expérience à cette échelle nous manque en Europe.

Ce que je vais dire n'est aucunement une critique de l'excellent travail fait par le Comité des Instruments et par les ingénieurs qui ont travaillé au projet, mais il suffit de lire le document Cou-59 du 8 décembre 1969, pour être persuadé de cette inexpérience. ---

Ceci montre que l'ESO a un besoin impérieux de l'assistance d'un organisme expérimenté, ayant l'habitude de traiter des questions semblables et de même envergure, et d'un organisme n'ayant pas des fins et des activités à caractère commercial et lucratif. Cette assistance nous l'avons trouvée au CERN et devant l'ampleur des difficultés

que nous allons rencontrer, je souhaite qu'elle soit la plus large possible. ---

On peut rêver à ce que pourra être l'ESO dans le futur, il est agréable de penser que non seulement l'ESO pourra fournir des moyens d'observation extrêmement puissants, mais qu'elle pourra être aussi un centre culturel où les astronomes européens pourront travailler en étroite collaboration, et où les théoriciens et les observateurs pourront échanger leurs idées et leurs résultats, mais --- Il faut d'abord réaliser vite et bien notre grand télescope, cette réussite est l'enjeu de l'existence même de l'ESO."

The German delegation, on the other hand, insisted strongly on exploring more extensively industrial participation.

Pursuing the In-House Group Concept: Doc. Cou-66

After the December 1969 Council meeting, parallel to pursuing external

participation, the ESO Directorate worked out a scheme for realizing the telescope by means of a powerful in-house technical group. This led to the important document Cou-66 "The ESO 3.6-m Telescope Project" that became the basis for further policy decisions. It was prepared at the Bergedorf office by the working group for the development of telescope operation and auxiliary instrumentation (of which I mentioned the creation at the end of the previous article): Laustsen and his associates Blichfeldt, Malm and Scharnweber, with the advice of the Technical Director Ramberg. It was presented to the Committee of Council for its meeting of May 6, 1970 and had three points of departure:

"A. ESO must form its own group of astronomers, engineers, etc. which group shall be able to conduct the project through all its phases including the first period of operation of the instrument in Chile.

B. The group must at any time have all parts of the project under firm control. But --- a major part of the design work and all construction work will have to be done by consulting and manufacturing firms.

C. --- For its task in Europe [the group] should be located in a scientific and technological milieu and be offered good service facilities."

The various sections of the document dealt with Administrative Structure, Project Office, Building Section, Telescope Section, Computer Section, Instrumentation Section, Personnel Plan for Design Phase, and Long-Term Schedule and Personnel Plan. Throughout, there was reference to the possibility – but not necessity – that the group might be established at CERN, and the document was inspired by consultations with staff of CERN.

Starting point for the planning was the situation at the end of 1969, laid down in Ramberg's Status Report Cou-59. Making optimal use of what had been done so far on the project was a natural point of departure, although this was hampered by reluctance of Strewinski's bureau to provide documentation beyond the design drawings already delivered to the Instrumentation Committee. The long-term time schedule foresaw completion of building and dome on La Silla by October 1973, completion of assembling and testing of the

telescope on La Silla around April 1975, and hence first operations in the course of that year.

No financial schedule was given, but much attention was paid to the detailed personnel planning which should be one of the principal bases for budget planning. For astronomical and technical staff – but not including administrative and secretarial help – the following personnel complements were foreseen: per January 1971, 24.5; per July 1971, 29; per January 1972, 27; and approximately that same level for the following years. At the time of submission of the report, Laustsen's group counted 5.5 members. The steep growth to some 25 or 30 members represented what had been expected from comparisons with large telescope projects elsewhere; it also underlined one of the serious shortcomings of the previous arrangement: the shortage of staff of the bureau of Strewinski. The personnel development plan given in Cou-66 is reproduced here in the accompanying diagram.

For the sake of comparison with projects elsewhere of comparable scope, Council was also presented with data obtained from AURA's Large Telescope



On December 31, 1971, Jöran Ramberg resigned as Technical Director after having been associated with ESO since November 1963 and having essentially contributed to its building programme and to putting the 3.6-m Telescope Project on the new track. These photographs, taken at his farewell party, show:

upper left: Jöran Ramberg, Mrs. Bloemkolk, and Johan Bloemkolk (Head of Administration).

upper right: Mrs. Ramberg, Jöran Ramberg, and Mrs. Bloemkolk.

lower left: H.W. Marck (accountant), Mrs. Bachmann, G. Bachmann (Head of Finance), Mrs. Behr, and A. Behr (consultant astronomer). Photographs from EHPA.

Division, from the large radio telescope projects of the Max Planck Foundation at Bonn and of the Westerbork Project, and of the large optical telescope project of the Max Planck Foundation at Heidelberg.

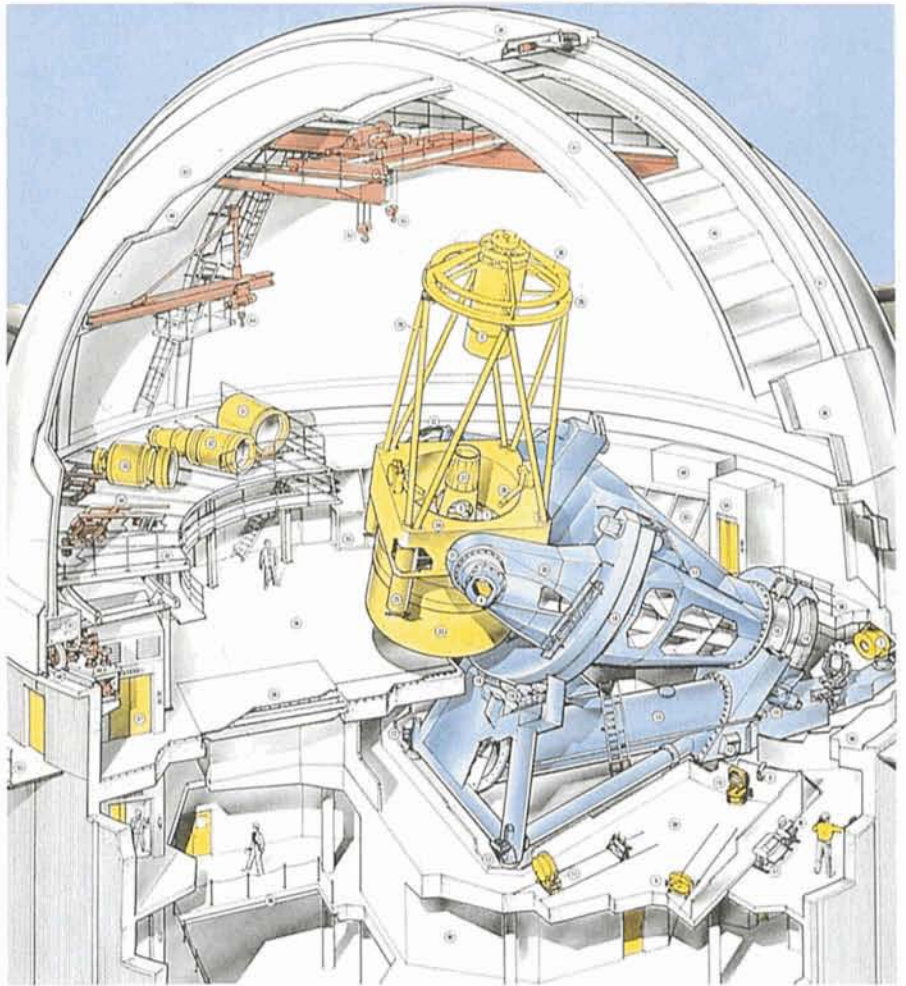
First ESO Committee of Council Meeting, May 6, 1970

On May 6, 1970 the ESO Committee of Council held its first meeting. As mentioned before, it had been created – following CERN practice – for discussing informally in advance of Council meetings items requiring consultation between ESO management and governments, or between the government delegates mutually, and it thus would help avoiding controversial situations at the Council meetings. The accompanying tables show the meetings of Council, Committee of Council and Finance Committee, and those of the Instrumentation Committee for the years 1970–74. Committee of Council consisted of the Council President and the Presidents of the IC, the FC and SPC, plus one Council member of those states not represented among these. It proved to be a very useful instrument; its meetings were held sufficiently in advance of the Council meetings that in the intervening period also advice from the IC or FC could be obtained. The proposal for collaboration with CERN was typically one to benefit from such preparatory activity.

Basic documents for this meeting were Cou-66 mentioned before, and a draft contract with CERN that meanwhile had been prepared by the administrative departments and legal advisors of the two organizations. Nucleus of the draft contract – based on the assumption of establishment of the Telescope Group on the CERN premises – were the services to be rendered by CERN: administrative, technical and professional. The Committee of Council meeting decided to submit a somewhat amended draft to the ESO Council, to be supplemented with the advice of the IC, the FC, and the SPC. Alternative solutions by collaboration with major industrial firms, like MAN, had meanwhile been further explored, mainly by Ramberg, but it turned out that these firms were at best interested in realizing the construction of the telescope once the project would be well defined – and not in participating in the design work.

Council Resolves to Collaborate with CERN

The Instrumentation Committee in its meeting of June 2, 1970 following that



Once the work of the TP Division was well under way, the expected appearance of the telescope-to-be was presented in a colourful poster. A black-and-white reproduction of the poster, designed by Tony Lofthouse in 1973, appeared in the ESO Annual Report of 1974. The section reproduced here shows the main features of the telescope, the design reflecting the early ideas of Strewinski described in the previous article.

of the Committee of Council, after first endorsing the establishment of the Telescope Group as described in Cou-66, strongly supported the proposed collaboration with CERN. The FC, in its meeting of May 22, had remained faced with uncertainty as to the financial implications, but this was inherent to a situation in which reliable cost estimates could be obtained only after the telescope group would have started its work.

The Chairman of the SPC, Strömgren, was prevented from attending the forthcoming Council meeting, but provided the Council President with a written statement of June 4 along the lines of his advice expressed verbally at Committee of Council. The following passages are quoted from this letter:

"I wish to emphasize the urgency of the situation regarding the construction of the 3.6-m telescope, and the necessity of reaching a decision soon on the questions of the Telescope Development Group as well as the agreement with CERN ---. I must emphasize the

difficulty of the ESO situation: We do concentrate on the 3.6-m telescope, but we do not now consider the proposals that were made by the SPC to supplement the instruments already agreed on with instruments for other purposes, of intermediate size. Therefore, the way it looks is that during the period when ESO is constructing the 3.6-m telescope, there will be at the disposal of the whole ESO community of astronomers only the 152 cm and the 100 cm Telescopes, some smaller telescopes, and the Schmidt Telescope. ---. The conclusion is, that any further delay that would lengthen the lead-time – indeed any postponement regarding the 3.6-m Telescope – would endanger the future of ESO. ---" [9].

At the Council meeting of June 11, 1970, consensus of opinion was definitely in favour of both, creating the Telescope Development Group and collaboration with CERN, and Council accordingly resolved to submit a corre-

(continued on page 36)