ESO'S EARLY HISTORY, 1953–1975

IV. Council and Directorate Set to Work; The Initial Programme of Middle-Size Telescopes*

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„Es würde mir als lohnende Aufgabe erscheinen, den Rest meines wissenschaftlichen Lebens dem Aufbau des ESO zu widmen."
From a letter of O. Heckmann to J. H. Oort of December 1, 1961.

Introduction

Once the ESO Convention had been signed, in October 1962, and the ratifications were in sight (completed January 1964), many activities developed: by the ESO Council, the now "legal" successor of the ESO Committee, and by the ESO Directorate headed by Heckmann. In the present and the next two articles I shall describe developments over the six years which followed, leading to the dedication ceremonies on La Silla in the spring of 1969. These ceremonies marked the completion of what we may now call ESO's first phase.

In these developments we distinguish two main lines. In Europe: building up ESO's organizational structure including financial, personnel, legal and many other matters as well as the design and construction of telescopes and auxiliary instrumentation of the "Initial Programme" defined in the Convention. In Chile: the extensive programme of infrastructure and constructions; building up the Observatory on La Silla and the facilities in Santiago and La Serena. In the present article we deal with activities in Europe, and in the two following articles turn to those in Chile.

Heckmann Becomes ESO's First Director, November 1962

The need for executive leadership was felt soon after the ESO Committee had undertaken to realize the ESO project, but particularly so in the late 1950's, and names of candidates were proposed. The most obvious choice was Charles Fehrenbach, in view of his accomplishments in instrumentation and in building up the Haute-Provence Observatory. However, these and other obligations in French astronomy made it impossible for him to accept. As a second possibility my name was mentioned, but obligations with regard to the directorship of the Kapteyn Laboratory assumed in 1957 made me, too, refrain; instead I took over the Secretariat of the ESO Committee from Bannier from early 1959 [1]. This was a temporary solution, and the need for a director remained.

The solution was found when in the course of 1961 Otto Heckmann, a member of the ESO Committee, appeared to seriously consider a suggestion, made from various sides, to take the task upon himself. The matter was discussed between him and Fehrenbach during their joint visit to American observatories in the summer of 1961 to which we shall return below [2]. Soon after this, responding to a remark in a letter of Oort, Chairman of the EC, of November 27, 1961, Heckmann wrote on December 1, 1961 [3]:

„– – – Es würde mir als lohnende Aufgabe erscheinen, den Rest meines wissenschaftlichen Lebens dem Aufbau des ESO zu widmen. Da ich aber mit der Universität Hamburg und der Hamburger Sternwarte sehr fest verknüpft bin, so ist die Lösung dieser alten Bindungen schwierig – – –".

In the meeting of the EC of June 18, 1962, Heckmann accepted, first for one year only, from November 1, 1962, and subsequently on a long-term basis. Heckmann was then 60 years old. He put his shoulders under the ESO task until his retirement per January 1, 1970: determinedly, and with plenty of drive. After the necessary preparations he felt ready for the job in the spring of 1963, so that by circular letter of April 17, 1963, signed by Bannier and Heckmann, executive authority and financial responsibility were transferred per May 1, 1963 from Bannier as Treasurer of the EC to Heckmann as Director [4].

Heckmann's first associate at Directorate level was André Muller who had been heavily involved in the site tests, first in South Africa and next in Chile. As Superintendent for Chile his main responsibility would become the supervision of the extensive construction programmes. Muller's employment as an associate of Heckmann started per January 1, 1963, but since at that time ESO did not yet possess the administrative set-up for formalizing the appointment, he first remained on the payroll of the University of Groningen to whom ESO reimbursed his salary [5]. Muller was the first staff member to become permanently employed by ESO.

Per April 1, 1963, Heckmann appointed the accountant H.W. Marck, and the next appointee – apart from temporary secretarial help – was J. Bloemkolk as Manager per October 1, 1963 [6]. Bloemkolk's assignment was meant to be in Chile, but it was fairly soon changed into one covering the administrative business of the Director's Office. Another important appointment was that of Jöran Ramberg as Assistant Director per November 1, 1963. A staff member of Stockholm Observatory, Ramberg had since November 1961 contributed to the development of ESO as a Secretary of the Instrumentation Committee, the role of which will be described below. He would become Heckmann's right hand in the development of instrumentation and buildings.

After the ratifications, from early 1964, ESO staff underwent rapid growth which we shall not follow in detail; we will have occasion to refer to certain staff members individually in the context of their tasks. This may be the proper occasion, though, to acknowledge the dedicated role of Otto Heckmann's wife, Johanna ("Hanna") Heckmann-Topfmeier who closely accompanied her husband in almost all areas of his comprehensive task, and thereby became intimately acquainted with the ESO project. Whereas at formal occasions she remained in the background, she used to take an appreciable share in the daily administrative chores of the Office; energetic, cheerful – and, as an unpaid employee, not without a bit of embarrassment for Council . . .

Mrs. Johanna Heckmann-Topfmeier, wife of Otto Heckmann. Mrs. Heckmann volunteered as an assistant to her husband in many of his administrative and organizational tasks.
From a slide in the ESO Photographic Archives taken in February 1969 at ESO Headquarters in Santiago by Heckmann, and marked "Hanna" in his handwriting.

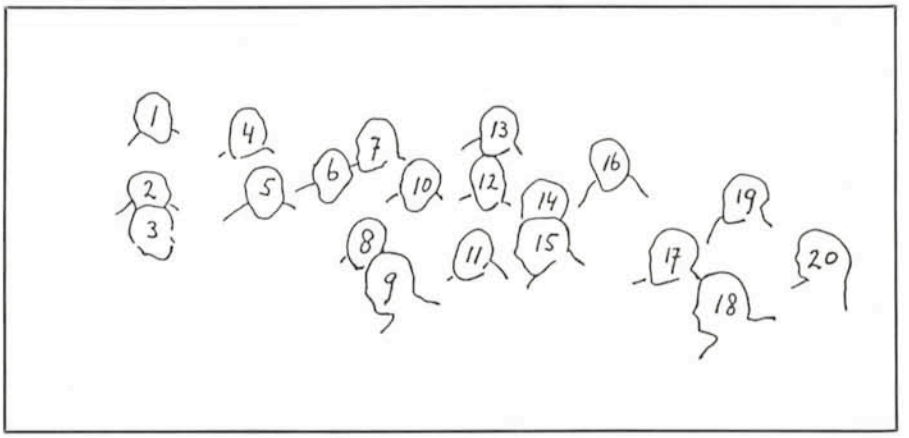
* Previous articles in this series appeared in the *Messenger* Nos. 54, 55 and 56.

Council and Finance Committee

Article V of the ESO Convention defines the constitution and tasks of the Council. It consists of two delegates per Member State of whom at least one should be an astronomer. The Financial Protocol attached to the Convention (and referred to in its Art. V.2.b.) defines the constitution and task of the Finance Committee (henceforth to be denoted by FC). It is, next to Council, the most authoritative administrative body. Contrary to other committees that help ruling the organization and for which the membership is determined by Council (like for instance the Instrumentation Committee) members of the Finance Committee are government representatives (Art. III of Fin. Prot.), one per Member State, and thereby form the direct link to the national financial authorities. No major financial decision is taken by Council without having been submitted first to the FC. Council policy and FC's counsel have always been intimately interwoven.

The accompanying table gives the dates and places of the meetings and the names of the Presidents of Council and of the FC over the period ending with the year 1969. The first Council Meeting, held in the French Ministry of Foreign Affairs right after the ratifications of the Convention, took place on February 5 and 6, 1964 and elected J.H. Oort as its first President. Oort resigned from this office at the Stockholm meeting of June 1965, to be succeeded by Bertil Lindblad – an election honouring Lindblad's important contribution to the creation of ESO. Unfortunately, on June 25 Lindblad passed away, after which Oort again chaired the Council Meeting on Nov. 30/Dec. 1, 1965. This meeting elected G.W. Funke, the non-astronomical Swedish Council delegate as President. After Funke had completed his three years in office – the maximum term allowed by the Convention – the Council in its meeting of Dec. 3 and 4, 1968 elected as President the non-astronomical delegate from the Netherlands, J.H. Bannier.

The first meeting of the FC took place on February 6, 1964 at Paris, immediately following the first Council Meeting. Its first President was J.H. Bannier, who was in office until he assumed the Presidency of the Council in December 1968. He was succeeded as FC President by the German government delegate K.F. Scheidemann.



On February 5–7, 1963, shortly after the ESO Convention had been signed, the ESO Committee at the invitation of the CERN Directorate held its 19th meeting in CERN's Council Room. The photograph, taken during a tour of the CERN laboratories, shows:
1. P. Bourgeois (Belgium), 2. M. Deloz (Belgium), 3. A. Reiz (Denmark), 4. ??, 5. G.W. Funke (Sweden), 6. J.H. Bannier (Netherlands), 7. B. van Geelen (Netherlands), 8. W. Fricke (German Federal Republic), 9. C. Zilverschoon (CERN), 10. Ms. B. Rijken (ZWO, Netherlands), 11. A.B. Muller (Netherlands), 12. J.H. Oort (Netherlands), 13. Ch. Fehrenbach (France), 14. O. Heckmann (German Federal Republic), 15. H. Siedentopf (German Federal Republic), 16. ??, 17. B. Lindblad (Sweden), 18. ??, 19. ??, 20. Ms. T. Stuit (Kapteyn Laboratory, Netherlands).

Earliest Developments in Instrumentation

Of the many tasks facing Council and Directorate in Europe, the development and realization of the observational equipment was the central one. From the outset it had been agreed that in accordance with Baade's proposal, the nucleus of the equipment should be a powerful reflector and a large Schmidt telescope. For the first one, the natural example was the 120-inch reflector of Lick Observatory with its up-to-date design by the Lick staff. It came into regular operation in February 1960 [7]. Aiming at a still larger size such as that of the Mt. Palomar 200-inch (in regular operation since November 1949 [8]) would have been too ambitious for ESO; exceeding the size of the Mt. Wilson 100-inch, the leading instrument of the past decades, was an interesting proposition. The Schmidt would be an essential auxiliary: the Palomar Schmidt, in operation since January 1949 [9] had proven to be indispensable as survey instrument for the work with the large telescopes. For both instruments, the design might be copied and thus time and costs be saved. We shall see, though, that ESO would prefer modified solutions.

As a third instrument, the first meeting of the ESO Committee, in June 1953, proposed a meridian circle, although a strong tradition in positional astronomy did exist in the Southern Hemisphere, established by the Observatories of the Cape and in South America. However, compared to the Northern Hemisphere their number was too small. Moreover, positional astronomy was a strong component of the work of several European observatories and overall coverage of the sky essential for the establishment of the fundamental reference system. As we shall see, not a meridian circle but a modern alternative would be acquired by ESO: a Danjon astrolabe. Other additional middle-size instruments, suggested at early EC meetings, included a copy of the Lick Double Astrograph and a copy of the Marseilles GPO. Only the latter would later be realized, it played a role in the site tests in South Africa (see article II). We shall return below to the further specification of the middle-size instruments.

The principal concern of the EC in the

COUNCIL				FINANCE COMMITTEE			
No.	Date	Place	President	No.	Date	Place	President
1	1964 February 5–6	Paris	J.H. Oort	1	1964 February 6	Paris	J.H. Bannier
2	1964 May 26–27	Obs. Haute-Provence	J.H. Oort	2	1964 May 26	Obs. Haute-Provence	J.H. Bannier
3	1964 December 2–3	Hamburg	J.H. Oort	3	1964 July 7	The Hague	J.H. Bannier
4	1965 June 1–2	Stockholm	J.H. Oort	4	1964 November 17	Bergedorf	J.H. Bannier
5	1965 Nov. 30/Dec. 1	Hamburg	(B. Lindblad †) Chairman: J.H. Oort	5	1965 June 1	Stockholm	J.H. Bannier
6	1966 April 1	Santiago de Chile	G.W. Funke	6	1965 November 11	Bergedorf	J.H. Bannier
7	1966 November 21–22	Hamburg	G.W. Funke	7	1966 March 31	Santiago de Chile	J.H. Bannier
8	1967 June 1	Hamburg	G.W. Funke	8	1966 June 28	Bergedorf	J.H. Bannier
9	1967 December 1	Hamburg	G.W. Funke	9	1966 November 15	Bergedorf	J.H. Bannier
10	1968 July 2–3	Brussels	G.W. Funke	10	1967 May 3	Bergedorf	J.H. Bannier
11	1968 December 3–4	Hamburg	G.W. Funke	11	1967 November 21	Bergedorf	J.H. Bannier
12	1969 March 22	Santiago de Chile	J.H. Bannier	12	1968 June 11	Bergedorf	J.H. Bannier
13	1969 June 16	Hamburg	J.H. Bannier	13	1968 November 19	Bergedorf	J.H. Bannier
14	1969 December 15–16	Hamburg	J.H. Bannier	14	1969 February 20	Bergedorf	K.F. Scheidemann
				15	1969 October 3	Bergedorf	K.F. Scheidemann
				16	1969 December 15	Hamburg	K.F. Scheidemann

early years was, however, a different matter; it realized that for the further planning, both financially and as to time schedule, it had to engage expertise in telescope design, not necessarily by an astronomer. Two names figured in the EC's deliberations already in the middle 1950's: those of B.G. Hooghoudt and of W. Strewinski, both well qualified. The engineer Hooghoudt was responsible for the successful design of the mechanical parts of the Dwingeloo radio telescope in the Netherlands which became operational in 1956. He did so as employee of the funding foundation ZWO, the director of which, Bannier, was prepared to make Hooghoudt's services available to ESO. The engineer W. Strewinski, an employee of the firm of Heidenreich and Harbeck at Hamburg, had been responsible for the design and construction of the Schmidt telescope recently acquired by the Hamburg-Bergedorf Observatory under Heckmann's directorate. This telescope was completed in 1955 [10], after which Strewinsky created his own design bureau.

The EC's and Council's ideal would have been to engage both experts in close collaboration in the context of a design bureau, but attempts towards this end were not successful. To some extent this was due to their very different personalities and background, but there was also the dragging uncertainty in the realization of the ESO project in the early years which forced the engineers to undertake other projects besides ESO. Concern about the failure to build up a strong design bureau, first among the EC, then among Council, is a recurrent theme in their meetings [11]. Eventually the two engineers became engaged in separate parts of the project. Hooghoudt collaborated in general logistic planning and became responsible for the design and the construction of the 1-m Photometric Telescope. He also, after a visit of observatories in the United States, prepared for the May and October 1957 meetings of the EC a report on design considerations for a large telescope [12]. Strewinski became deeply involved in the design and construction of the ESO Schmidt telescope and in the early design stage of the large telescope, a natural follow-up of his early close collaboration with Heckmann.

ESO's Oldest Committee, the Instrumentation Committee

In the earliest stage of ESO, when striving towards the Convention and conducting the site tests were the EC's main concern, the question of the future instrumentation was not yet prominent but the EC meeting of July 1958 did appoint an Instrumentation Committee (henceforth denoted by IC) consisting of O. Heckmann, A. Couder, R. Coutrez and J. Ramberg. However, little progress was made during the following two years. In July 1960 Fehrenbach was added to the IC and soon afterward, when the prospects for financing became more favourable, the IC became very active. Its meeting of January 3, 1961 at Paris was henceforth denoted as Number 1 in the long series to follow. Those up to the year 1970 are listed in the accompanying box. The rapid succession of meetings early in 1961 reflects the enhanced activity. The IC soon created subcommittees for dealing with particular aspects of the instrumentation; their meetings will not be systematically recorded here.

By the time of the completion of the required ratifications of the Convention, early 1964, the IC had met twelve times. Its chairmanship alternated between Heckmann and Fehrenbach until Heckmann became Director per November 1, 1962. From then on Fehrenbach chaired the IC, a task to which he would dedicate himself over almost ten years, till 1972. The first Secretary of the IC was J.

No.	Date	Place	Chairman/President	Minutes made by	Minutes in Files ESO Head of Adm.	Remarks, Ref. to EHA.
1	1961 January 3	Paris	O. Heckmann	J. Ramberg	+	
2	1961 February 22–24	Obs. H.-Provence	Ch. Fehrenbach	G. Courtès?	+	
3	1961 April 18–19	Paris	Ch. Fehrenbach		–	Agenda in I.C. 1.9.c. Report in letter by Minnaert to Oort + Blaauw in EHA – I.C. 1.9.c.
4	1961 June 9–10	Tübingen	Ch. Fehrenbach		–	Agenda in I.C. 1.9.c.
5	1961	Paris	?		–	
6	1961 November 11–12	Bergedorf	O. Heckmann	J. Ramberg	+	
7					–	
8	1962 June 16–17	Uccle	?		–	
9	1962 October 17–18	Stockholm + Saltsjö-baden	O. Heckmann	J. Ramberg	+	
10	1963 January 29–30	Utrecht	Ch. Fehrenbach	J. Ramberg	+	
11	1963 May 14–15	Paris	Ch. Fehrenbach	J. Ramberg	+	
12	1963 October 1	Heidelberg	Ch. Fehrenbach	J. Ramberg	+	
13	1964 March 11–12	Liège	Ch. Fehrenbach	J. Ramberg	+	
14	1964 June 25–26	Bergedorf	Ch. Fehrenbach	J. Ramberg (Assistent Dir.)	+	
15	1964 September 4	Hamburg	Ch. Fehrenbach	J. Ramberg	+	
16	1965 January 18–19	Bergedorf	Ch. Fehrenbach	J. Ramberg	+	
17	1965 May 18–19	Bergedorf	Ch. Fehrenbach	J. Ramberg	+	
18	1965 December 2	Bergedorf	Ch. Fehrenbach	J. Ramberg	+	
19	1966 January 18	Paris	Ch. Fehrenbach	J. Ramberg	+	
20	1966 May 26–27	Obs. H.-Provence	Ch. Fehrenbach	F. Dossin	+	
21	1966 October 12	Paris	Ch. Fehrenbach	F. Dossin	+	
22	1966 November 23	Bergedorf	Ch. Fehrenbach	F. Dossin	+	
23	1967 May 2	Bergedorf	Ch. Fehrenbach	F. Dossin	+	
24	1967 December 18	Bergedorf	Ch. Fehrenbach	F. Dossin	+	
25	1968 July 4–5	Bergedorf	Ch. Fehrenbach	A. Behr + S. Laustsen	+	
26	1968 November 5–6	Bergedorf	Ch. Fehrenbach	A. Behr + S. Laustsen	+	
27	1969 January 15–16	Bergedorf	Ch. Fehrenbach	A. Behr + S. Laustsen	+	
28	1969 May 8	Bergedorf	Ch. Fehrenbach	A. Behr + S. Laustsen	+	
29	1969 June 2	Nice	Ch. Fehrenbach	A. Behr + S. Laustsen	+	

Ramberg who continued to act in this capacity until May 1966, long after he had joined the ESO Directorate.

Attempts to reconstruct the early proceedings of the IC are hampered by the fact that the ESO Historical Archives do not (yet) contain the minutes of the IC meetings. Fortunately, many of these minutes do form part of the Files of the ESO Head of Administration; lacking from these are minutes of meetings Nos. 3, 4, 5, 7 and 8 pertaining to the period April 1961 to June 1962 but these are, of course, interesting ones for the earliest developments. We therefore have to consult the reports on the IC's proceedings presented at the meetings of the EC which in most cases are fairly detailed. Information is also contained in a number of letters, for instance for meeting No. 3 in a letter by M. Minnaert

Second Meeting of the ESO Council, with their advisors on May 26–27, 1964, at Observatoire de Haute-Provence.
From left to right:
Left-hand photograph: J.H. Bannier, M. Deloz, K. Walters (legal advisor to the Director), J. Ramberg, O. Heckmann, J.H. Oort.
Right-hand photograph: B. Lindblad, G. Funke, A. Reiz (Observer for Denmark), J. Rösch, A. Blaauw.
The left-hand photograph is part of the ESO Historical Archives contributed by J.H. Bannier, the right-hand one was contributed by the author. Most likely, more photographs of the session were taken . . .

to Oort and Blaauw of May 1, 1961 [13].

One of the first things the IC set out to do, was acquainting themselves with instrumentation developments elsewhere in the world, especially in the United States. This was in line with the policy the EC had stressed from the beginning and which had led to Hooghoudt's 1957 report, and the EC was encouraged by the generous way in which American institutes offered their help in building up ESO. Thus, immediately after the Assembly of the International Astronomical Union in California in the summer of 1961, Heckmann and Fehrenbach made an extensive tour along observatories in the United States and Mexico and visited prominent astronomers among whom I.S. Bowen, N.U. Mayall, D. Shane, A.E. Whitford and G. Haro. Their report [14] was discussed at the 15th meeting of the EC, in November 1961. It deals with questions of telescope design, the choice of the site, design of domes and, finally, with matters of general policy. From this last section, let me quote a few paragraphs:

"Nos amis américains ont confirmé notre opinion que la responsabilité de toute la construction doit être prise par les astronomes. C'est à nous de décider les solutions de principe, d'accepter et de contresigner tous les plans.

– – – La réussite de nos collègues du Mont-Palomar s'explique en grande partie par la collaboration intime des astronomes et des ingénieurs travaillant tous à Pasadena et se réunissant très régulièrement.

Ces heureuses circonstances paraissent difficiles à réaliser par notre groupe européen. Une collaboration active de certains d'entre nous est néanmoins absolument nécessaire.

Il faut créer rapidement un bureau d'Ingénieurs – – –. La construction d'un Centre d'Etudes et probablement d'un laboratoire d'optique nous paraît également indispensable. – – –".

The first paragraph stresses the desirability of the complete involvement of the astronomers themselves in design and construction, and reflects a change in attitude sometimes encountered in previous telescope acquisition when much more of the ingenuity and responsibility was with the firm who delivered the telescope, sometimes even "off the shelves".

The report also led to discussion of the question with whom the ultimate authority for decisions on matters of instrumentation should be; with the IC, or with the EC (or, later, the Council). This led to a task description for the IC implying a considerable degree of authority [15]:

"– 1. The IC prepares all technical and financial aspects of the instrumentation in order to enable the Council to take the necessary decisions;

– 2. The IC makes all necessary instrumental and technical decisions within the frame of the budget and of the decisions of the Council."

Based on this task description, the Instrumentation Committee has played a very influential role in ESO's early development.

Naturally, because the large telescope and the Schmidt form the nucleus – the *raison d'être* – of ESO, their history should figure prominently in these reviews. Yet, we shall in the present article confine ourselves to the acquisition of the middle-size telescopes because these constituted the outfit on La Silla when the Observatory started regular operation in the late 1960's. The early histories of the Schmidt and the Large Telescope, both having become operational only in the course of the 1970's, will be central themes to be treated after I have dealt with the phase concluded in 1969. For the Schmidt, this will then also comprise the impressive associated survey projects.

The Middle-Size Telescopes

One of the IC's first assignments was the specification of the telescopes which, as part of the "initial programme" of the Convention would be referred to as:

"c. not more than three telescopes with a maximum aperture of 1 meter;" and

"d. a meridian circle;"

For two of the three telescopes mentioned under (c) the IC meeting of April 1961 arrived at the following recommendations: one telescope designed primarily for photo-electric photometry – it would become known as the Photometric Telescope – and one telescope designed primarily for spectroscopic work – to become the Spectrographic Telescope. We shall first deal with these two, and subsequently see how the two remaining items were filled in with the GPO and the Astrolabe.

The procedure chosen by the IC for the realization of these two instruments reflects in an interesting way ESO's international character. It "planted" the planning and construction in the fertile soil of the various national interests. Thus, the Photometric Telescope became a concern of astronomers in the Netherlands, especially of those of the Kapteyn Laboratory at Groningen where photo-electric photometry was being developed by J. Borgman and collaborators. Also involved in this project was M. Minnaert of Utrecht who, with Borgman, acted as liaison with the IC. Similarly, the Spectrographic Telescope was delegated to French astronomy, especially to the group around Ch. Fehrenbach at Marseilles and the Haute Provence Observatory. (The early planning of the Schmidt Telescope, to be described later, under the supervision of Bergedorf Observatory's director, Heckmann, reflects this same policy.) The policy of the EC to delegate development and realization of the middle-size telescopes to the above groups also resulted from a wish of the EC, to gain experience with different firms which might become useful for the construction of the large telescope [16].

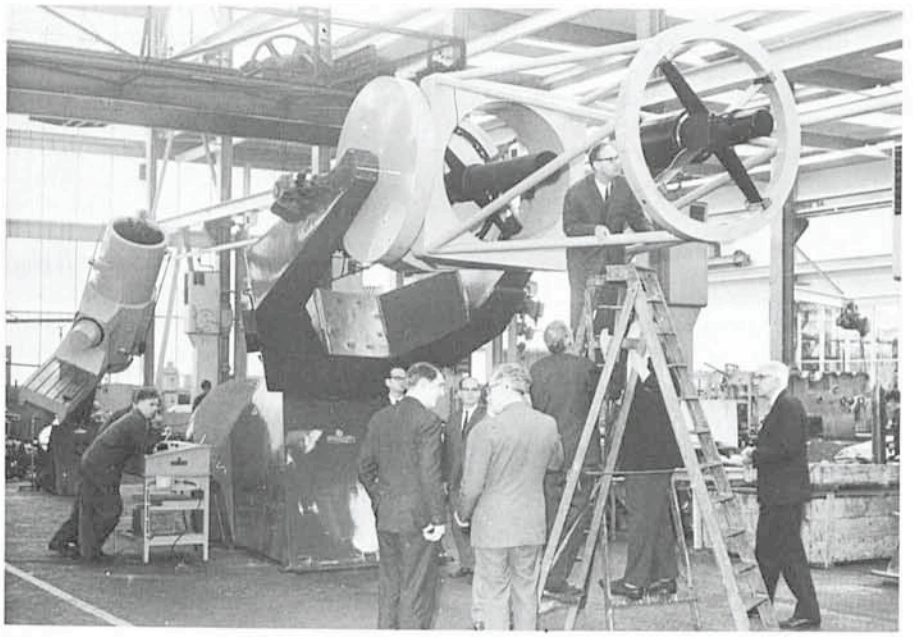
The 1-Metre Photometric Telescope

Early 1961 the group involved at the Kapteyn Laboratory formulated the most essential specifications for the design of this telescope [17]:

– optimum definition on the optical axis, but image quality outside the axis good enough for offset purposes;
– fairly rapid switching between widely different directions; for this purpose aiming at a short telescope tube;
– provision for heavy photometric equipment at the Cassegrain focus and for at least one more photometer or spectrograph at another (Nasmyth) focus, with the possibility of rapid interchange;
– in connection with these specifications, preference for a fork mounting.

These specifications had been the subject of consultation with the engineer Hooghoudt, and reference was made to the 90-cm light-collector type telescopes in use at McDonald Observatory and at the Leiden Southern Station as possible examples.

At the April 1961 meeting of the IC, offers for the mechanical parts had been received from six firms, but the IC developed strong preference for the Dutch firm of Rademakers to whom Hooghoudt was consultant engineer [18]. Decisions to this effect and on the choice of a fork mounting – not an English mounting – were taken at the June 1961 meeting of the IC [19, 20]. For the optics of the telescope offers were received from five firms covering a variety of glass sorts (including regular glass and low-expansion Tempax and Silica) [21], and at the June 1962 meeting of the EC the IC reported that orders had been placed: for the mechanical parts with the Rademakers-Hooghoudt combination, for the main mirror with Jenoptik in Jena and for the secondary mirrors with Hereaus. The construction was supervised for the IC by Borgman and Minnaert. Meanwhile, preparations were made for the design and construction of the main photometer for the telescope.



The 1-m Photometric Telescope Nearing Completion. *By the end of the year 1964 the 1-m Photometric Telescope was almost ready to be delivered by the Firm of Rademakers at Rotterdam. It is shown here in their assembly hall on the occasion of a visit of the ESO group charged with the supervision of the construction. The photograph shows from left to right: (1) extreme left background: unidentified; (2) J. Doornenbal, mechanic, employee of ESO; (3) J. van der Ven (at that time at Rademakers, later to be employed by ESO); (4) J. Ramberg, Assistant Director of ESO; (5) on lowest step of ladder, B. G. Hooghoudt, consulting engineer for ESO; (6) high on ladder, the author of this article (Kapteyn Laboratory); (7) on lowest step of ladder, O. Heckmann, Director of ESO; (8) M. Minnaert (Utrecht Observatory). From a photograph in the ESO photographic archives, marked "7 DEC. 1964".*

The October 1962 meeting of the IC delegated this to Borgman, Minnaert and Siedentopf.

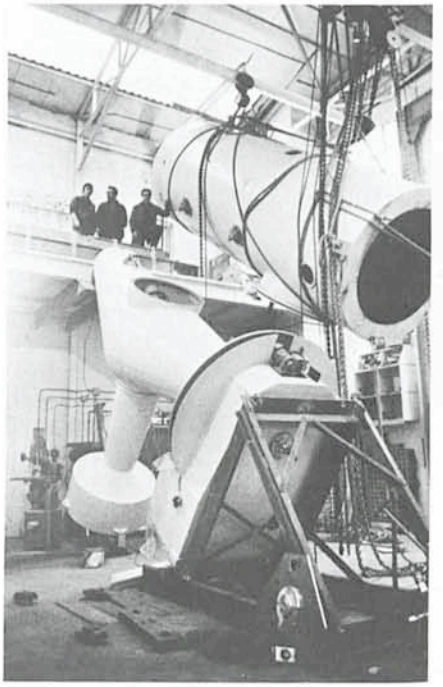
By the end of 1963, when the completion of the telescope would be a matter of little more than a year only, it had become clear that the telescope would not be used in South Africa. However, ESO was still a long way from completing its building programme in Chile, and potential users of the telescope were anxious to start soon. Therefore, it was suggested at the November 1963 meeting of the EC that a provisional, simple housing be acquired, and the May 1964 meeting urged an immediate decision on the matter. At that time the Convention had been ratified and the ESO Directorate had taken developments firmly in hand. It ordered from the United States a dome of light construction, popular among advanced amateur astronomers (Astro-Dome), and this was mounted on La Silla in the course of 1966. In October and November of that year the telescope was mounted in this provisional shelter under the supervision of the engineer Hooghoudt and the firm of Rademakers (after the telescope had arrived in Chile in the middle of 1965 and then stored in ESO's ware house at La Silla). In December 1966 the first photometric work was done by Borgman and collaborators with a simple photometer borrowed from the Kapteyn Laboratory. The ESO photometer for this telescope, constructed at the Kapteyn Laboratory, was mounted in the middle of 1967.

The Photometric Telescope has been described in detail by Hooghoudt in ESO Bulletin No. 1 of November 1966 which also contains a description of the photometer by M. de Vries. The telescope was moved to its permanent dome in the fall of 1968. The provisional dome has, since then, been used for several purposes and now houses the Leiden 90-cm telescope. A polarimeter for the 1-m telescope, installed at the end of 1968, was designed by A. Behr of the Hamburg Observatory and constructed under his supervision at Göttingen Observatory. A description by Behr is in ESO Bulletin No. 5 of December 1968.

The Spectrographic Telescope

Main specifications for this telescope, drawn up by the group around Fehrenbach at Marseilles and Haute-Provence and initially also planned in the 1-metre category, included: provisions for using both the Cassegrain and the Coudé focus, and an English mounting [22]. Offers were received from the same six firms as for the Photometric Telescope and preference was then given to the firm of REOSC in Paris with whom the French group had experience in the delivery of spectroscopic equipment. REOSC had also built the GPO telescopes. As an alternative, the IC had considered acquiring a replica of the Kitt Peak 36-inch telescope with some modifications [23]. This idea was given up, however, when in 1961 an appealing alternative was suggested by the French: a duplicate of the 1.5-metre spectrographic telescope for which the Haute-Provence Observatory was about to complete design studies [24]. Construction of two identical telescopes would result in prices exceeding only little the price of one 1-m telescope. The French design, envisaging a Coudé focus only, would have to be slightly adapted. Doubts arose whether the increase of the "Convention-size" from 1 to 1.5 metre would be acceptable for the ESO Council, but this never became a serious problem.

The offer of REOSC was accepted in principle by the EC meeting of February 1963 and became final after the ratification of the Convention [25]. A glass blank for the main mirror was ordered from Sovirel, Parra Mantois, and blanks for the secondary mirrors from Corning. For the spectrographs, design studies – with strong contribution from the French group – were taken up by the IC early in 1963 and for the Coudé spectrograph the order was placed at REOSC in October 1965. The two telescopes were



The 1.5-m Spectrographic Telescope Nearing Completion. *The Spectrographic Telescope in the assembly hall of the firm of REOSC, shortly before its shipment to Chile. From a photograph in the ESO photographic archives, marked "REOSC 91-Ballainvilliers" in envelope marked "February 1968".*

completed in the course of 1967 and the optics for ESO's copy tested in the Haute-Provence duplicate before being shipped to Chile. In the middle of 1968 the telescope was installed in its dome on La Silla under the supervision of the director of REOSC, A. Bayle. At the December 1968 Council Meeting Fehrenbach, just back from a stay on La Silla, could report that the instrument worked satisfactorily. For the first spectroscopic work, a Cassegrain spectrograph was borrowed from Marseilles Observatory. It would soon be replaced by ESO's own Cassegrain spectrograph "Chilicass". The Coudé spectrograph was finished by the end of 1968 and became operational on La Silla in the course of 1969.

A detailed description of the Spectrographic Telescope and the Coudé spectrograph was published by Fehrenbach in ESO Bulletin No. 3 of February 1968. The Cassegrain spectrograph is described by A. Baranne, E. Maurice and L. Prévot of Marseilles Observatory in ESO Bulletin No. 7 of Sepember 1969 and by Maurice in ESO Bulletin No. 11 of February 1975. The Coudé spectrograph was described by H.J. Wood, B. Wolf (staff members of ESO) and Maurice (of Marseilles) in ESO Bulletin No. 11 of February 1975.

The GPO (Grand Prism Objective)

We have seen in article II that around the year 1960 the GPO was introduced by its owner, the Marseilles Observatory, into the site testing activities in South Africa as one of the projects which would allow testing in combination with astronomical research. Eight years later, in the course of 1968, having meanwhile become ESO property, it started regular work on La Silla.

The ESO GPO was a duplicate of the GPO installed at the Haute-Provence Observatory (OHP). These twins represented an improvement of the smaller size instrument of this type at the OHP (the Petit Prism Objectif) developed earlier by Fehrenbach. Main motivation for this development had been the prospect of measurement of radial velocities of faint stars in a wholesale manner. The GPO consists of a photographic and a visual tube, each of 4 metre focal length. The photographic one has a doublet objective lens of 40 cm aperture, in front of which is mounted an objective prism of the type developed by Fehrenbach. This consists of two components, one of flint glass and one of crown-barium, and the angles of the two components are chosen in such a way that at wavelength 4175 Å the light traverses the combination without deflection. Hence, by taking two exposures with the prism in opposite orientations, one obtains on the photographic plate for each star two nearly coincident spectra in opposite directions, and the relative displacement of the spectral lines in the two is a measure of the radial velocity of the star. For a more detailed description we refer to the article by Fehrenbach in ESO Bulletin No. 1 of November 1966.

The possibility that the GPO planned for South Africa might become property of ESO was alluded to already in the late 1950's at the time when – as we saw in article I – the prospects for French participation in ESO were very low. For instance, it is mentioned in the report on a discussion on December 23, 1958 at Paris when Oort, chairman of the EC, discussed this participation with Danjon and Fehrenbach in the company of the French government representative Bayen [26]. The decision to incorporate the GPO into the ESO project was taken at the EC meeting of mid-July 1960. As described in article II, at that epoch plans for the Marseilles project had advanced to the stage where the choice of its location became desirable.

At the July 1960 meeting of the EC Fehrenbach presented three possibilities and the related financial schemes: (a) Execution of the project without financial involvement of ESO, in which case it would be located in a town in the Southern Karroo offering logistic help but of no interest for ESO; (b) Execution at Zeekoegat, one of the potential sites for ESO, requiring financial support from ESO for various technical provisions; and (c) Incorporation of the project into ESO, implying financial contribution of ESO for these services and future ESO ownership of the telescope and associated equipment.

The French delegation at the meeting expressed strong preference for the last one of these possibilities as it would strengthen their efforts to persuade the French government to participate in ESO. The costs of the instrument already expended should be considered as part of France's first financial contribution. (The costs mentioned on this occasion were 330,000,– Francs; the amount of 60,361.96 US dollars was mentioned in the context of French payment at the July 1963 meeting of EC.) Delegates from most of the countries represented at the July 1960 meeting were in favour of the proposition for a variety of reasons: the GPO was considered a valuable asset to ESO; it opened the possibility to soon undertake an international research programme; and it would contribute to the site tests. At Heckmann's proposal, the meeting resolved that the GPO would be considered as one of the instruments belonging to the "initial programme" of the – still unsigned – Convention.

The observational programme conducted by the Marseilles Observatory at Zeekoegat was concluded at the end of 1965. A series of publications by Fehrenbach and his collaborators M. and A. Duflot, A. Florsch and N. Carozzi in the Communications of ESO Nos. 1–7 over the years 1962–1966 are based on this work with the GPO. The mechanical parts were then shipped to Chile and the optics returned to France for overhaul. After the telescope had been assembled and mounted in its dome on La Silla, it resumed its work with results that soon turned out to be of superior quality due to the better observing conditions on the new site.

The Astrolabe

Among the tasks delegated to the IC was the definition of the instrument for positional astronomy. Initially, a meridian circle was the obvious choice, but meanwhile other observatories undertook such projects [27]. This led the relevant Working Group of the IC to modify the proposition and suggest at the June 1962 meeting of the IC the acquisition of an astrolabe.

A modern version of the astrolabe had been developed by Danjon and put to use at several French and other observatories. It has turned out to be a very useful instrument as it avoids to a large extent the systematic errors inherent to the meridian circle. Its limitation was in the restriction to bright stars, but for the main purpose, the improvement of the fundamental system with all-sky coverage, this was no serious drawback. The Dutch foundation ZWO possessed a Danjon astrolabe, left over from geodetical work in the Geophysical Year, and offered it for half the price [28].

In a letter of June 7, 1962 B. Guinot, head of the Astrolabe Service of the Paris Observatory and member of the Working Group, suggested to the EC that this astrolabe be made available for ESO [29]. As ESO's planning at that epoch was still in terms of South Africa, a location near the French station at Zeekoegat was envisaged. The switch from meridian circle to astrolabe was endorsed by the EC, and the acquisition proposed in the budget for 1964 as discussed at its February 1963 meeting [30]. By that time, however, the probability of establishing ESO in Chile had become so strong that the site remained uncertain for a while.

Once the decision in favour of Chile had become final, an interesting solution emerged: a collaborative agreement between ESO and the University of Chile, by which the astrolabe was to be installed at Cerro Calán Observatory near

Santiago. The agreement dates from 29 April 1965 [31]. ESO provided the astrolabe with chronograph equipment and a building to house the instrument, and the University of Chile its chronometric facilities. But most important: the observations would be conducted and supervised by the staff of Cerro Calán. After overhaul in Paris, the instrument was installed on Cerro Calán in November and December 1965 with the collaboration of Guinot. Since then it has made, under the supervision of F. Noël, solid contributions to the Fundamental Reference System in the Southern Hemisphere and to research on the Earth's rotation; a first demonstration of the appreciable systematic errors in the southern FK4 declinations was published by Anguita and Noël in 1969 [32]. In ESO Bulletin No. 4 of June 1968 Noël describes the nature of the project and the first years of operation.

ESO Chooses its Emblem

Not only heavy tasks kept the ESO Committee busy. After the Convention had been signed, it acquired its emblem for which at the October 1962 EC meeting Bannier presented some designs by the artist Mrs. G.M. Pot. The Committee had no problem in making up their mind; according to the minutes it chose the design "in which the stars show at their best". The emblem's stars – the Southern Cross – still show well, as is apparent from the front page of this *Messenger*.

References and Notes

Abbreviations used:
EC = ESO Committee (the Committee preceding the ESO Council).
ECM = ESO Committee Meeting.
IC = Instrumentation Committee.
EHA = ESO Historical Archives (see the article in the *Messenger* of December 1988).
FHA = Files Head of Administration at ESO Headquarters.

[1] Circular letter by Oort to EC members preparatory to the ECM of May 1959, in EHA-I.A.1.9., and minutes of that meeting.
[2] See letters of Oort to Danjon and Funke of May 30, 1962, in EHA-I.C. 1.1.c.
[3] In EHA-I.C. 1.1.d.
[4] In EHA-I.C. 2.1.g.
[5] See correspondence between ZWO and University of Groningen in the years 1962 and 1963 in EHA-I.C. 2.1.e.
[6] Information provided by the Personnel Department of ESO; also: minutes of the ECM of July 1963, p. 12.
[7] *Publ. Astron. Soc. of the Pacific* **72,** 225, 1960.
[8] I.S. Bowen, *Publ. Astron. Soc. of the Pacific* **62,** 95, 1950.
[9] I.S. Bowen, *Publ. Astron. Soc. of the Pacific* **61,** 243, 1949.
[10] Jahresberichte Hamburger Sternwarte 1954 and 1955; *Sky and Telescope* **15,** Nov. 1955, p. 10.
[11] See, for instance, minutes ECM of Oct. 1957, June 1961, Oct. 1962, Nov. 1963, Council Meetings of May 1964 and April 1966 and correspondence between Fehrenbach, Heckmann and Oort of June 1964 in EHA-I.A. 2.9. and I.A. 2.10.
[12] Minutes ECM of April and Oct. 1957; the EHA do not contain the written report.
[13] In EHA-I.C. 1.9.c.
[14] In EHA-I.C. 1.9.a., Visite des Observatoires Américains.
[15] Minutes ECM of November 1961.
[16] See, for instance, the letter by Blaauw to Fehrenbach of April 6, 1961 in EHA-I.C. 1.9.c.
[17] EHA-I.C. 1.9.c.
[18] See letter by Minnaert to Oort and Blaauw of May 1, 1961 in EHA-I.C. 1.9.c.
[19] See Minnaert's letter to Van Geelen of 10 October 1961 in EHA-I.C. 1.9.c.
[20] Maps EHA-I.C. 1.9.f/k contain preparatory correspondence, technical descriptions, and the tender of Rademakers.
[21] Minutes IC of November 1961.
[22] See ref. No. 18.
[23] Minutes ECM of June 1961.
[24] Minutes ECM of November 1961.
[25] EHA-I.C. 1.9.e. contains the Cahier de Charges with drawings and the Marché de Gré à Gré of REOSC of May 20, 1963.
[26] In EHA-I.C. 1.1.c. See also correspondence between Fehrenbach and Oort of October 1958 in EHA-I.A. 2.1.
[27] The Yale and U.S. Naval Observatories planned an instrument in Argentina and the Pulkovo Observatory one in Chile, whereas Greenwich Observatory contemplated a collaborative project with the Cape Observatory and Hamburg Observatory one with Perth.
[28] Minutes Council Meeting of May 1964, p. 10.
[29] Letter by Guinot to Blaauw and follow-up correspondence with Van Geelen in EHA-I.C. 1.9.d.
[30] EHA-I.A. 1.19. and I.A. 2.6.
[31] ESO Ann. Report 1965, p. 10.
[32] *Astron. Journal* **74,** 954. 1969.

Field Strömgren Photometry with a CCD

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Introduction

The chemical evolution of the Galaxy is somehow coupled to its formation. The location of stars with a certain metallicity may therefore also depend on the Galaxy's dynamical history.

Laws describing the galactic distribution of the various stellar populations introduced to understand the construction of the Galaxy are often based on detailed studies of the solar vicinity. We have been interested in studying particularly the F stars in a few galactic directions of interest, e.g. the SGP, to search for [Fe/H] gradients in space and time. Such studies are mostly based on accurate photoelectric photometry but the cry for data in more remote volumes has been acute lately and as large telescopes are not available for extended photometric surveys we have tried to use a medium sized telescope with a CCD instead.

Stars with a metal content down by a factor of 2.5 relative to the Sun have been suggested to form a spheroid with a local scale height in the range from 600 to 1 000 pc and the stars with [Fe/H] ≤ -0.8 another system with a scale height of several kpc. Strömgren photometry of F stars seems well suited to trace the metal variation with age and distance. The intermediate band photometry thus permits computation of distances based on individual absolute magnitudes. Distances based on a colour – absolute magnitude relation as $(b-y)_o - M_V$ may be quite uncertain. For an F star with $(b-y)_o = 0.3$ the width of the main sequence band is observed to be 2 mag at least. The scale height of the most metal poor stars thus suggests that observations of objects several kpc from the plane should be performed.

According to current models of the Galaxy, it is only several kpc from the plane that extreme population II stars will dominate. Our observing parameters are set by the detection of an F9 star 5 kpc from the plane. The V magnitude is about 18 at this distance. The most critical colour is, however, the u-band, partly because the F stars are cool and partly because this band falls in the wavelength range where the CCD's R.Q.E. is smallest, only 10 to 20%. The stellar metallicity may be computed without u but the band is required for estimating M_V. An F9 star has $(b-y) = 0.4$ and $(u-b) = 1.5$, $V = 18$ then implies that