

1991, INTERBETON will establish a base camp for the temporary housing of its personnel in the hostile desert surroundings, and the actual blasting will start in September 1991. It is expected that this work will be terminated in February or March 1992, after the removal of no less than 250,000 m<sup>3</sup> of rock and gravel.

COWIconsult will perform an in-depth engineering design study of all the

structures and buildings which will later be erected at Paranal as well as of the optimal lay-out of the necessary access roads and also the entire infrastructure. The Paranal site is one of the most pristine in the world and ESO is placing great emphasis on the need to preserve it in a condition that is as close to the original as possible. The COWIconsult study will therefore include the innovative use of alternative sources of energy,

for instance wind turbines and photovoltaic solar cells for providing electricity and thermal solar cells to heat the buildings. Water tanks must be provided to store the water which will be trucked from Antofagasta to this absolutely dry, remote location. This study will take about 12 months, following which the actual construction work will begin in the second half of 1992.

*The Editor*

## ESO'S EARLY HISTORY, 1953–1975

### XI. Policy, Payments and a Bit of Politics\*

#### A. BLAAUW, Kapteyn Laboratory, Groningen, the Netherlands

*“German astronomers would be very happy if in the long run not only the [ESO] Administration, but also scientific activities could be located in our country”.*

From a statement by the German astronomical Council delegate in December 1973.

#### Introduction

The present article concludes my account of ESO's early history. We first followed the developments leading to the signing and ratification of the ESO Convention in 1962 and 1964, and the simultaneous searches for sites, first in South Africa and later in Chile; next the first phase of constructions in Chile concluded with the dedication ceremonies on La Silla in March 1969, and then first scientific activities. We saw that by the time of the dedications first thoughts were given by Directorate and Scientific Programmes Committee to developments of ESO beyond the Initial Programme of the Convention, but that their follow-up was stifled by the growing concern about the completion of the 3.6-m and the Schmidt telescopes. Subsequent progress in these two telescope projects was described in the last three articles.

In dealing with these latter subjects, I entered into the period of my own Directorate of the Organization. As a matter of principle I did not want to cover that period except for those items for which developments were well under way in preceding years and hence would naturally ask for an account of their follow-up, as was the case with the 3.6-m and Schmidt telescopes. Thus, my account did not cover a wide range of developments following the 1969 dedications, such as: the scientific work by ESO staff in Chile and by visiting astronomers; the large construction programmes carried out in Chile; the more detailed account on the work of the TP Division; and the

steadily progressing effort of the ESO Administration and Finance Committee in establishing the framework of rules and arrangements governing staff positions.

This concluding article will again deal with two subjects that rooted in ESO's earliest days. First, we take up some matters of general policy that were on and off the subject of, sometimes rather pithy, discussion. Next we shall deal briefly with an important aspect that so far was hardly touched: the financial one – what it all cost and how it was paid for.

#### MATTERS OF POLICY

Two matters of policy ran, since the earliest days, as a continuous thread through the deliberations of Directorate and Council: a) the question, to what extent ESO should have a nucleus of research-oriented astronomical staff, and b) the problem of ESO's geographical dispersion, particularly the dispersion in Chile. Although the two subjects are interrelated, let me deal with them consecutively.

#### A. ESO, A Centre for Research?

In article VII I quoted the opening statement by the advisory committee that in 1965 submitted to Council recommendations on the way the Observatory should operate: *“Whereas the role of the Observatory as an astronomical institute in its own right – – – should be of great importance, the facilities should particularly be available to serve the national interests of the member states”*. We recognize here two conceptions between which the Organization

swung since then, a role as *“observatoire de mission”* and one as a research institute in its own right. I referred to this ambiguity earlier, in article VI in connection with the creation of the Santiago Headquarters.

In 1968, as described in article VII, the newly created Scientific Programmes Committee proposed the creation of an ESO Centre in Europe, to serve a double purpose: offering a meeting ground for astronomers, and a place where auxiliary measuring equipment could be developed, to be used in conjunction with the observational work on La Silla. As we have seen, this suggestion as well as others of the SPC met little response when early in 1969 the problem of the realization of ESO's main telescopes began to dominate Council deliberations. However, the proposal contained elements that in the following years would recur with increasing urgency in discussions between Directorate and Scientific Policy Committee on the one hand, and Council on the other hand.

The matter was expressly brought up in part II of document Cou-60 of December 1969 (to the first part of which I referred in article IX), written in preparation for the new policy to be adopted for the realization of the 3.6-m telescope and resulting in preference for the collaboration with CERN. With the prospect of the strong technical group to be built up at CERN that would absorb anyhow the small but growing technical group at Hamburg-Bergedorf, and with the threatening dispersion of ESO's establishments in Europe (on top of that in Chile), it seemed attractive to move to the vicinity of this technical group also the other services of Hamburg and es-

\* Previous articles in this series appeared in the *Messenger* Nos. 54 to 63.



**The ESO Guesthouse in Santiago from the air**

*The Guesthouse was bought in the year 1964 as a pied-à-terre in Santiago and served in the early years for both the administrative offices and for lodging visitors from Europe. In the early 1970's it was contemplated to sell the Guesthouse and incorporate its function for visitors into the Vitacura Headquarters building. The idea was not, however, pursued any further. From photograph in the EHPA.*

establish there the ESO Centre suggested in earlier proposals. Naturally, there was the difficulty that Switzerland was not yet a member of ESO, but efforts to achieve this were under way. An obvious advantage of such a move would have been the opportunity for natural interaction between the three astronomical groups: that in Europe involved with the visiting astronomers programme, the astronomical staff at the TP Division, and astronomers from Chile visiting Europe. Also, favourable conditions would be created for further pursuing the Scientific Programmes Committee's proposals for a new generation of telescopes referred to earlier.

As was reported in article IX, Council in December 1969 encouraged the further exploration of collaboration with CERN for the large telescope project and this eventually led to the creation of the TP Division. The question of the ESO Centre was, however, referred to a special advisory committee Council intended to create for dealing with matters of general policy [1]. As we saw in article IX, the French delegation at that time stressed the importance of first of all concentrating all efforts on the construction of the large telescope. Reluctance with regard to the coupling of the telescope project and a "Centre" was more specifically heard from the side of the German delegation: *"The central ESO institute is some sort of ghost going around. --- As long as --- a study is not available, we have to sepa-*

*rate the two questions: --- the large telescope and the central institute"* [2].

### **The Scientific Policy Committee Created**

The special advisory committee just mentioned, to be called Scientific Policy Committee, was created in the Council meeting of June 1971 and meant to advise Council on matters brought up by Council as well as such it might take up on its own initiative [3]. The Council meeting of December 1, 1971 appointed its membership: Ludwig Biermann, Jean-Claude Pecker and Bengt Ström-gren, with the latter as its President. The acronym SPC would henceforth refer to this new committee, and the former SPC became Observing Programmes Committee (OPC). President of this latter became Pol Swings. The meetings of both committees up to the end of 1974 are listed in the table on page 25 of *The Messenger* No. 60 (article VII). This new SPC, with its small membership, soon became a welcome sounding-board for the Director General when it came to matters of general policy.

Meanwhile, the matter of the ESO Centre had remained more or less dormant in 1970 and 1971. These were not only the years in which the TP Division took up its task; the ESO Directorate also was confronted with increasingly serious economic problems in Chile that required a variety of measures in the personnel sphere [4].

### **A Research-Oriented Group at ESO?**

The question of the Centre was taken up by the (new) SPC in its meetings of April and October 1972, at the last one on the basis of a proposal submitted by the Directorate: "Preparation for the Optimum Use of the 3.6-m Telescope" [5]. In the course of that year, with the work of the TP Division in progress, it had appeared desirable to take first steps towards ensuring that the astronomical community in the member states would be prepared for making full use of the large telescope, once this would become operational. It was not obvious that this would be the case. For instance, research with the large telescope might be expected to concentrate mostly on extragalactic problems, i.e. the study of stellar systems outside the Milky Way system, whereas around the year 1970 research on our own system, the Galaxy, dominated observational work [6]. The proposal received strong support from the SPC in its October 1972 meeting and could be summarized as follows [7]:

*"1) ESO aims at creating without delay a small group of astronomers with the task*

*– a. to help orienting research in the ESO member-states towards those programmes, to which the 3.6-m telescope may be applied with its optimal efficiency;*

*– b. to help orienting the development of auxiliary instrumentation towards the application of these programmes;*

*2) The group should have a small nucleus of permanent or semi-permanent members, and for the remainder consist of a rotating membership (visiting scientists)."*

The group was meant to be located preferably at the TP Division; it was proposed that budgeted provisions be made for three first appointees, and that it should be guided by a senior astronomer of outstanding qualification [8].

The Committee of Council in its meeting of October 31, 1972 was in majority favourable to these ideas and amended the proposal in the sense that leadership of the group might be combined with the still vacant position of Deputy to the Director General which had been created in connection with the retirement of Ramberg at the end of 1971 [9], and a correspondingly amended proposal was submitted to Council [10]. The amended proposition seemed particularly interesting because by that time an astronomer of outstanding qualification had, in private, expressed to the Director General interest in this leadership. However, contrary to expectations

raised at Committee of Council, the Council meeting of November 1972 held in Chile acted reluctantly. It authorized the Director General to approach the person concerned about the intended association with ESO, but rejected creation of the research-oriented group [11]. As a result, interest on the part of the person concerned faded.

### The Workshop Proposal

The question of the orientation of research with the 3.6-m telescope was again on the agendas of the SPC meeting of March 28, 1973, and of Committee of Council on the day following. This had been preceded by consultation of the President of the SPC and the Director General with a prominent astronomer in the member state from where much of the resistance appeared to stem, the German Federal Republic, and this had led to an alternative suggestion: instead of creating the research-oriented group within ESO, ESO might “--- organize a succession of Workshops, each of about 6 months duration, with participation of astronomers from astronomical institutes of the ESO countries, who would be on leave of absence from their home institutes for the duration of the Workshop. ---” [12]. Although it was realized that in this way the most urgent task Directorate and SPC had in mind, working out a programme for the auxiliary equipment for the 3.6-m telescope, would not be taken up as expediently as in the original proposal, Committee of Council recommended the Workshop proposal to be worked out in detail by the Directorate, especially for its financial implications.

A second meeting of Committee of Council followed soon, on May 18, 1973

in preparation for the June Council meeting. The fact that, in this case, two meetings of this Committee preceded the Council meeting reflects the concern about developments felt by the Directorate as well as by the SPC. This concern found its expression in a rather extensive document, Cou-142, prepared by the Directorate: “Notes Concerning some Imminent Problems and Related Matters” of May 10, 1973 [13]. With the termination of the current terms of appointment of the Director in Chile (per June 1974) and of the Director General (per January 1975) in sight, the document reviewed, more broadly than had been done before, developments within ESO that required early adjustment or clarification. It paid special attention to certain aspects of the Office of the General Directorate and to ESO’s geographic and organizational structure, including the suggestion that part of the astronomical activities in Chile might be incorporated in the establishment in Europe.

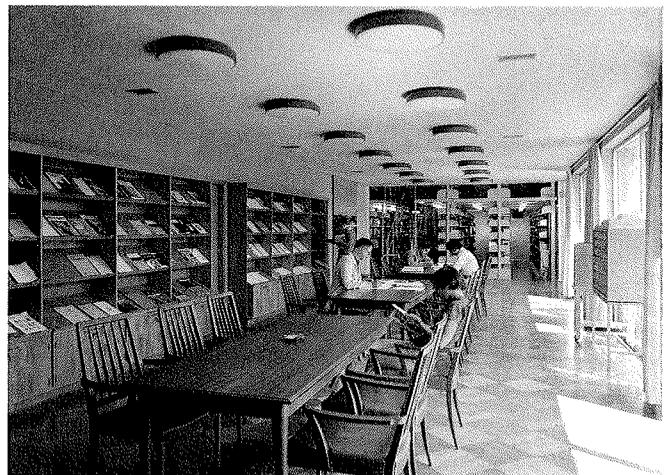
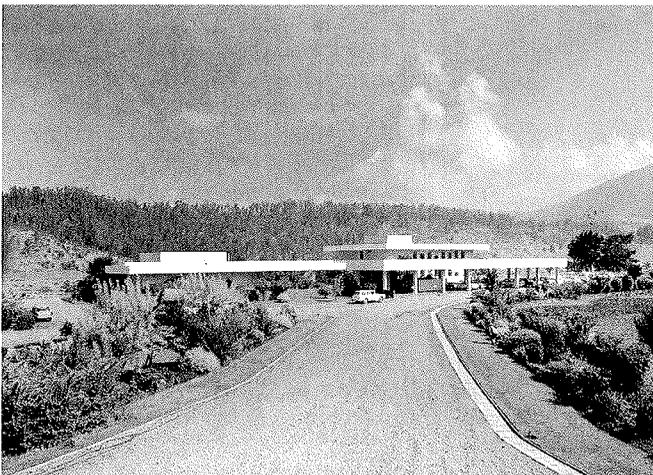
Most of the extensive discussion in the Council Meeting of June 5 and 6, 1973 was devoted to these problems, both on the basis of an extensive report of the Chairman of the SPC, B. Strömgren, and in reaction to the above-mentioned document, Cou-142. There was uneasiness about the Workshop proposal. However, with the prospect of a review of ESO’s entire structure, no final conclusion was reached and the Directorate was requested to submit to Council “--- proposals and possibly alternative proposals on the future role of ESO in encouraging and organizing cooperation in research in the Member States, and in promoting the development and construction of the auxiliary instrumentation ---”; this study “---

to be used for the preparation of decisions on the future structure of the Organization. ---”.

At this meeting, the SPC was strengthened by the appointment of Lodewijk Woltjer as its fourth member, and broad consultation with astronomers in the member states was encouraged [14].

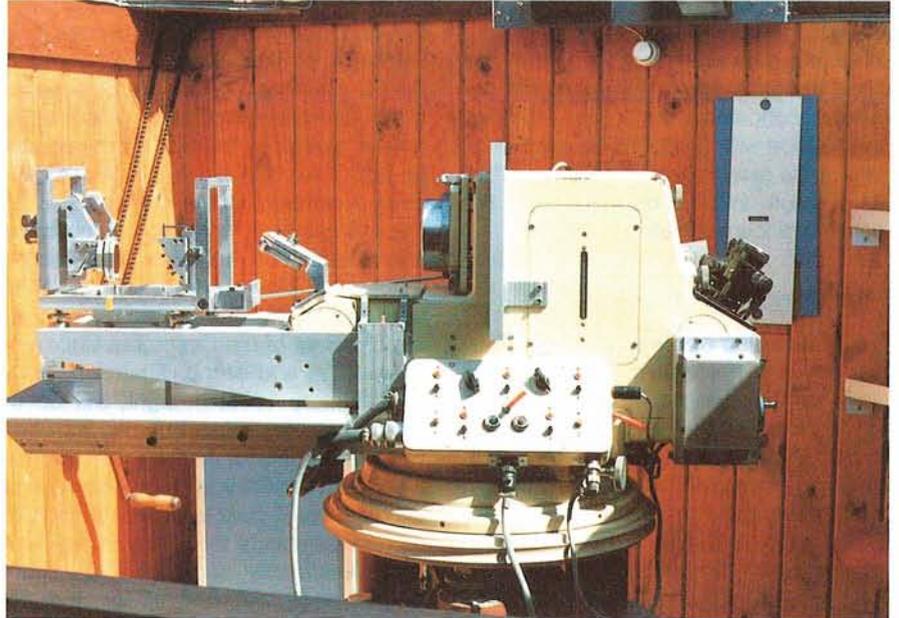
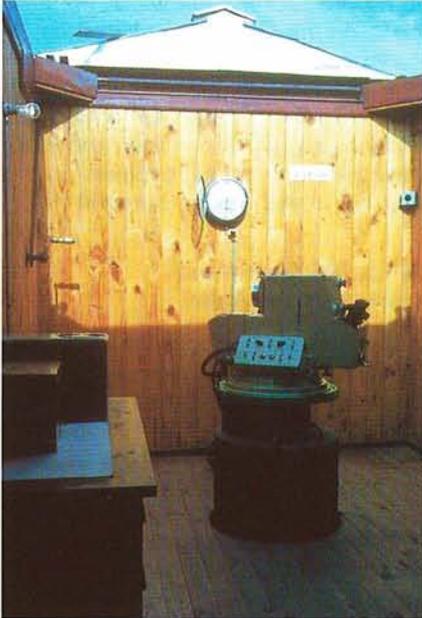
### A Formal Statement from German Side

Besides the above necessarily very condensed account on these deliberations on general policy in the middle of 1973 (in fact, too condensed to reflect the range and depth of the discussions), we must record an initiative that would turn out to have far-reaching consequences for ESO. It was at this Council Meeting of June 1973 (as well as at the preceding meeting of Committee of Council), that a remarkable formal statement was read by the German delegate. After referring to the “*observatoire de mission*” concept favoured from German side, the statement, apart from other items, expressed the opinion that with the completion of the 3.6-m telescope ESO’s activities would be mainly in Chile, including the office of the Director General. However, as to the services then left in Europe, it said “--- if ESO feels the necessity to put its European office at Hamburg in a stronger position, --- I am authorized to state: My government is ready to give all its support to hosting ESO in the Federal Republic of Germany under optimal conditions, thus promoting the European cooperation which is one of our principal aims ---” [15]. At the meeting of Committee of Council preceding this Council meeting, the President of the SPC, Strömgren, had shown particular interest in this



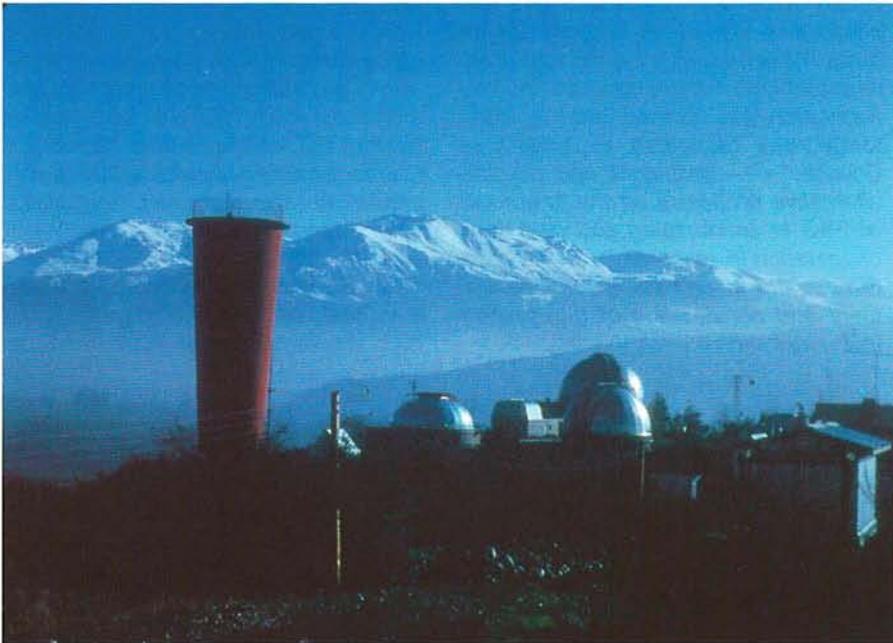
### ESO Headquarters in Santiago

After the dedications in Chile in 1969, the Headquarters in Santiago housed the administrative services and assumed an increasingly important role in ESO’s activities in Chile. In these photographs: at left: the Headquarters building seen from the entrance gate; at right: the reading room in the library with in the foreground, at left and right, astronomers François and Monique Spite. From photographs in the EHPA.



### The ESO Astrolabe at Cerro Calan Observatory

Since its installation, at the end of 1965, at Cerro Calan Observatory of the University of Chile, the Astrolabe has been in regular operation. Under the supervision of C. Anguita and F. Noël it observed, among other objects, the stars in the FK4 Catalogue which embodied the fundamental reference system of stellar positions, and it contributed important improvements to this system. The collaborative agreement between Cerro Calan and ESO dates from April 29, 1965; by this agreement, the desire expressed in the ESO Convention for ESO contributing to positional astronomy was fulfilled. The above photographs show: at left, the astrolabe in its removable covers, and at right, after the covers have been taken away. The photograph below shows Cerro Calan Observatory, in the outskirts of Santiago, with the Astrolabe housing in the lower right. These photographs were kindly made available by Dr. F. Noël.



statement and expressed the hope that the proposition might be studied in depth in connection with the problems presented in Doc. Cou-142 [16].

### Response by Directorate and SPC, Doc. Cou-150

In response to Council's request the Directorate submitted by the end of 1973 an extensive recommendation, Doc. Cou-150. Annexed to it were "Con-

siderations by the Director General" as well as supporting reports on behalf of the SPC and the Instrumentation Committee, and Notes by the Director in Chile. The SPC had thoroughly discussed the items raised in document Cou-142 at its meeting of September 14; it had invited for this, apart from its membership (Strömgren, Biermann, Pecker und Woltjer) also the Chairman of the IC, J. Borgman, and B. Gregory, former Director General of CERN and now Direc-

tor of CNRS, and R. Lüst, President of the Max-Planck-Gesellschaft.

Among its main items document Cou-150 supported the Workshop Programme, however for the organization and follow-up it recommended establishing a small group of ESO staff astronomers that would also incorporate the Visiting Astronomers Service (the organization of the observational programmes in Chile), and that should closely collaborate with the TP Division. Furthermore, it strongly recommended [17]:

*"I. To consolidate the activities of ESO in Europe by removing the present activities at Hamburg to Geneva during the 5-years period [required for the completion of the work of the TP Division]:*

*II. To review before the end of this 5-years period – preferably within the next 2 years – the question of the location of the consolidated headquarters in Europe on the basis of ESO's scientific purposes."*

### Council's Resolution December 1973; the German Offer

Thorough deliberations of Council in its meeting of December 13-14, 1973, partly in closed session, resulted in a long and detailed formal resolution [18]. It supported the Workshop Programme but wished it to be executed by Visiting

Scientists on leave of absence from (preferably) European institutes instead of the proposed nucleus of ESO staff. It did, however, recognize the importance of simplification of the structure of ESO and in this connection *“Gratefully acknowledge[d] the possibility offered by the German Government to establish the Headquarters as well as other facilities of the Organization in the neighbourhood of German astronomical and technological establishments ---”*. It requested the Director General to *“study the offer of the German Government as well as any other proposals which might emanate from Member States for the Organization’s Headquarters and other facilities in Europe.”*, and *“to make proposals for a provisional transfer of his office, or part of it, to the site of the TP Division ---”*.

The German offer referred to in this resolution had meanwhile become more explicit than half a year earlier. A statement by the German astronomical Council delegate reported positive reactions among German astronomers (including the Rat Westdeutscher Sternwarten) with regard to the recommendations in document Cou-150, but added: *“German astronomers would be very happy if in the long run not only the [ESO] Administration, but also scientific activities could be located in our country”*, and specifically mentioned the possibility of an establishment in conjunction with the astrophysical institutes at Garching near München. More explicit statements were presented by both the Government delegate on Council and a representative of the Foreign Ministry of the Federal Republic, who especially for this item joined the German delegation. According to the former *“--- it was necessary to distribute research organizations fairly throughout Europe, --- avoiding a concentration of efforts in one place ---”*, reasons why *“the German delegation had been instructed to say that part of the proposal presented was difficult for the German Government to accept.”* The representative from the Foreign Ministry, after referring to the effect of the choice of a site on public opinion, added *“--- all the more so when so few international organizations are located on [our] territory”*, and concluded with *“My Government, therefore, would be grateful if ESO were to accept the offer of a suitable site in Germany.”*

### The Political Aspect

Clearly, for the German delegation the question of the location of the future centre of ESO had grown to include more than just the interest of ESO itself:

it had a political aspect. Whereas nearly all European organizations had their headquarters outside the GFR, notably in Geneva, Paris, Brussels, Rome, etc., there were very few within the GFR notwithstanding the fact that the GFR was one of the main financial contributors. With ESO’s administrative headquarters and some related services having been in the GFR since their creation, it had become a concern at government level not to let ESO also drift to other territory. With astronomy at large gradually entering the era of “big science”, ESO, too, unavoidably entered the domain of political attention.

### The Year 1974: the Centre in Sight

During the year 1974, a variety of measures in Chile absorbed a good deal of the managerial capacity of the ESO Directorate. An interim report on the implementation of the Council resolution, presented at the June 1974 meeting of Council, revealed that no alternative offers for sites for the European Headquarters were to be anticipated from Denmark, Sweden and the Netherlands, and the German offer had been the subject of consultation between the Directorate, the SPC and the Max-Planck-Gesellschaft. A study of the temporary transfer of Hamburg facilities to Geneva was under way [19]. A promising step towards orientation of research with the 3.6-m Telescope, had been the successful ESO/SRC/CERN conference

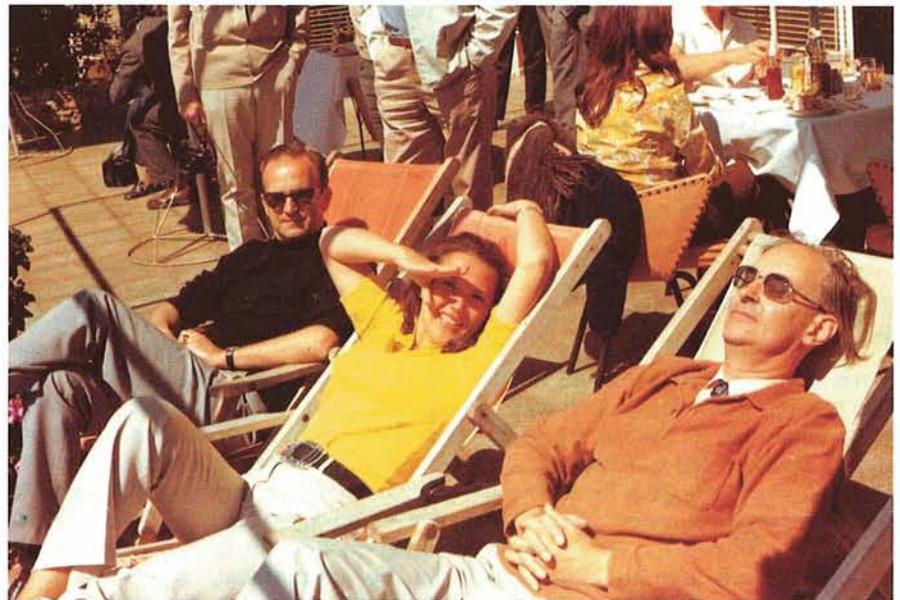
on research programmes, held at CERN on May 27-31, 1974 [20].

Naturally, by this time, mid-1974, many of the measures had to be viewed in anticipation of the succession in the General Directorate per 1 January 1975. Meanwhile, two important future developments began to stand out: a temporary enhancement of the role of the TP Division by the incorporation of services so far located at the Hamburg Office, and the prospect of the creation of a comprehensive and representative Headquarters near Munich.

By the end of the year, the views of the new Director General, Lodewijk Woltjer, had firmly put their stamp on further planning, as is apparent from the following quotation from the minutes of the meeting of Committee of Council of November 1, 1974 *“--- B. As to the creation of an astronomical Centre in Europe, which had been made a condition by Professor Woltjer for his acceptance of the position of Director General, --- a course of action would seem to be acceptable --- which would comprise the following: 1) In the frame of the 1975 budget, --- to start recruiting a nucleus team for the astronomical centre. ---”*. The Centre was envisaged to be established temporarily on the premises of CERN [21].

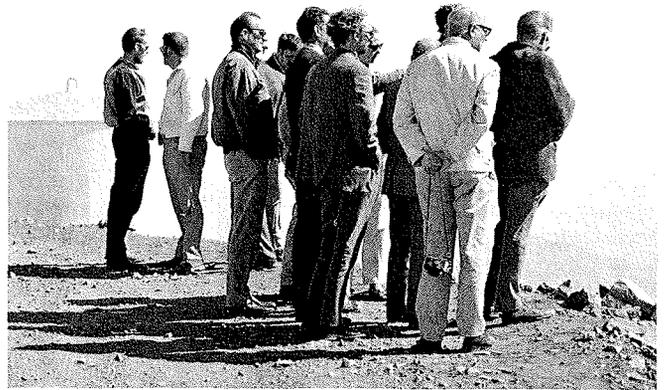
### B. ESO’s Geographical Dispersion

From the time when, in March 1969, the dedications in Chile concluded the first phase of constructions and the Headquarters in the Vitacura suburb of



#### Bus Stop at Los Vilos

Early October 1971 the ESO Finance Committee held its (21st) meeting in Chile (its second one in that country). As was customary in those days, the trip from Santiago to La Serena was made by bus, with a lunch stop at Los Vilos or Pichidangui in flowery surroundings at the coast. Shown here, during a moment of post-lunch relaxing, from left to right: C. Zelle (President Finance Committee), Hedwig Geier (Secretary of Director General), and the author.



### Finance Committee in Chile

In October 1971 Finance Committee made itself acquainted with developments on La Silla, in La Serena and in Santiago. In these photographs, taken on La Silla, from left to right:

Left photograph: Miss H. Geier (Secr. of Dir. Gen.), H. Grage (DK), C. Zelle (GFR; partly hidden behind Grage), B. Samuelsson (S), A. Blaauw (Dir. Gen.), H. Dumont (F), P.A. Berniard (F).

Right photograph: M. de Groot and H.-E. Schuster (ESO astronomers), and in the front row C. Zelle (GFR), H. Dumont (F), H. Grage (DK), P.J. Fierst van Wijnandsbergen (NL), B.E. Westerlund (ESO Dir. Chile).

From photographs in EHPA.

Santiago assumed its functions, the La Serena Office became of secondary importance but it remained indispensable as a base for the La Silla operations. Besides these three Chile components, there were the Guesthouse, also in Santiago not far from the Headquarters, and at the base of La Silla the Pelicano complex of storehouse and services, in use since the very first construction activities for La Silla. Visitors from abroad wondered at this multitude of settlements, and it is not surprising that members of Council and Finance Committee on the occasion of their visits to Chile critically enquired whether not the situation implied inefficient use of manpower and finances. We have seen in article VII that, indeed, in 1969 this was one of the items of review by the Working Group of Funke, Alline and Scheidemann; however, the Group refrained from recommending changes.

### Extension of Facilities in Chile

The question of the structure in Chile was brought to the foreground again in 1972, when the TP Division's activities had to be extended to Chile: the construction of the building and dome for the telescope, and related auxiliary and support constructions (for instance, lodging facilities for the construction workers). In addition to this, an extensive (and expensive) programme lay ahead for providing facilities required for the operational phase with its increased observational activity. A comprehensive scheme, drafted in collaboration between the TP Division, the Directorate in

Chile and the General Directorate was submitted to FC and Council in April 1972 [22].

This scheme foresaw, besides constructions in La Serena and on La Silla, also extension of the Headquarters in Santiago, but Council in its meeting in June 1972 considered that this could not be separated from the long-range policy for the establishments in Chile: "whereas from the beginning it was decided to create in Santiago the Headquarters --- and this policy of Council was maintained for almost 15 years, in recent times the question arose whether, indeed, there are not disadvantages in having these establishments so far from La Silla and whether not the operation of the Observatory is hampered by the remoteness of the facilities in Santiago. ---" [23]. Decisions on the building programme were postponed until, in November of the same year, Council would judge matters in situ during its visit to Chile.

At this November, 1972 meeting important moves were made indeed toward the extension of facilities in Chile. In La Serena, land was to be purchased next to ESO's Las Cisternas compound for the construction of more housing of ESO staff and a technical office was to be added; in the La Silla - Pelicano area, living quarters for local personnel were to be constructed, and workshops, storehouses and service stations were to be moved to La Silla. The proposed extension of the Santiago Headquarters, however, was not granted and it was contemplated to sell the Guesthouse and have it incorporated in the Headquarters establishment at Vita-

cura. Transfer of the Headquarters or part of it to La Serena was not favoured for the time being, in view of the increased activities now expected in the La Serena area [24]. Also, at this time, in the context of proposals for the ESO Centre, serious consideration was given to the proposition that part of the Vitacura services be moved to Europe [25].

### Moving "Vitacura" to La Serena?

An important next step was, a year later, the recommendation by the Director General and the SPC of November 1973, in Document Cou-150 to which we referred before. With regard to the integration within Chile it recommended to further investigate "the advantages (respectively disadvantages) and financial implications of a move of the Vitacura establishment to La Serena, in order that by the time the 3.6-m telescope comes into operation (medio 1976) the optimal geographic structure in Chile may be attained" [26].

Naturally such a move would have far-reaching consequences for the work and the living conditions of ESO's staff in Chile. The views of ESO's Director in Chile, B.E. Westerlund, presented in the preparation of Cou-150, were included as Annex IV to this document. As a result of his balanced weighing of the advantages and disadvantages of a move, Westerlund concluded: "Summarizing today (27. 10. 1973) my feelings on Santiago versus La Serena I conclude that if ESO makes an effort to solve [problems concerning schooling, medical assistance and cultural environ-



**Visit to President Allende**

On the occasion of Council's visit to Chile, in November 1972, a delegation from ESO paid a visit to the President of the Republic of Chile. The top photograph shows President Salvador Allende talking to, from left to right: A. Alline, President of the ESO Council; A. Blaauw, Director General of ESO; C. Zelle, President of Finance Committee; B.E. Westerlund, Director of ESO for Chile; and (seen from behind) B. Strömgren, President of Scientific Policy Committee. Bottom photograph: A. Alline presenting President Allende with a collection of pictures of ESO.



conditions in Chile seemed unpredictable.

The Council meeting of December 1973 requested the Directorate to prepare specific proposals for restructuring in Chile and redistribution of tasks between Chile and Europe [27].

**The Year 1974:  
Restructuring in Sight**

Restructuring in Chile was pursued in 1974 but at a slow pace due to the special circumstances that developed in this country, and also because views of the new Director General would more and more have to be taken into account. The minutes of the Council meeting in June of this year reported: "Regarding a transfer of the Vitacura facilities, studies were under way with a view to finding an adequate alternative site at La Serena. Certain contacts had been made with the local government official concerned (Intendente) during the spring of 1974. Any further negotiations would be conducted probably on the Foreign Ministry level. There would be the question of construction costs and of social implications, including the provision of school and medical facilities. --- For

ment], most staff will see a move with calm. If it is worth from an economical and PR view, I do not know. With "normal" time returning to Chile in the future, I doubt it." These latter words remind us

of the facts that economic conditions in Chile in the course of the past years had strongly deteriorated, that six weeks before Westerlund wrote this letter the coup d'Etat had taken place, and future



#### La Silla on Chilean Post Stamp

On April 25, 1973 Chile issued a post stamp depicting the 1-m Photometric Telescope with part of La Silla in the background. On the artist's sketch we recognize the flattened top on which the 3.6-m Telescope was to be erected and, in front of it, the Schmidt telescope building and part of that of the GPO. Photographed from a leaflet describing the Observatory, issued by the Dirección Nacional de Correos y Telecomunicaciones de Chile, and carrying the First-day-of-issue stamp. (Property of the author.)

the further improvement of communications, particularly in circumstances where rapid transport was required, an air-strip was being constructed at Pelicano under a recent Council decision. --- " [28].

Giving final shape to restructuring in Chile would be the task for the new Director General. Drastic measures were in the air, including considerable reduction of the role of the Vitacura Headquarters.

#### THE FINANCIAL STORY

Reviewing finances, we distinguish three phases: the pre-Convention period, beginning early 1954 when it was proposed to create ESO and ending early 1964 after the signing and ratification of the Convention, the next one concluding with the dedications in Chile in 1969, and the third one ending in more or less open-ended way in the middle 1970's with the completion of the 3.6-m Telescope Project.

#### The Pre-Convention Period, 1954–1963

These early years called for improvisation. With the Convention still pending, there was no internationally agreed obligation for the governments to provide financial means for preparatory work that could be taken up right away: site tests in South Africa and planning for the instrumentation and first design studies. One wished to go ahead, and fortunately so, for, as we have seen, it took nearly ten years before the Convention was ratified.

Under the supervision of the ESO Committee (the predecessor of the ESO Council), budget estimates were drafted and the funds required were obtained in different ways in the various countries. In the Netherlands and Sweden, the government-sponsored science foundations supported the ESO project on a year-to-year basis, and in other countries ministries of science or their equivalent collaborated; the ESO archives

do not clearly reveal their exact nature. The efforts were co-ordinated and administration was carried by the provisional treasurer J.H. Bannier.

For fixing the shares of the five participating countries after, in an early stage, Great Britain had withdrawn, the following key was used: the Federal Republic and France would pay one third each, with the remaining one third to be shared by Belgium, the Netherlands and Sweden proportionately to their Gross National Incomes (which at that epoch were virtually equal). The system was flexible enough for one or more of the partners to help out with an advance if financial problems arose in one of the other states, and in the years 1958 and 1959, when no financial contributions could be expected from internally disturbed France (see article I), these were bridged by a temporary arrangement by which Germany paid 49% and the other partners about 17% each [29].

Naturally, the lack of financial guarantee was a serious drawback, but on the

other hand, the situation left room for improvisation. Budget estimates made and agreed upon in advance of the fiscal year could fairly easily be adjusted later if developments required so, and in such cases the ESO Committee benefitted much from the authority which members of the Committee carried in their consultation with government officials at home. As a consequence, establishing now the amount of the early contributions from the financial documents left in the ESO Archives is done more by means of *a posteriori* reports than by looking at the advance budget plannings.

### About Dollars and Deutschmarks

The currency in which the budget estimates and, hence, the contributions of the member states were expressed during the first two decades (in fact until 1973) was the US Dollar, with the exception of a brief period in the very beginning when the English Pound figured. The choice of the dollar was a natural one: cost estimates of instrumentation were mostly based on American experience, the dollar tended to be stable and the choice was not biased towards any of the ESO partners. Yet, for the presentation in this article I shall use the Deutschmark, the currency in which ESO budgets nowadays are defined. This gives a better feeling of costs and contributions when compared to those of modern European operations.

For the conversion factors of Dollars into Deutschmarks over the years I used tables provided by the ESO Administration [30]. Until 1970 the rate was about 4 DM per Dollar, during the 1970's it gradually diminished to 1.8 DM per Dollar and rose again in subsequent years. However, using this currency is not enough for the desired comparison; we also must take into account the inflation over the years, i.e. the gradual change (decrease) of the purchasing power of the DM. Where this is done here, it is based on inflation tables also provided by ESO [31]. To give an idea of its importance: in the second half of the 1960's the purchasing power of the DM was about 1.8 times larger than by the time (1976) the 3.6-m Telescope became operational, and it was 2.7 times larger than it is at present (1990). The inflation of the DM has been very smooth; it is illustrated at the bottom of Figure C.

In what follows I shall use the following notations:

– DM for Deutschmark converted from dollars at the rate valid at the epoch concerned;

– dm for Deutschmark adjusted to present day level taking into account the inflation.

The principal source of information used for the present compilation are the reports of the external auditors of ESO. These are agencies, designated in turn from the member states, with the assignment to scrutinize from impartial point of view the financial administration of the Organization. Sometimes their reports also, bring up matters of management. These quite valuable reports form part of the files of the Head of Administration [32]. For the period preceding the ratification of the Convention, for which auditor's reports are not always available, part of the data was derived from the minutes of the meetings of the ESO Committee [33].

### Early Annual Contributions and Project Costs

We first illustrate the development of the total of the early annual contributions of the member states; see Figure A. Here, no corrections for inflation have been applied yet. We see that from 1955 to 1963 the contributions grew from about 100.000 DM to 2 million DM. Integrated over the years ending with 1963 we find a total of 6.8 million DM (17 million dm). During these early years contributions were used partly for the site testing expeditions and for the research programmes carried out in the context of these tests and described in article II:

the Tübingen photometric work and the Marseilles radial velocity project with the GPO telescope. However, a sizeable unspent balance was also built up before the beginning of the post-Convention years; by the end of 1964 it amounted to about 9 million DM (about 22 million dm), including the grant of one million dollar of the Ford Foundation (see article I) which was transferred to ESO in 1964, corresponding to 4.0 million DM (9.4 dm).

### Early Cost Estimates

Starting point for the early long-range financial planning were, naturally, estimates of the total investment costs required for the establishment of the Observatory, accompanied by predictions of the ultimate running costs. In article I, I quoted the figures mentioned at the June 21, 1953 meeting of the ESO Committee: capital investments of \$ 2.5 million (DM 10.5 million) and annual running costs of \$ 100.000 (DM 420.000), as well as the revised figures of January 1954: \$ 3.5 million (DM 14.7 million) for capital investments and \$ 126.000 (DM 530.000) for running costs. In subsequent years the estimates of the capital investments increased and reached a value of \$ 5 million (DM 21 million, dm 56 million) around the years 1957 to 1960, a figure we encountered already in connection with the grant of one million dollars from the Ford Foundation described in



**Camp Pelicano, April 1972**

*In the context of the restructuring of ESO in Chile, part of the logistic services that had developed at Camp Pelicano from the earliest construction stages on La Silla, were moved to La Silla, but the Camp continued to be the entrance gate to the Observatory. A comparison with the photograph taken in Januar 1966, shown on page 29 of the Messenger No. 58 (article V), shows the development over six years. On the nearest side we recognize the two large storage buildings.*

*Photograph in EHPA.*

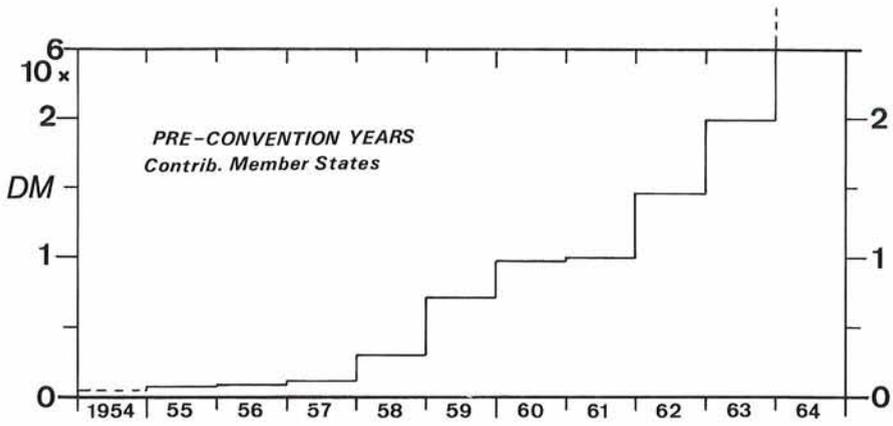


Figure A: The total of the annual financial contributions of the prospective member states over the period from conception of ESO till the ratifications in 1964. The principal expenses to be defrayed from these contributions were the site testing expeditions in South Africa and the connected observational programmes with the Marseilles GPO and the Tübingen photometric telescope.

article I, and at that moment equivalent to the average share of one of the five potential member states. This estimate of \$ 5 million figured prominently in negotiations with government agencies in the years of struggling for getting the Convention signed; in fact so promi-

nently that years later, when it had been amply exceeded, certain government delegates could take naughty pleasure in bringing it back to astronomers' recollection . . .

The \$ 5 million estimate was based on the following components:

an up-to-date estimate of the costs of the Lick 120-inch telescope . . . . .	\$ 3.500.00
an up-to-date estimate of the costs of a copy of the Palomar Schmidt . . . . .	600.000
meridian circle and auxiliary instruments . . . . .	100.000
workshops, buildings, houses . . . . .	100.000
roads, power, water . . . . .	100.000
unspecified . . . . .	600.000
	<u>\$ 5.000.000</u>

and on erection of the Observatory in South Africa. It figured, for instance, in the discussions in the EC meetings of April 1957 [34] and October 1958 [35]. It was estimated that the payments would be spread over 5 years once constructions could be started.

### The Post-Convention Years

This time schedule of five years probably was still more or less what Heckmann had in mind when in his First Annual Report after ratification of the Convention, over the year 1964, he esti-

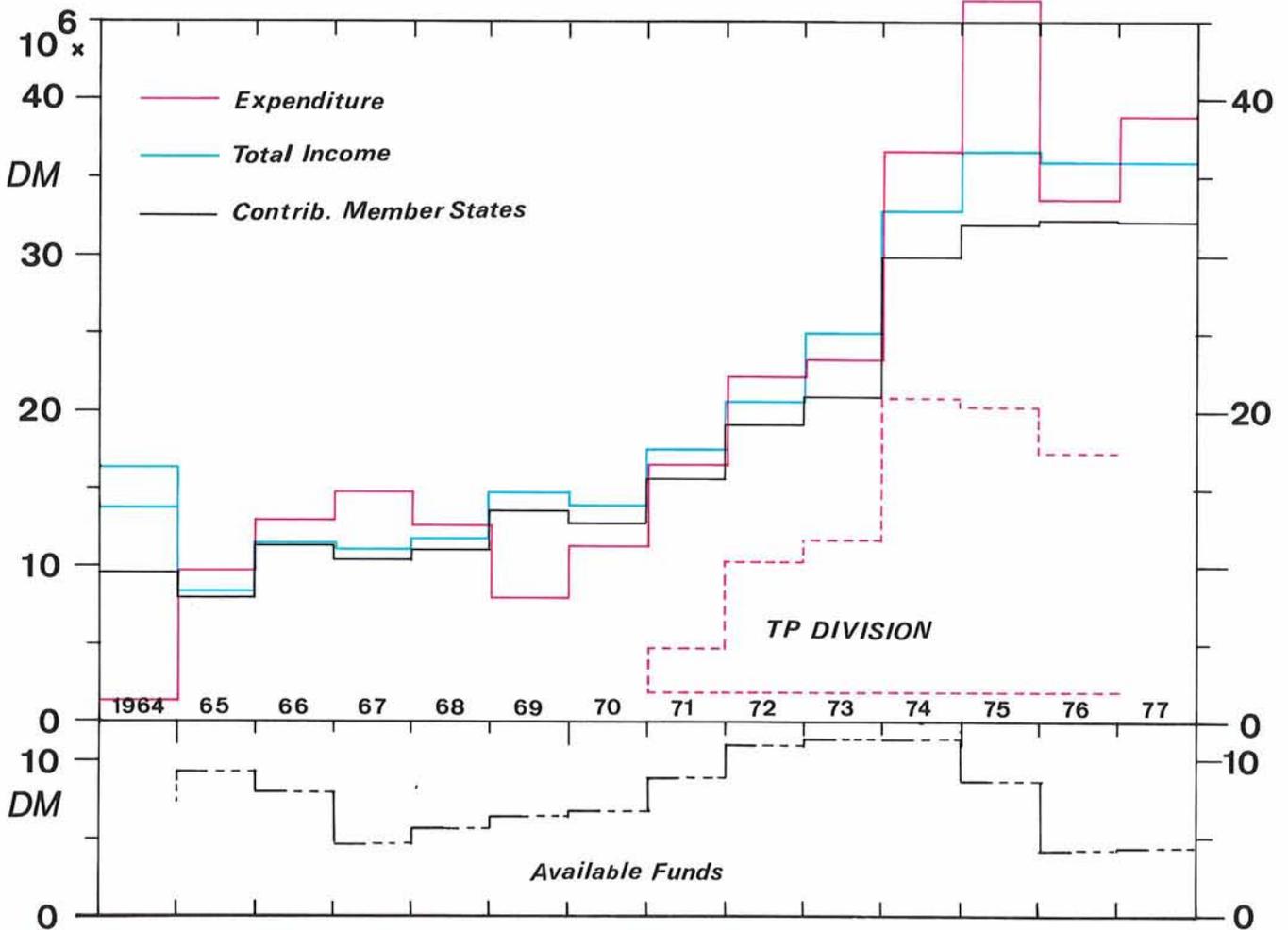


Figure B, top part: Black line: The annual contribution of the member states over the first 14 years following the ratifications. Blue line: The annual contributions increased with additional sources of income including interest from unspent balances ("Available Funds"). Red line: Expenditures; The dashed part represents the share of the TP Division in the years 1971 and later. Bottom part: Development of Available Funds (expressed in Million DM).

mated that up to the end of 1970 the total capital investment would amount to about \$ 12.824.000 to which part of \$ 2.166.000 for Overhead expenses would have to be added, hence about \$ 14 million altogether i.e. dm 132 million. At that time, plans for the major instrumentation had changed radically; not a copy of the Lick telescope but the more powerful and considerably modified 3.6-m Telescope was planned, and also the Schmidt design had been modified. Of course, the principal component of the budget was the 3.6-m Telescope. Its costs, including building and dome was in 1962 estimated to be \$ 7.400.000 but a revised figure at the November, 1966 meeting of the FC became about \$ 1.2 million higher (mostly due to inflation), hence about \$ 8.6 million [36], i.e. 76 million dm.

Finally, at the end of the 1960's, an estimate of the total cost of the 3.6-m Telescope Project was contained in the report Cou-59 referred to in article IX. It was compiled by the Technical Director J. Ramberg in preparation for the December 1969 Council meeting at the time when the new course for the realization of the telescope was under consideration. A breakdown into the main components of Ramberg's estimate follows:

For the Telescope: further design and development . . . . .	\$ 1.000.000
the optics . . . . .	1.715.000
the mechanical parts . . . . .	1.450.000
electric and electronic components . . . . .	1.100.000
aluminizing plant . . . . .	210.000
freight and assembling . . . . .	750.000
For the building . . . . .	2.500.000
For the dome . . . . .	1.200.000
	<u>\$ 9.925.000</u>

corresponding to DM 39 million or dm 82 million.

In comparison to the pre-Convention estimates, another radical change resulted from the switch from South Africa to Chile, where construction costs, including those connected with water supply, power installations, and road constructions would have to be much higher than had been foreseen for South Africa.

### The Annual Contributions from 1964

In Figure B, the black line shows the joint annual contributions starting from 1964, the year in which the Convention was ratified. They are in DM, not yet adjusted for inflation. The blue line shows the annual contributions increased by additional sources of income, such as interest gained over unspent funds and increases or losses re-

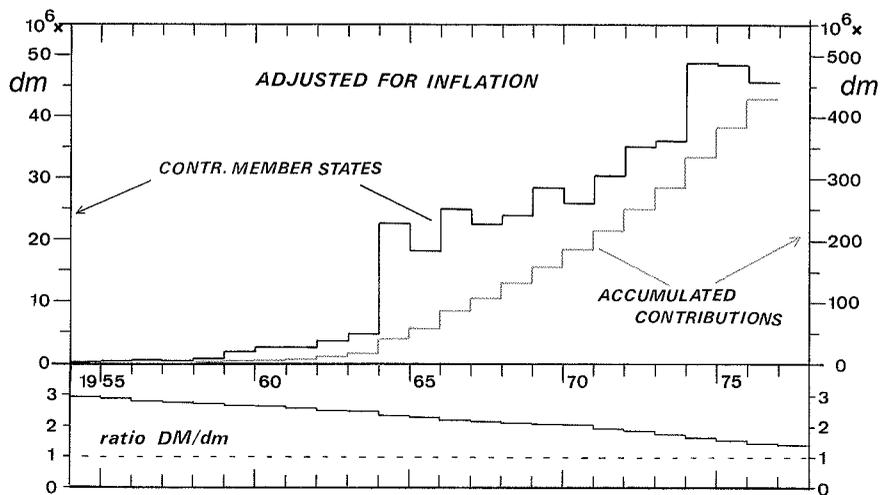


Figure C: Top part. The black line shows the annual contribution of the member states over the first two decades since 1954, adjusted for inflation (i.e. expressed in the purchasing power of the Deutschmark of 1990). The blue line shows the accumulated contribution, i.e. the total of the contributions up to and including the year indicated at the bottom of the figure, and also adjusted for inflation; this line has been derived from the black one. Bottom part. This line shows the gradual change of the ratio between the purchasing power of the Deutschmark at the year indicated, and that in 1990. These ratios were used for obtaining the top part of the figure.

sulting from parity changes between the various currencies in which ESO held its bank accounts, and also the entrance fee of Denmark (spread over the years 1967, 1968 and 1970). The red line shows the expenditures. Unlike the principle I adopted for the earlier articles, to describe only developments reaching into the early 1970's, in the present context we follow developments into the late 1970's.

### Conflicting Interests and the Banner Procedure

We note, in Figure B, the smooth gradual increase of the contributions up to around 1975, in contrast to the stronger fluctuations in the curve of the expenditures. Such strong fluctuations are typical for a project in its construction phase (in this case the work of the TP Division), but they entail conflicting interests. On the one hand, that of the project management that wishes to realize it expediently and therefore needs to dispose of a considerable sum over a limited period. On the other hand, that of the funding agencies, in this case the governments of the member states, who dislike strong fluctuations in their budgets. Moreover, it is customary for government budgeting to avoid commitments beyond the next budget year although, of course, there must be room for long-term projects.

In order to avoid the undesirable shock effect that steep rises in the ESO budget might have, a system was adopted around the year 1970, introduced earlier at CERN and known by

the name of its initiator: the [J. H.] Bannier procedure. It requested the organization not only to submit its budget proposal for the coming year, but also to deposit at the funding ministries a well-founded estimate for the year following and an approximate one for the third year. The system has helped paving the way for the rapid growth of the ESO budget in the early 1970's.

### First Post-Convention Years, 1964–1969

Soon after the Convention had been signed the construction programme in Chile, described in articles V and VI, began to absorb considerable financial means. Accordingly, the annual contributions had to increase, but part of the expenses could be defrayed from the reserves that had been accumulated before 1965. By the time of the completion of the first phase, marked by the dedications on La Silla in March 1969, expenditures went down. This had not been foreseen originally, for at that time it should have been the turn for construction costs of the 3.6-m Telescope and the Schmidt, however, as we have seen in articles VII and IX, these were delayed. This explains the dip in the expenses for the years 1969 and 1970.

Yet, in that period the annual contributions continued to grow. This was partly due to late realization that progress in the telescope constructions would be below expectation, but it also reflected the expectation that soon considerable expenses for these projects would be due anyhow. Thus, reserves

were built up again around the year 1970 that came useful at later dates. The bottom part of Figure B shows how these reserves (called Available Funds in the external auditors' reports) developed in the course of time. Naturally, it was tempting for the financing authorities to use these reserves for reducing next years' contributions. Moreover, for an organization like ESO to put considerable funds on a profitable savings account meets little sympathy on the side of the funding agencies. Luckily, ESO Council and Finance Committee were tolerant in this matter.

### The Years 1971–76; The TP Division

The early 1970's saw the creation of the TP Division for the realization of the 3.6-m Telescope, and one of its first tasks was reliable budget planning. As a consequence, the required annual contributions rose steeply to a level that in the years 1974 and 1975 amounted to more than twice that around the year 1970. The documentation mentioned before allows singling out the financing of the TP Division from the remaining expenses. This leads to the presentation in Figure B. The dashed red contours outline the share of the Division and illustrate that it was responsible for the rapid increase of income and expenses in the early 1970's. Roughly speaking, TP Division expenses through 1976 concerned the 3.6-m Telescope with its building and dome, whereas in subsequent years emphasis shifted to auxiliary instrumentation as part of the regular running costs, and hence annual contributions and expenses then levelled off. Over the period 1971 to 1976 (the year of completion of the 3.6-m Telescope), the integrated expenditure of the TP Division amounted to DM 74 million. We saw that Ramberg's estimate of the year 1969 amounted to DM 39 million; adjusting this to 1975 for inflation would give about DM 52 million.

### Overall Developments Since 1954

In Figure C the black line shows the overall development of the annual contributions over the first two decades from 1954, and this time all figures are in dm, i.e. adjusted to the 1990 purchasing power of the Deutschmark; the amounts are marked along the left-hand scale. We see that after 1964 there was a decade of approximately linear increase of the contributions followed by an extra growth around the completion of the large telescope, and subsequently levelling off when ESO's full operational stage had been reached.

The blue line shows the accumulated

contributions, also in dm, and to be read along the right-hand scale. We infer that by the time the 3.6-m Telescope became operational, ESO had spent altogether about 400 million dm. Of these, the expenditure by the TP Division had been about 113 million dm, i.e. about 28%. A somewhat larger amount, about 150 million dm, 38%, had been spent up to 1970 when ESO's first phase had been concluded with the dedications on La Silla. 34%, or about one third, had been spent after 1969 on the operations and new construction programmes in Chile and on the services (including that for the Visiting Astronomers) at the (provisional) Headquarters in Hamburg-Bergedorf.

### References and Notes

Abbreviations used:

EHA = ESO Historical Archives.

FHA = Files Head of Administration at ESO.

EHPA = ESO Historical Photographs Archives.

- [1] FHA Doc. Cou-62, Minutes 14th Cou Meeting, p.16.
- [2] See Ref. [1], p.10.
- [3] FHA Doc. Cou-96, Minutes 17th Cou Meeting, p.31.
- [4] See, for instance, the minutes of Cou and FC over the years 1971–1973.
- [5] This proposal served for discussion in closed session at the 2nd meeting of the SPC and is not in the FHA. Its contents is reported in the minutes of this meeting, Doc. SPC-2 in FHA.
- [6] See, for instance, the compilation "Publications based on observational work at the ESO Observatory La Silla", of Nov. 1974, Doc. OPC-20 in FHA-Sc.Act.
- [7] Minutes of this meeting with attached report of Chairman SPC to C. of Cou., Doc. Cou-121rev. in FHA.
- [8] See Doc. Cou-126 of Oct. 20, 1972 in FHA.

- [9] FHA Doc. Cou-127, Minutes of C. of Cou.
- [10] FHA Doc. Cou-126rev.
- [11] FHA Doc. Cou-131, Summary 20th meeting of Council; see also discussion of this topic in minutes 21st Cou meeting, Doc. Cou-149.
- [12] Report Chairman SPC and Minutes C. of Cou., Docs. Cou-145 and Cou-136 in FHA.
- [13] FHA Doc. Cou-142.
- [14] FHA Doc. Cou-149, Minutes 21st Cou. meeting.
- [15] See Ref. [9].
- [16] FHA Doc. Cou-147, Minutes 8th meeting C. of Cou., p.9.
- [17] FHA Doc. Cou-150, p.7.
- [18] FHA Doc. Cou-162, Minutes 22nd Cou. meeting, p. 21–23.
- [19] FHA Doc. Cou-175, Minutes 23rd Cou. meeting.
- [20] Proceedings of the ESO/SRC/CERN Conference on Research Programmes for the New Large Telescopes, Ed., A. Reiz, 1974.
- [21] FHA Doc. Cou-179, Minutes 12th meeting C. of Cou., p.2
- [22] FHA Doc. FC-246 and Cou-115.
- [23] FHA Doc. Cou-119, Minutes 19th Cou. meeting, p.11.
- [24] FHA Docs Cou-131 and Cou-135, Summary of Conclusions and Minutes 20th Cou. meeting.
- [25] FHA Doc. Cou-142 and discussion by president SPC in C. of Cou. in May 1973, see Doc. Cou-147.
- [26] FHA Doc. Cou-150, p.8.
- [27] FHA Doc. Cou-162.
- [28] FHA Doc. Cou-175.
- [29] EHA-I.B.8.
- [30] Monatsberichte Deutsche Bundesbank, Statistische Beihefte, Mai 1989, No. 2.
- [31] Statistisches Bundesamt, Fachserie 17, Reihe 7, Preise und Preisindizes . . . (November 1990).
- [32] Minutes 2nd meeting Provisional Finance Comm. in FHA.
- [33] Docs FC-44,45 in FHA.
- [34] EHA-I.A.1.5. and I.B.3.
- [35] EHA-I.A.2.17. and I.B.7.
- [36] Minutes of the 9th meeting of F.C., Doc. FC-102 in FHA.

## Visiting Professor in Astronomy – 1991/92

Under the recent Portugal-ESO Agreement, there is the possibility of financing a lecturership at the University of Porto.

**Host Institution:** Centro de Astrofísica – Universidade do Porto

**Field:** Astronomy/Astrophysics

**Period:** 6 to 8 weeks, starting from the middle of October 1991 or beginning of May 1992.

**Titles of the courses to be taught:** Extragalactic Astronomy, Galactic Astronomy, Interstellar Medium, Stellar Astronomy; other possibilities may be acceptable.

**Qualifications:** Ph.D., preferably with some teaching experience in Astronomy/Astrophysics. Preference will be given to people with interest in observational Astronomy, in particular with experience of using the ESO facilities.

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