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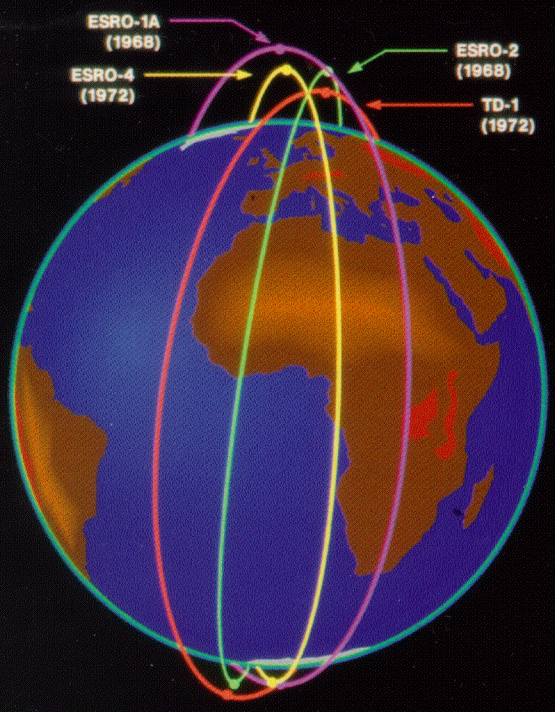
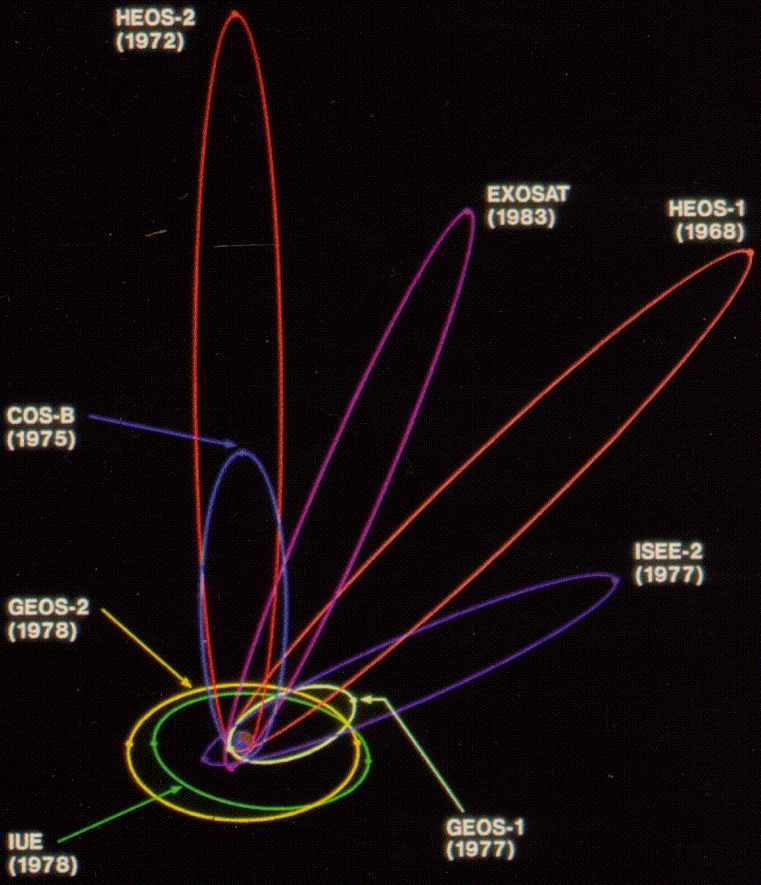
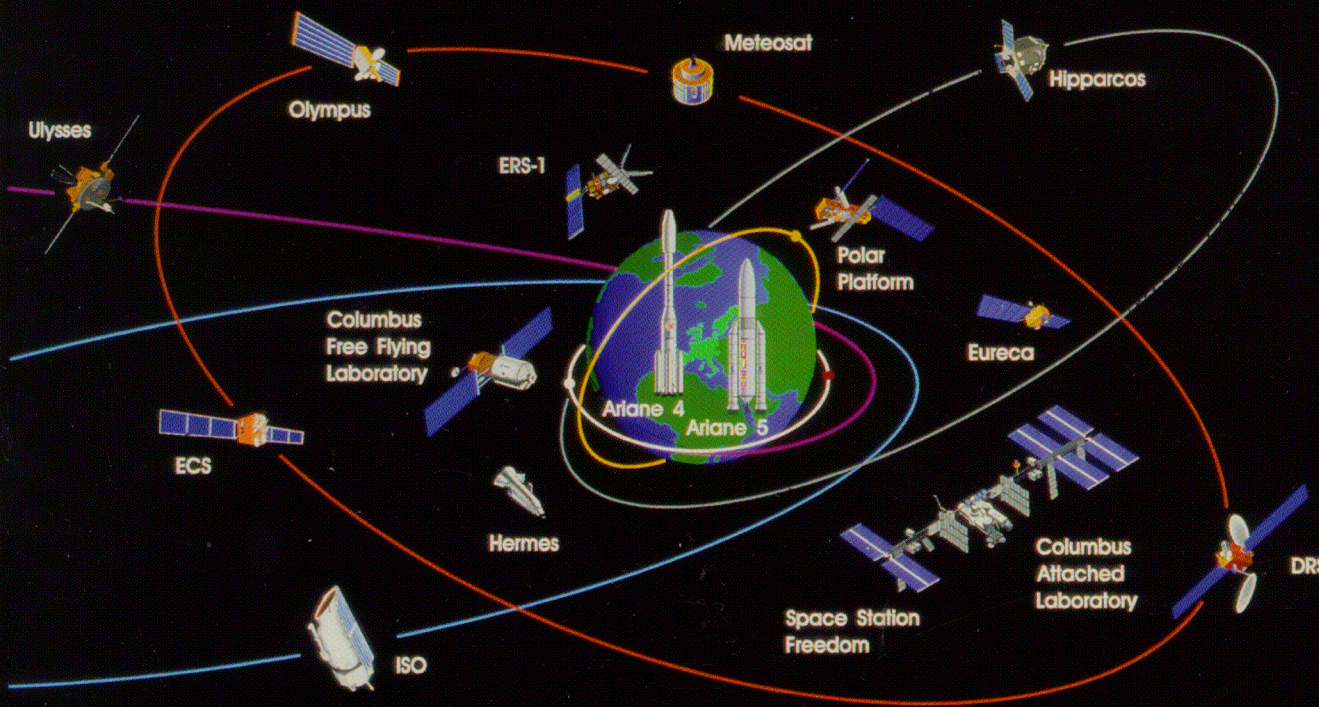


The Prehistory of ESRO 1959/60

by John Krige





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The ESA History Study Reports are preliminary reports of studies carried out within the framework of an ESA contract. As such they will form the basis of a comprehensive study of European Space activities covering the period 1959-87. The authors would welcome comments and criticism which should be sent to them at the appropriate address below.

The opinions and comments expressed and the conclusions reached are those of the authors, and do not necessarily reflect the policy of the Agency.

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The project is based at the European University Institute, where the ESA archives are also housed. John Krige is the Project Leader.

The Prehistory of ESRO
1959/60
From the First Initiatives
to the Formation of the COPERS[1]

John Krige

Table of contents

The origins of a joint European space effort are generally traced back to a number of initiatives taken in 1959 and 1960 by a small group of scientists and science administrators, catalysed by two friends, physicists and scientific statesmen, Edoardo Amaldi and Pierre Auger. Neither Amaldi nor Auger was a stranger to the cause of scientific collaboration on a European scale. Indeed it was they who, in the early 1950s, were key actors in the process which led to the setting up of CERN, the European Organisation for Nuclear Research. Now, as the decade drew to a close, they turned their attention to space. Success was rapid. Within a year of the first formal discussions being held amongst scientists European governments had set up a preparatory commission to explore the possibilities for a joint space research effort.

The most striking feature of the story we are about to tell is the transformation of the scientist's original project into one which was more modest in scope — and over which they could hope to retain a large measure of control. In the first meetings held in the early 1960s they were thinking of setting up a European body dedicated solely to scientific research, but with sufficient funds to finance all that that required,

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[1] This account is based primarily on a collection of documents deposited by Jean Mussard in the ESA Archives, Villa Il Poggiolo, European University Institute, Florence. Mussard was Pierre Auger's right-hand man in the formative years of CERN and of ESRO. We have also used papers from a small collection donated by Auger himself, and official papers from the files deposited by ESA. A master set of these has been established, and we do not need to refer to them by box number.

Some use has also been made of material in Foreign Office files in the (UK) Public Record Office, London, hereafter abbreviated PRO—FO and in the French Archives Nationales in Paris.

from the joint development of a launcher to the construction of satellites and of (some of) the scientific instrumentation needed for research. In parallel with these discussions, however, governments and industry were formulating their own ideas about the nature and purposes of a European collaborative venture. At the heart of their deliberations was the question of the launcher. For the scientists a launcher was essentially a means to put a scientific experiment into orbit. For politicians and industrialists it was a device whose development was intertwined with national and European political, military and commercial strategy. Starting from very different perspectives, and seeking control over very different aspects of the space programme, by the end of 1960 it was understood by both parties that Europe would probably have not one, but two space organizations, one dedicated to scientific research the other to launcher development. It was an arrangement that at the time pleased scientists and politicians in at least the prime movers, Britain and France. But it was an arrangement that was to cause endless difficulty for Europe throughout the sixties.

1 1959. The first steps

The first formal contact between Auger and Amaldi seems to have been a letter from the Rome physicist dated 6 February 1959.[2] About two months later, sometime in April, the two friends met in Paris, and during a peripatetic conversation in the Luxembourg Gardens they discussed the creation of a European organisation for space research.[3] Shortly after this conversation Amaldi drafted an important document entitled *Space Research in Europe* and dated 30 April 1959.[4]

Amaldi began by describing the international initiatives which had been taken in the past few years to encourage scientific research in space using rockets and satellites. This had really got under way during the International Geophysical Year (IGY), which ran from 1 July 1957 to 31 December 1958. In anticipation of the ending of the IGY, Amaldi explained, the International Council of Scientific Unions had set up a number of additional committees to ensure that the scientific work which had been initiated during the preceding 18 months was continued on an international

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[2] We have not found this letter. It is, however, referred to in a detailed chronology headed *Commission Preparatoire Européenne de Recherches Spatiales. Dates des Reunions Depuis l'Origine*, which can be found in the Auger papers (cf. note 1).

[3] There is a reference made to this in a document entitled *Sur la création d'ESRO* in the Auger papers (cf. note 1). This paper is undated but it was probably written in the late 1960s or early 1970s. See also Auger (1984).

[4] The paper is in the folder *Origines de la COPERS I* (Mussard files, cf. note 1).

basis. One of these was the Committee on Space Research (COSPAR) which had the task of coordinating and promoting the development of space research on behalf of the world scientific community.[5]

Having sketched the international structures put in place in the second half of the 1950s, Amaldi went on to identify some of the important results which had already been obtained. The most significant of these was the so-called Van Allen "radiation" belts. These belts comprised charged electrons and protons with an energy between a fraction and several dozen MeV. The particles were effectively trapped by the earth's magnetic field, and seldom if ever penetrated into the atmosphere. They were first detected by a Geiger-Müller counter mounted on *Explorer-1*, the first American satellite launched on 31 January 1958. This discovery, wrote Amaldi, was one of several of "exceptional importance, in that they open up a whole new field of hitherto unexplored and vast phenomena involving the properties of the earth, the sun, and cosmic radiation." They were, he went on to say, "no more than a modest beginning in a field of research so enormous and important that it far surpasses anything that can be imagined today."

The scientific importance of the field having been identified, Amaldi went on to stress how urgent it was for Europe to enter it. To date, he pointed out, only the Soviet Union and the United States of America were in a position to capitalise on the new possibilities being opened up by research into space using rockets and satellites. This gap could only become wider if not "all but unbridgeable" if measures were not taken immediately to close it "both on the scientific and on the technological and industrial plane [...]". Elaborating on the latter point Amaldi stressed that the launching of satellites required the development of a large number of fields of industrial significance, like propellants, metallurgy, and electronics "and this development in turn has its effect on the countries' entire industry", he went on to say.

What chance did Europe have of closing the gap, though? Countries having lesser financial, industrial and organisational capacities than the two superpowers, he said, would find it very difficult to establish themselves in this field. There was a danger then that this type of research was "destined to remain a monopoly of the United States and the Soviet Union", with the countries of Europe being "mere

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[5] General information on these international organisations was provided by Amaldi in four extensive appendices attached to his document. The President of COSPAR's first Executive Committee was Professor H.C. van de Hulst, of Leiden in the Netherlands, and Professor H.S.W. Massey from London was one of its members. We shall meet them again soon.

spectators of the grand endeavours to the East and West of our continent." There was a solution, however. "An International Organisation pooling the resources of, say, ten European countries might well be able to tackle the problem", wrote Amaldi, "and to enable the scientists of Europe to make a valuable contribution to the exploration and study of outer space." This organisation, he went on to say, "could achieve impressive results within four or five years" if it had a budget about twice as large as that of CERN, currently costing about 65 million Swiss francs per year. Money, however, was not enough. "The proposed European Space Research Organisation should have no other purpose than research and should, therefore, be independent of any kind of military organisation and free from any Official Secrets Act." This was not only necessary to ensure what Amaldi called "its moral authority." It was probably also crucial, he pointed out, to ensure the participation of a wide cross-section of European states.

Amaldi then turned to discussing the possible programme of the new organisation. While stressing that it would have to be "very closely defined", he was careful to avoid being too precise about its contents. He limited himself to suggesting that it concern itself with two problems phased in time. One "might be a standard problem of the kind already solved by the U.S.S.R. and U.S.A., so chosen that its solution could be expected within a relatively short time of, say, three to four years." The second problem would be much more ambitious and comparable to "the greatest enterprises" then being undertaken in the United States and the Soviet Union. This might last for six to seven years. The first problem would serve to give Europeans the time and the opportunity to develop the know-how and to train the personnel required for space research. The second would put them on a level comparable to that attained by the leading protagonists in the field.

Finally, addressing himself to procedural matters Amaldi proposed that a number of European countries — and here he identified Belgium, France, Germany, Italy and the Netherlands — could set up commissions to assess the resources available nationally, and to estimate the total effort required to make a meaningful contribution to space research. Their findings could then be laid before an international conference which would work out a detailed programme for submission to the governments of interested countries. Amaldi concluded by saying that this preparatory stage should not exceed one year. If a European organisation "or at least a fairly well-founded provisional precursor of it" could begin operating before the end of 1960 Europe could hope to close the gap between "herself and the Soviet Union and the United States before 1970."

The list of countries cited by Amaldi was anything but arbitrary. Indeed, his paper was circulated to senior science administrators in each of the five that he had mentioned — to P. Auger, in his capacity as the president of the Comité des Recherches Spatiales in France, to J.H. Bannier, the director of the Netherlands Organisation for the Advancement of Pure Research (ZWO), to F. Giordani, the president of the Italian Consiglio Nazionale delle Ricerche, to A. Hocker, at the German Bundesministerium für Atomfragen and, finally, to J. Willems, the president of the Belgian Institut Inter-Universitaire de Sciences Nucléaires. The paper was also sent to CERN's Director-General, C.J. Bakker and to the President of the EURATOM Commission, E. Hirsch, to encourage other European institutions to take an interest in the initiative.[6]

We have no direct information on how the recipients of Amaldi's report reacted to its contents. Suffice it to say that a French version of the text, without its appendices, was published under the more explicit title *Créons une organisation européenne pour la recherche spatiale* in December 1959. This version differed only slightly from that circulated in May. But it was supplemented by extremely positive reactions from a number of high-level academics and administrators in Belgium, France, Germany and the Netherlands, and an additional statement by Amaldi.[7]

In his statement Amaldi stressed again that the new organisation should be kept out of the hands of the military, and devoted to strictly scientific and peaceful activities. It should have a central laboratory, its own launching range, and it should develop a European launcher. "If the military maintained a monopoly on the construction of rockets", he said, "each European country would build its own". "We must take CERN as a model", Amaldi stressed, estimating that one could do a "good job" with three to four times CERN's annual budget. Time though was of the essence. A small group of five or six people from interested European countries should to be set up "as soon as possible" to study together a more detailed scheme. Within a matter of weeks Auger had taken the first steps in this direction.

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6 This information from a *First Mailing List — May 1959* (folder *Origines de la COPERS I*, Mussard files (cf. note 1)). We shall say a little more about the significance of some of these personalities in due course.

7 Amaldi (1959) and, for an English version of the text, Amaldi (1984).

These early initiatives call for two comments of a very different kind. Firstly, there is Amaldi's determination that the entire European space effort, from the development of launchers to the construction, launching and operation of satellites, be under civilian control and, more specifically, be essentially in the hands of the scientific community. Secondly, there is the precise role played by Amaldi and Auger in launching a European space effort, the sense in which they may be characterized as its "founding fathers".

Amaldi's insistence that a collaborative European space effort be civilian in character was partly a matter of temperament: he made a point throughout the postwar period of publicly distancing himself from the direct military applications of science, even setting down his day-to-day movements in a diary intended to "prove" that he had not been personally involved in such activities. His attitude was also that of a generation of physicists who had seen, and disliked, the restrictions placed on scientific research and on scientists by the military during wartime projects. Finally, it was indicative of the pragmatically inspired belief that only if the new body were solely dedicated to peaceful purposes could it be fully European in the sense that it could include all the member states of CERN, notably the "neutrals" like Sweden and Switzerland.

Two considerations lay behind these sentiments and gave an added significance to Amaldi's demand for a civilian space programme. Firstly, there was the strategic nature of space itself, an activity in which the boundaries between basic research and commercial applications, and between peaceful and belligerent uses were quickly blurred. The technology developed for a scientific satellite could be transferred to a telecommunications satellite commissioned by a Postmaster General or by a Brigadier General. The rockets used to launch satellites could also be the intercontinental ballistic missiles used to launch nuclear warheads. Secondly, and most fundamentally, there were important moves being made inside NATO (the North Atlantic Treaty Organization) at the time to shape European collaboration in space. In June 1957 NATO set up a Task Force on Scientific and Technical Cooperation. Its report was rushed directly to a meeting of the NATO heads of government in December that year. The launch of Sputnik a few months earlier weighed heavily on everyone's minds. The meeting affirmed that "the full development of our science and technology is essential to the culture, to the economy and to the political and military strength of the Atlantic community", and established a science committee forthwith.[8] Within months it had suggested that NATO organize

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[8] For this, and other information on the NATO science committee, see NATO (1973). The

a space research programme. In the face of considerable opposition from scientists the committee's second chairman and science adviser to the NATO Secretary General, F. Seitz, who held office in 1959-60, suggested that NATO sponsor a European NASA to work with the American NASA.[9] It was against the backcloth of these developments that Amaldi contacted Auger in February and again in April 1959. Indeed the moves being taken inside NATO at this time might well have been the most important single consideration which spurred Amaldi to act when he did. Certainly the NATO science committee was quick to learn that the eminent Italian scientist was against any military involvement in a joint European space effort. Remember that his April 1959 paper was sent *inter alia* to Prof. F. Giordani. Giordani was the president of the Italian Consiglio Nazionale delle Ricerche. He was also a founder member of the NATO Science Committee, on which he served from 1958 to 1961.

It was not only a civilian space organization that Amaldi sought however: it was also one in which scientists had the power to shape the programme free not simply from military pressures but from bureaucratic and political "interference" by member states' governments. Here lies the significance of his claim that any new body be "modelled on CERN". At one level this simply meant that CERN provide practical guidelines for the new organization, a precedent and a point of reference for its membership — assumed to be the ten core member states of CERN —[10], its annual budget — always specified in relation to CERN's —, and its initial programme — defined as involving two phases, the first conventional (corresponding to the construction of the CERN synchrocyclotron), the second state-of-the-art (like the CERN proton synchrotron).[11] More fundamentally though Amaldi wanted the new institution modelled on the CERN in the sense that it was to be "depoliticised". On the one hand this meant that governments should pay for the programme without trying to define its direction and content — whence Auger's remark, after considering the possibility of "modelling" the space research organization on EURATOM, "that this was not an example to follow, since it was too subject to political

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quotation at the end of the previous sentence is from p. 15.

9 For these NATO initiatives in space research see Massey and Robins (1986), 108-9.

10 The first twelve member states of CERN were Belgium, Denmark, Federal Republic of Germany, France, Greece, Italy, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom and Yugoslavia. In reducing these numbers to ten Amaldi undoubtedly eliminated Greece and Yugoslavia, the former presumably for predominantly financial reasons, the latter because of the changed international climate in 1960 as opposed to 1950.

11 For the launching of CERN see Hermann, Krige, Mersits and Pestre (1987).

contingencies".[12] On the other it encapsulated the hope that the member states' delegates to the organization would believe in its importance, would leave the scientists and engineers who ran it to get on with the job with a minimum of external surveillance, and would be prepared vigorously to defend its interests before their national authorities — whence the circulation of Amaldi's May report to Bannier, Hocker and Willems, three of the staunchest members of the CERN "lobby", administrators who shared Amaldi's goals, administrators who saw themselves not simply as representing their national governments at CERN but also as representing CERN before their national governments.[13]

The second comment we want to make about this early initiative concerns the precise role of Amaldi and of Auger. These two were not the first to propose some sort of European collaboration in the general area of space. Indeed as early as November/December 1957 a plea was made for the "creation of a *European* centre for rocket research, which would be managed by scientists, on the model of the Centre Européen de Recherche Nucléaire (C.E.R.N.)".[14] NATO was also actively canvassing the idea in 1958/1959 as we have seen. That there should be other suggestions of the kind made by Amaldi and Auger is hardly surprising. Granted the context in which the exploration of space was born in the late 1950s, it was inevitably at once a symbol of scientific and technological prowess, an index of political power, and a component of military strategy. Other governments could not stand by idly and allow the superpowers to monopolise the field. Indeed many countries (Australia, France, Italy, Japan, Switzerland ...) took steps to establish national space committees

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[12] When Auger and Amaldi first discussed their ideas in the Luxembourg Gardens in April, it seems as though they may have been torn between modelling a space research organisation on EURATOM or on CERN. Indeed it is possible that on this occasion Amaldi proposed the name EUROLUNE for the organisation to be created, "a daughter of the European Communities, like EURATOM" — see paper by Auger entitled *Sur la création d'ESRO*, undated but clearly later 1960s, early 1970s (Auger Papers, cf. note 1), from which the quotations are taken.

Amaldi's son Ugo clearly remembers his father announcing excitedly at dinner one evening that he had thought of the name EUROLUNE for the new space organization, expressing a hope that the joint venture would lead to the exploration of the moon (private communication with J. Krige).

[13] For the concept of the CERN "lobby" see Pestre in Hermann, Krige, Mersits and Pestre (1990), chapter 7. The last phrase in this paragraph is a paraphrase of a statement made by Bannier at a CERN meeting in 1957 in which he rapped the British delegate over the knuckles for what he felt was that country's lack of commitment to CERN.

[14] This plea was made in an unsigned article — in fact the author was J. Blamont — entitled "Les nations et la conquête de l'espace' which appeared in *Les cahiers de la République*, novembre-décembre 1957, No. 10, pp. 8-19. The aim of *Les cahiers...*, as described in a note written by Mèndes France in the first number issued in 1956, was to prepare the ground intellectually for action at the political level.

in the late 1950s. Amaldi and Auger brought two specific elements to this rapidly evolving situation.

Firstly, they were plugged into the appropriate national and international networks, appropriate in the sense that they knew personally the high-level science administrators whom they could count on to sympathise with their ideas and to do something about having them implemented. Throughout the 1950s Amaldi had enriched and extended his links into the CERN network through his ongoing activities in the Geneva laboratory.[15] By the end of the decade he was also a member of the newly-formed EURATOM's Scientific and Technical Committee. As for Auger, through his presence in UNESCO he had played a key role both in the birth of CERN and in setting up an international computing centre in Rome in the mid-1950s. Now he was the chairman of the French national space committee established in January 1959, through which he had direct access to the French Minister of Foreign Affairs, for example.

Alongside their network of personal relationships — and this was their second trump card — there was Amaldi's and Auger's sense of timing. Indeed the Rome physicist's article calling for the creation of a European space research organisation, with its supporting statements, was published the month after a major achievement at CERN and the month before a major COSPAR meeting. In November 1959 CERN's proton synchrotron reached its design energy of 25 GeV for the first time. European physicists had the most powerful high-energy accelerator in the world at their disposal. European governments, by pooling their resources, seemed, at a stroke, to have made up the gap that separated them from the United States. By the end of 1959 then it was clear that European scientific and technical cooperation could work, and it was almost natural to consider extending it to the new and challenging field of space. And what better place to broaden support for such a project than the meeting of COSPAR to be held in Nice in January 1960. "It is the first time that such a conference has been held", wrote Auger, "and it will play for space a role analogous to that which the 1955 Geneva conference played for the atom".[16] It was clearly an opportunity too good to miss. Indeed, the ground had already been prepared. The journal in which the French version of Amaldi's report had been published in December 1959 had asked van de Hulst, the president of COSPAR's executive

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[15] Between 1958 and 1960 he was the chairman of the Scientific Policy Committee, and between 1961 and 1963 he was a vice-president, with Bannier, of the Council whose president was in fact Willems.

[16] Document *Note sur la recherche spatiale en France*, 11-15/1/1960 (Auger Papers, cf. note 1).

committee for his comments on the piece. They quoted him as saying that "we will offer our services to a European organism."[17] Sandwiched between CERN's achievement and COSPAR's conference, the publication of the plea for a joint European space effort could not but make an impact.

2 *January to April 1960. Building support in the scientific community*

The first General Assembly of COSPAR was held at the Centre Universitaire Méditerranée in Nice from 9 to 16 January 1960. It was here that Auger discussed with a number of European scientists the possibility "of creating a European space institute, quoting CERN as an example of success."[18] All that we know about these discussions is that they were held with scientists from a wide variety of Western European countries: Auger speaks of one meeting at which five countries were represented and another at which scientists of eight different nationalities were present.[19] Encouraged by the reaction of his colleagues Auger suggested that they meet again to discuss the matter in greater depth at his home in Paris.

This informal meeting, allegedly "set up with great secrecy", duly took place on 29 February 1960.[20] It was attended by eight scientists from eight different countries, most or all of whom had important administrative roles. In addition to Amaldi and Auger were present:

- J. Bartels, from the Geophysikalisches Institut, Gottingen, Germany;
- E.Å. Brunberg, from the Royal Institute of Technology, Stockholm, Sweden, and secretary of the newly established Swedish committee on space research;
- E.J. Houtermans, from the University of Bern, Switzerland, then involved in the formation of a Swiss committee on space research;
- H.S.W. Massey, from University College London, the chairman of the British National Committee for Space Research;
- M. Nicolet, from the Centre National de Recherches de l'Espace in Brussels, Belgium, of which he was the first director;

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17 Van de Hulst's offer was published along with the main text of Amaldi (1959).

18 From document entitled *Genèse de l'Europe spatiale* (M. Nicolet, private communication with J. Krige). Auger has written that it was at this meeting "that the first clear idea of a European Space Research Organisation was born" — Auger (1984).

19 See Auger (1984), and his chronology cited in note 2.

20 For the quotation see Massey and Robins (1986), 110. See also Auger (1984).

- J. Veldkamp, from the Royal Dutch Meteorological Institute in De Bilt, Netherlands, who was the secretary of the Netherlands Committee of Geophysical and Space Research.

A ninth scientist, S. Rosseland, was invited but could not attend. Rosseland was the chairman of the Norwegian Space Research Committee.[21]

The meeting in Auger's flat was important for two reasons. Firstly, it confirmed that at least all of those present were interested in a joint European space research effort. Secondly, it emerged that the British were most enthusiastic about the scheme. Indeed, Massey apparently went out of his way to "make it clear that British scientists were favourably disposed towards European collaboration". Reading the mood of the gathering, Sir Harrie then "suggested that, as a next step towards formalisation of the discussions, he would ask the British National Committee for Space Research to consider issuing an invitation to a meeting in London, in late April, with aim (sic) of setting up a recognised Committee or working group".[22]

An informal meeting of about 20 European space research scientists from ten West European countries (the founder members of CERN minus Greece and Yugoslavia[23]) met in the rooms of the Royal Society, London on 29 April 1960. Sir William Hodge, the Physical Secretary of the Royal Society was in the chair, in the absence of Massey who was visiting Australia at the time.[24] After scientists from several countries had reported on their national activities, the discussion focussed on three main issues. Firstly, the possibilities for cooperation using existing or soon to be

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[21] For the affiliations of the people in this list, see the minutes of the meeting held at the Royal Society on 29 April 1960 (note 24 below) and Massey and Robins (1986), 110. Rosseland was also a member of the NATO Science Committee from 1958-1965 — see NATO (1973).

[22] Massey and Robins (1986), 110.

[23] See note 10 for a list of the countries represented.

[24] Those present were: L.M. Malet (B), K. Thernøe representing J.K. Bøggild (DK), P. Auger (F), J. Blamont (F), A. Ehmert (FRG), E. Amaldi (I), L. Broglio (I), H.C. van de Hulst (NL), H.S. van der Maas (NL), J. Veldkamp (NL), R. Rosseland (N), E-Å. Brunberg (S), M. Golay (CH), F.G. Houtermans (CH), Sir William Hodge (UK), R.L.F. Boyd (UK), H. Elliot (UK), A.W. Lines (UK), D.C. Martin (UK), J.A. Ratcliffe (UK), M.O. Robins (UK), R.L. Smith-Rose (UK). The minutes of this meeting are headed *Western European Space Research Meeting, 29 April 1960*, Document NCSP/80a (60), dated 30/4/60. They can be found in the folder *Origines de la COPERS I*, Mussard papers (cf. note 1). This folder also contains the agenda and other papers prepared for the meeting, notably national reports from the Netherlands, Norway, Sweden, Switzerland, United Kingdom and West Germany. The draft minutes, Document NCSP/80 (60) are also in this folder. They differ from the final version of the minutes in that they include more information on the French national programme and statements by Auger as to the kind of contribution that France would be likely to make towards a joint European satellite programme.

developed national facilities. Secondly, the possibilities for a jointly funded European initiative in the field of space research. Thirdly, the most desirable procedure to be followed for implementing such an initiative.

Three main areas were identified in which European countries could profitably make use of one another's existing facilities. Visiting scientists could be exchanged between universities and some government funded institutions in different countries. Satellites tracking could be coordinated at a European level, and a joint plan agreed for the best distribution of stations and the most appropriate instrumentation with which to equip them. Finally the importance of cooperating in sounding-rocket experiments was stressed, particularly the advantages to be gained by scientists in one country using launching facilities in another, geographically different region. The Swedes pointed out that there was a site available near the Arctic circle and that the possibility of building a larger site was being discussed. They welcomed proposals for launching "foreign apparatus" from both. Norway was similarly considering a site in the northern coastal region, as well as launchings from ships, and again if these plans matured "European cooperative work there would be welcomed." The Italian military had developed a launching site at Sardinia, and the ministry of defence had agreed "that the facilities of the range could be put at the disposal of university workers." Finally, the French could offer their military base in the Sahara, which was particularly convenient as it was in an uninhabited area of 300 km^2. After some deliberation those present decided that "it was a little too early" to set up a working group to investigate the possibilities offered by these proposals; the matter was better discussed again later.

Attention then focussed on cooperation in artificial satellite experiments. Auger pointed out that this could take place in two ways. There could be simple bilateral cooperation in which countries like Britain or France, which already had plans to launch their own satellites, could include experiments from other countries in the spacecraft. Alternatively, as Auger put it, "all the nations might join together in constructing and launching artificial satellites with each of them contributing to the cost." Attention rapidly focussed on the kind of programme this CERN-like organization could have, the debate being dominated by the British whose plans were obviously well advanced.

The British scientists described the experiments that they might like to perform during the next five years -- galactic noise measurements, the determination of cloud cover, the geodetic uses of flashing satellites, oceanographic studies from

satellites, deeper space probes, etc. The project which they described in most detail, however, was a large satellite carrying an astronomical telescope to be used for obtaining ultraviolet and X-ray stellar spectra. This was to be a high resolution instrument (a figure of 1 Ångström was mentioned) stabilised for astronomical studies. The design study on the satellite had been in progress for six months and British scientists hoped to be able to place design contracts by the end of 1961. In parallel with these developments there was an important civilian launcher programme being considered in Britain. The government, it was pointed out, was possibly going to cease the development of its *Blue Streak* ballistic rocket for military purposes. (The decision to cancel the military rocket programme had in fact been taken by the Cabinet on 13 April, just a fortnight before the Royal Society meeting.) If the UK decided to recycle it for civilian purposes, *Blue Streak* could be used as the first stage of a satellite launcher, with a modified version of the *Black Knight* rocket as the second stage. The British scientists explained that three satellites of various sizes had been considered in relation to the design studies of this possible British civilian launcher, of which the large astronomical satellite was the heaviest.

The details of the British five-year plan were spelled out before lunch. Immediately after lunch, if not before, it was clear that the British were not simply interested in informing their colleagues. They were also trying to gauge the level of interest in the European scientific community for a research programme based on the use of *Blue Streak* as a launcher. According to the minutes the chairman opened the afternoon session by asking "whether any of those present were in a position to give details of their own proposed participation in any joint European satellite programme which might be formulated [...]." He went on to ask for indications of the level of financial support which governments might be willing to contribute towards such a joint programme. Then, becoming even more specific, Hodge inquired "if any country represented would be prepared to indicate the possible order of their contribution should the Blue Streak rocket be used to place a European satellite in orbit." The British programme, it was said, would cost about £20 million a year for each of the first five years. This would be used for *Blue Streak* and for other stages of the launcher as well as for the development of the satellites, aiming at two launchings a year two or three years into the programme.

The British proposal was received very positively, and various delegates made suggestions as to the kind and level of contribution which they could make to a joint European programme. In the draft, but not in the final, version of the minutes Auger suggested that a French contribution of £4-5 million per annum would probably be

favourably considered in official circles. Several delegates — Amaldi (I), Houtermans (CH), Malet (B), van de Hulst (NL) — felt that their countries would probably be willing to make contributions of at least the same magnitude as that which they made to CERN. All who spoke were also keen to see *Blue Streak* used as a civilian launcher, though Amaldi and van de Hulst were quick to stress that they were not interested in the rocket in itself. "The Italian government", said the former, "would certainly look very favourably on the use of part of its contribution for the further development of Blue Streak, provided that Blue Streak really became an important part of a common integrated European project". Similarly van de Hulst was careful to specify that any Dutch contribution was to be used "for the broader aim of placing a European satellite in orbit and not merely for the development of Blue Streak as a launching vehicle." These concerns did not impede the committee agreeing "unanimously that Blue Streak appeared to be the best possible solution to the problem of finding a suitable launching vehicle for a European satellite." And Auger, spelling out a seven-year programme, proposed that "its final climax" "should be the placing in orbit of a heavy accurately stabilised platform."

The only jarring note in what seems to have been an otherwise enthusiastic response to the British proposals, concerned the position of the Commonwealth in any joint programme. In particular there was the question of Australia, which had important launching facilities at Woomera in the north of the country. From the British point of view, the participation of this country was essential for both scientific and political reasons. Many others — notably Amaldi, Auger and van de Hulst — were not keen to include Commonwealth countries on an equal footing in a European programme, suggesting that an informal arrangement similar to that which existed between CERN and its non-member states (like Israel) might be a suitable solution. It was decided to postpone consideration of this thorny issue to a later date pending, one imagines, clarity about the UK government's intentions for *Blue Streak.*

How was the group to proceed? Auger suggested that it should constitute itself there and then as a provisional European Space Research Group. He hoped that this group could have considerable powers, including powers to decide what other member states should be part of a joint venture. This proposal ran into difficulties immediately. A Swedish delegate pointed out that if this was done the constitution of the group should be officially communicated "to the Russians" to protect Sweden's neutrality. The British chairman of the meeting, for his part, said that it had no authority to constitute itself in this way, adding later that if it did so "any

recommendations made by it would have little standing".[25] After some debate it was decided that Auger should call another meeting within two months of delegates formally nominated by their national committees, and "empowered to create a Preparatory Committee for the establishment of plans for an extended European collaboration in space research." This body would nominate an Executive Secretary who would be expected to draft plans, with the help of experts, for a permanent organisation whose convention would be prepared for government signature "in the course of the next six months following the creation of the Preparatory Committee".[26]

As for infrastructural support, it was proposed that the Organization for European Economic Cooperation (OEEC) might be a suitable base for the group's activities. Auger was clearly bothered by this idea, pointing out, according to the minutes "that this should not involve the exertion of any influence by O.E.E.C. on the constitution or membership of the group." In fact what Auger feared was the dilution of the "purely" West European nature of any future organisation: a number of non-European member states, notably Canada and the USA, were about to enter the OEEC.[27] In response to these anxieties, Golay telephoned the appropriate office in Bern, and was authorised by his Federal authorities to offer all the necessary financial, administrative and diplomatic assistance for the preparatory arrangements for any approved cooperative scheme. It was left to Auger to explore both of these avenues as soon as possible.

* * *

The deliberations which we have described call for three comments. Firstly, there is the sense of urgency felt by the scientists. Indeed, it seems as though they hoped to have government agreement on a project within eight months of the April meeting. This feeling sprung partly perhaps from the fear that if they did not define a civilian space programme quickly political and military-related interests would steal a march

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[25] The first objection on constitutional grounds was raised by Sir William Hodge. The second objection was raised by J.A. Ratcliffe, who took over the chairmanship of the group towards the end of the meeting.

[26] The quotations are from the resolutions attached to document NCSP/80a (60) (cf. note 24) and from a report written by Auger in his capacity as the chairman of the French Comité des Recherches Spatiales. The report is entitled *Rapport sur la réunion, à Londres, de savants européens pour examiner les possibilités d'une coopération dans le domain des recherches spatiales*. It is dated 9/5/60 (folder *Origines de la COPERS I*, Mussard files, cf. note 1).

[27] See the report cited in the previous note. In December 1960 the OEEC was enlarged to include Canada and the USA, whereupon it became the OECD (Organization for Economic Cooperation and Development).

on them — space research was being discussed by the European Consultative Assembly and the OEEC in addition to NATO — leaving them with few resources and little or no control over the shape of a joint European space programme. In addition, at least for the British, there was the burning question of how to proceed with *Blue Streak* now that the government had decided to abandon it as a ballistic missile. Even as the scientists were deliberating at the Royal Society there were intense interdepartmental discussions going on inside the UK government around the possible options for the now obsolete rocket — including its use as a civilian launcher in a European space research programme.[28]

A second point to note is that at this stage the scientists interested in a European space effort were thinking of creating *one single organisation* dedicated to the development of launchers and to the placing of satellites in orbit. The details were of course still to be defined, notably the nature and the extent of the contribution to be made by continental countries towards the development of the launcher. But the principle was clear. In the words of the resolution passed by the group on 29 April 1960, those present were "strongly in favour of a cooperative effort by European nations towards further research in space science including the placing in orbit of artificial satellites by a launching vehicle developed and financed cooperatively."

This brings us to our third point — and here the contrast with CERN is striking —: the British scientists' enthusiasm, already manifest in February, to become involved in a joint European venture. On the face of it one would have expected them to be as reticent in this case as they had been in the early fifties about the setting up of a European nuclear physics laboratory. Now, as then, they were the undisputed leaders in Europe in the field, with a national research programme far more important than that of any of their potential partners. On the other hand now, unlike then, they were seeking partners in a field which was far more intellectually diverse and expensive than high-energy physics — and there was the problem of *Blue Streak*. One of those attending the meeting at the Royal Society was A.W. Lines, from the Royal Aircraft Establishment at Farnborough. Lines, Auger wrote afterwards, "in particular, was very explicit about his country wanting to see this programme [i.e., *Blue Streak*], now abandoned for military purposes, turned to civilian use." £56 million had already been spent on the project. With another £10 million per annum for three to five years,

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[28] For the options arrived at see the paper *Space Research: Blue Streak, Report by Officials* prepared for the UK government in around May/June 1960 (PRO—FO371/149657). A more detailed description of the debates about the launcher, and the formation of ELDO in particular, will be provided in a later report.

Lines said, the rocket could be used to put a 500 kg satellite into orbit. Reinforcing Lines' remarks other British delegates present had "stressed how encouraged their authorities would be if neighbouring European nations indicated their desire to cooperate civilly in space," referring to the list of CERN member states several times.[29] In the case of CERN British scientists had had to decide whether or not to participate in a programme whose outline was being progressively shaped by a group around Auger in 1951/52.[30] A decade later, in the case of space, British scientists had defined an ambitious satellite programme and British engineers had built rockets, initially for military purposes, which could be used to place their experiments in orbit. "Europeanisation" was a way of sharing costs on the former, and of saving the money and the expertise already invested in the latter.

3 June 1960. The formation of the GEERS

Auger set about the task of establishing the preparatory commission, as instructed by the resolutions passed at the Royal Society meeting, in the weeks that followed. In May he discussed with the OEEC and with Swiss representatives the terms and conditions under which they would support and finance the commission. He also obtained offers of support from his own national authorities.[31] Keen not to lose the momentum that the new venture seemed to have picked up, he called a meeting of interested delegates in Paris on 23 and 24 June 1960. The delegates had before them Auger's proposed "Draft Agreement Creating a Preparatory Commission for European Collaboration in the Field of Space Research".[32]

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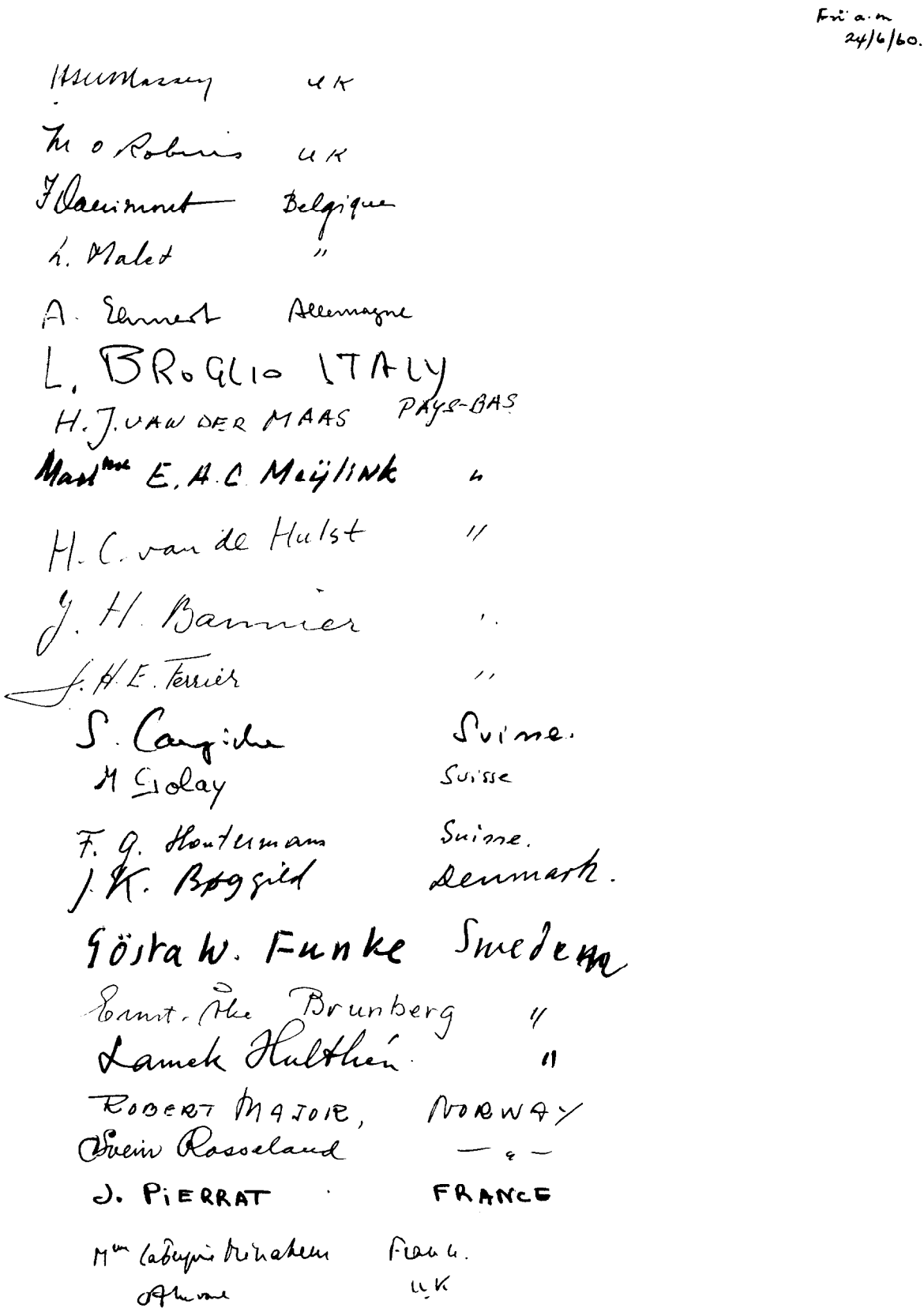
[29] See his *Rapport sur la réunion ...*, note 26 above.

[30] For the changing British attitudes on participation in CERN, see Krige in Hermann, Krige, Mersits and Pestre (1987), chapters 12 and 13.

[31] For brief information on Auger's activities during May, see the document *Date des Réunions Depuis l'Origine*, cited in note 2.

[32] There is a more or less verbatim French version of the minutes of this meeting, entitled *Groupe d'étude européen pour la collaboration dans le domain des recherches spatiales, réunions tenues à Paris les 23 et 24 juin 1960*, distinguished by morning and afternoon sessions, and a briefer English version of the minutes, entitled *Western European Space Research Meeting, 23/24 June 1960*, which was prepared, we believe, by the nominated British rapporteur, Dr. A.F. Moore and dated 4 July 1960. These documents along with other supporting material, including Auger's *Draft Agreement...* dated 21 June 1960 are to be found in the folder *Origines de la COPERS II*, Mussard files (cf. note 1).

Figure 1. The attendance register of some of those present at the meeting constituting the GEERS on the morning of Friday 24 June 1960 (folder *Origines de la COPERS II*, Mussard files (cf note 1)).



It rapidly emerged that it would be impossible to set up the preparatory commission at this meeting, as those who had gathered in April had hoped. For one thing the scientific programme of any envisaged European joint venture was not clear. And the British delegation insisted strongly that the precise domain in which European collaboration was to occur had to be clearly specified before any intergovernmental agreement was put forward for signature. The greatest uncertainty, of course, concerned the launcher. Should the development of *Blue Streak,* Massey asked, "be part of European cooperation, or should this cooperation be more specifically dedicated to the development of instruments to be flown on satellites or on the construction of the satellite itself?"[33]

Then there was the question of the membership of the preparatory commission, and of Australia in particular. Massey, while stressing that his government was keen to be involved in the activities of the commission, "stated that the position of Australia was a serious difficulty in connexion with United Kingdom participation in the work of the group." Several delegations (notably the Swiss) felt that the European character of the group should not be diluted. As Campiche put it "the reason for having this meeting was exactly to set up collaboration at the European level in this key domain, just as for the case of CERN."[34] But Massey was emphatic: the CERN arrangements made for collaboration with non-European member states would not suffice in this case, he said. Nor was he asking that an exception be made for the whole of the Commonwealth, as had been the concern of the British when the CERN Convention was drafted.[35] "The major United Kingdom launching site belonged to the Australian government," explained Massey, "and nothing must be done which would lead to the group being denied access to the launching facilities at Woomera." The form of words, Sir Harrie went on, was less important than the interpretation that may be put on them. These should not be such that they could "in any way lead to the withdrawal of Australian cooperation."[36]

Finally, it was clear that those present simply did not have the authority to take decisions which would be binding on their governments. True some national

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[33] From the French version of the minutes of the morning of 24/6/60 (cf note 32) our translation.

[34] *ibid.*

[35] See Krige in Hermann, Krige, Mersits and Pestre, chapter 8.2.2.

[36] From the English version of the minutes referred to in note 32 above.

authorities had sent senior members of the state apparatus to the meeting. France, for example, was represented by Auger along with a delegate from Foreign Affairs, from the Armées "Air", and from the Délégation Générale à la Recherche Scientifique et Technique. Similarly Belgium, the Netherlands, Sweden and Spain sent high level officials, some of them well-known in CERN circles (Bannier (NL), Funke (S) and Campiche (CH)). On the other hand important delegations like those from Italy and Britain were essentially represented by scientists — Broglio in the case of the former (Amaldi did not attend), and Massey, Moore and Robins in the case of the United Kingdom — with limited powers. To accelerate matters the Swedes proposed that the agreement be signed by representatives within the limits of the authority that each had, so that it would be a mixed or semi-governmental agreement. But it was not to be. Belgian delegate Darimont stressed that "the group must not forget that in Europe governments themselves are directly concerned with problems of space research. Contacts at the highest level have already taken place on this subject between ministers."[37] International organisations, Darimont went on, had discussed these questions, and the OEEC had already drawn up a broad outline of a possible scheme for collaboration in the field of space. That granted, the Belgians insisted, it would be fatal not to involve governments from the very start in the initiatives favoured by the scientists.

In the light of these considerations — and much to the distress of Auger, Bannier and Funke — it was decided that it was first necessary to establish a study group whose main tasks would be to continue with scientific and technical studies to define more precisely the areas in which European cooperation would take place, to draft a new agreement establishing the preparatory commission, and to convene a meeting of duly authorised representatives to sign the agreement. This intergovernmental meeting, it was thought, could be held within the course of the year (i.e. 1960). The preparatory commission would come into being shortly thereafter, its main task being to draft a convention and the associated protocols for a European space research organisation which would be submitted to prospective member states' governments for signature and parliamentary ratification.

The meeting duly constituted itself as the GEERS (Groupe d'Etude Européen pour la Collaboration dans le Domaine des Recherches Spatiales or, in the English version, The European Space Research Study Group) and nominated its bureau: H. Massey (UK), chairman, L. Broglio (I), M. Golay (CH) and L. Hulthén (S), vice-

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[37] From the French version of the minutes of the morning of 24/6/60 (cf note 32), our translation.

chairmen, and P. Auger (F) executive secretary. The French government's offer to host such a bureau was accepted on the grounds that it was more convenient since Auger would be the executive secretary. The Swiss in turn agreed to convene the intergovernmental meeting. A drafting committee was set up to modify the original paper prepared by Auger. It met under the chairmanship of Campiche on 5 July 1960 and rapidly converged on a new three-page draft agreement establishing the preparatory commission.[38]

With these procedural matters settled, the only remaining important point of discussion was the composition of technical study groups. According to the British version of the minutes, it was not clear whether these meetings should be attended by technical representatives from each of the countries present at the meeting, or "whether only those most intimately involved would be invited to the meeting regardless of nationality." Auger, in a brief set of remarks on the deliberations, was more explicit. Everyone understood, he said, that these meetings primarily concerned discussions between British and French experts (about the launcher).[39] All the same several other countries — he mentions Italy, the Netherlands and Sweden in particular — insisted on being involved in technical discussions from the very beginning. Their argument was that only in this way could they begin to gain the necessary experience in space research which until then had been a monopoly of the larger European countries.[40] In the light of these requests, Auger thought that a possible composition of the technical group would involve four experts each from Britain and from France and one each from the other eight member countries.

One comment by way of conclusion. The importance of this meeting in June 1960 lay in the fact that it was the first in which scientists dealt face to face with administrators from a variety of European countries interested in space research — and were confronted with the political implications of their project. For a space scientist par excellence like van de Hulst there really seemed to be no need to complicate matters by holding a conference of government representatives to sign

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[38] The draft entitled *Draft of an Agreement Creating a Preparatory Commission to Study the Possibilities of European Collaboration in the Field of Space Research* is document no. 1 rev. 3, Paris, 5/7/60 in folder *Origines de la COPERS II*, Mussard files (cf. note 1). The members of the drafting committee were S. Campiche (CH) (convenor), J.H. Ferrier (NL), L. Malet (B), A.F. Moore (UK) and P. Auger (F).

[39] See the document entitled *Remarques*, undated, unsigned, but clearly written by Auger just after the Paris meeting (folder *Origines de la COPERS II*, Mussard files, cf. note 1).

[40] See British version of the minutes cited in note 32 above.

what was after all only "a preliminary agreement which would lead to the creation of a small organisation with rather limited powers."[41] But this was not in fact possible. And it was not possible because, *in parallel* with the initiatives being taken by the scientists, there were high-level negotiations taking place between European governments, above all over the question of launchers. The main actors here were Britain and France with at least Belgium keeping a very close eye on developments. Indeed, according to an internal French document, from the time Britain decided to cancel its strategic military rocket *Blue Streak* in April 1960 it had "offered France the possibility of collaborating in the development of a satellite [launcher] using Blue Streak for the first stage, the experimental rocket Black Night (sic) for the second stage, and a third stage involving new ideas."[42] These negotiations were certainly behind Massey's insistence that, while it was most likely that Britain would join the work of the preparatory commission, it could not do so until it knew exactly what areas of collaboration were envisaged. Nothing concrete could now be done until the place of launchers in any future European scheme had been clarified.

4 *October 1960. Preparing for the intergovernmental meeting*

Auger's expectation that the technical working group would be limited to about 16 people was not to be realised. Indeed, no less than 36 experts attended the gathering held in the rooms of the Royal Society from 3 to 6 October 1960. About half of these were from Britain (nine delegates) and from France (eight delegates). Most other countries sent two or three representatives. Among the several new faces at the meeting, which seems to have comprised almost exclusively scientists and engineers, was a representative from Australia. After the deliberations by the experts Auger combined their various reports into a single document. This was to form a basis for the meeting of governmental representatives to be called by the Swiss.[43]

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[41] From the French version of the minutes cited in note 32 above, our translation.

[42] Unsigned document entitled *Propositions britanniques de collaboration dans le domaine spatial*, from the Délégation générale à la recherche scientifique et technique, Paris, 21/11/1960 (Archives Nationales, Mission Recherche, Paris, Re 130/31 Liasse 620. I am grateful to Lorenza Sebesta for finding a number of very useful documents in this source.)

[43] The paper is entitled *Report on the London meeting. 3-6 October 1960*, and it is document GEERS/3, dated 28/11/60. A copy is in folder *Origines de la COPERS III*, Mussard files (cf. note 1). It is extremely difficult to summarise this document. It is little more than a long list. An abbreviated version of the paper is published in Massey and Robins (1986), Annex 8.

Auger's synthesis comprised four main divisions. The first briefly described the scientific, technical, and economic advantages, as well as the indirect benefits to be had by European cooperation in the field of space research. This was followed by a section written by A.W. Lines and R.F. Boyd describing a possible scientific programme. Then came an outline, written by Auger himself, of the general principles and organisational structure of the envisaged European agency. Finally Auger's report described the activities to be undertaken by the preparatory commission which was to plan for the establishment of the permanent organisation. It was to have a secretariat and five working groups, it was expected to last for about a year, and its budget for that period was estimated to be of the order of 935,000 NFF (new French francs), over half of which was intended for the working groups.

One of the five working groups envisaged was to draft the proposed administrative and technical framework of the new agency. The other four would deal exclusively with scientific and technical matters. One would be responsible for defining the scientific programme, to be based essentially on sounding rockets and satellites. Another was to be a group of rocketry experts "whose task [would] be to study the existing possibilities in obtaining vehicles and using launching sites." This group would look into the possible use of European missiles like *Blue Streak*, as well study the conditions under which American missiles like *Thor* and *Atlas* could be obtained. As for launching sites, the report mentioned Colomb-Bechar — the French military base in the Sahara — Woomera in Australia and Cape Canaveral in Florida. A third group would be needed "to make proposals for scientific and technological research in such fields as propulsion, power sources, information storage and transmission, solid state physics, [...]." This activity, the experts suggested, should take up a rather important slice of the agency's budget since in addition to their intrinsic scientific interest, such studies promoted "general technological progress", as well as stimulating industrial development in the member states. Finally, there would be a group of scientists responsible for exploring the possibilities of setting up and using networks of telemetry and tracking stations both for satellites orbiting the earth and for deep space probes.

The underlying philosophy and a possible organisational scheme of the new European agency were also defined by the experts in the autumn 1960 meeting. It was essential, they said, that the agency be involved in all stages of space research from securing vehicles and using launching sites to the exploitation of the scientific results and the processing of the data. Its international character, they went on, should be reflected in the geographical distribution of its establishments, in the composition of

its scientific and technical personnel, and in the allocation of contracts to industry. At the same time they insisted that it should not compete with national efforts in the member states: it was to "help" "and enhance their efficiency but in no case supplant them."

The main facility of the agency foreseen in October 1960 was a central establishment dedicated to the development and construction of satellites and scientific equipment. Its programme of research would be defined by a scientific policy committee comprised of scientists and engineers. Administrative and budgetary decisions would be in the hands of a council composed of member states delegates.

The broad outlines of a possible scientific programme were sketched. Concerning sounding rockets, the envisaged organization could, for example, approve the scientific programme, coordinate the buying and distribution of the rockets, integrate, engineer and test the payloads, obtain access for scientists to existing launching sites, organise the testing and firing of the rockets, and, finally, collect and disseminate data on telemetry and tracking systems and equipment. As for satellites, "the Agency should administer funds large enough to provide scientists with missiles enabling them to put satellites in orbit, and develop the required instrumentation." A three phase programme was described. The first, lasting about three years, would include putting into orbit satellites of approximately 100 kg for scientific research. Although the experiments would not be sophisticated they would serve "to build up European scientific teams with enough experiments to make a full contribution to space research". In the second phase, which would start after about five years, satellites of 500-1000 kg would be launched into terrestrial orbit and lighter payloads into the lunar field. Here more sophisticated experiments like the detailed study of stellar ultraviolet and X-ray spectra would be undertaken. Finally, there was the third phase, to be developed in parallel with the first two. In this phase the aim would be to study projects "likely to end up, during the following years, in the development of devices capable of landing scientific equipment on the moon, exploring other planets and studying the sun's neighbourhood." For this it was necessary for the agency, *inter alia*, to undertake research from the start in the "advanced systems, that this phase of the programme demanded."

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The determination of the scientists to control, as far as possible, the new European space research organisation emerges from these deliberations. The programme was to be chosen first by a scientific committee, which would make its recommendations to a Council, in which "overall control on policy and finance" were vested.[44] Scientists would undoubtedly serve on both. What was "omitted" was an administrative and finance committee, a committee of Council, like the scientific committee, but this time composed of national science administrators (at least in the case of CERN) who were responsible above all for recommending acceptable levels of the organization's budget. By lopping off the main organ through which national treasuries could make their presence felt, the scientists doubtless hoped to reduce bureaucratic and political influence on the shape of the organization to the minimum.

The second striking point about this meeting is that the delegates did not discuss, as they had in April, collaborating in the development of *Blue Streak* as a European launcher. This was partly because Anglo-French negotiations in this regard were still under way and, to quote Massey and Robins, "the UK delegates to the Technical Discussion meeting were asked not to refer to the matter in any way during the meeting".[45] At the same time it is noteworthy that, in so far as *Blue Streak* and Australia were mentioned at the meeting, they were seen as one option among others, which included using American launchers and French and American launching bases. In other words, whatever the outcome of the political negotiations over the launcher, the technical experts were already beginning to distance themselves from the issue, to consider alternative ways of achieving their scientific objectives. And to narrow the scope of "their" space organization accordingly.

5 *November/December 1960. The intergovernmental conference at CERN and the setting up of the COPERS*

The meeting of authorised governmental representatives was duly convoked by the Swiss government. It took place at CERN in Meyrin (a suburb of Geneva) from 28 November to 1 December 1960.[46] It was attended by mixed delegations of scientists

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[44] For more material on this, and an organigramme of the envisaged organization see Massey and Robins (1986), 116.

[45] Massey and Robins (1986), 115. The authors remark that "this was somewhat embarrassing because some of the delegates from the Continent already knew quite a lot about it."

[46] A report on the proceedings of this conference drafted by J.H. Bannier, its rapporteur, and labelled document CIRS/4/rev is available in box 787, EUI Archives, Florence. Its annexes include the introductory speeches to the conference (Annex 1), amendments to the draft agreement proposed by the Dutch delegation (Annex 2), and the Resolution drafted by one of the

and government officials, notably from the departments of foreign affairs, from the now usual ten countries plus Spain, which was initially admitted as an observer and later as a full participant in the conference proceedings.

After being welcomed by Max Petitpierre, the president of the Swiss confederation, and François de Rose, the president of the CERN Council and the head of the French delegation, those present elected their bureau. Sir Harrie Massey (UK) was elected chairman of the conference by acclamation, Broglio (I) and Golay (CH) were appointed vice-chairmen, Auger (F) was appointed secretary, and Bannier (NL) was elected rapporteur. After a preliminary exchange of views three working groups were set up. The first, chaired by Campiche (CH), was called on to study the legal aspects of the draft agreement. The second, chaired by Funke (S), was to study the proposed budget and scale of contributions to the envisaged Preparatory Commission. Finally and most importantly, there was the working group chaired by Golay (CH), whose task it was to study the scientific and technical objectives of the organisation to be created. The working groups spent two full days in discussion, submitting their reports after lunch on 30 November. On the last morning the final touches were put to the draft agreement, arrangements were made for the interim period between the conference and the setting up of a "Preparatory Commission to Study the Possibilities of European Collaboration in the Field of Space Research", and a budget for the first year of the preparatory commission (935,000 NFF) and scale of contributions (those in force at CERN) were settled. The agreement establishing the COPERS was opened for signature at 4 pm on the afternoon of 1 December 1960.

The proceedings at Geneva were overshadowed by new developments on the question of launchers. In the weeks before the Meyrin conference there had been intense activity in both Britain and France. According to a French source, in September 1960 there was mounting pressure on his government to react positively to the UK's proposal to have France collaborate in the development of a rocket using

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working groups which was set up by the conference (Annex 3). In the same box one finds the draft agreement setting up the Preparatory Commission, document CIRS/1/rev. 7, 1/12/60. A copy of this report without the annexes can also be found in the folder *Origines de la COPERS IV*, Mussard files (cf. note 1). This folder also contains a number of other documents and letters relevant to the conference, in particular a report of the proceedings written by Auger in his capacity as the chairman of the French committee for space research. It is entitled *Compte rendu sommaire de la conférence intergouvernementale sur la recherche spatiale tenue à Genève, du 28 novembre au 1er décembre 1960*. There are two versions of this report, a preliminary version which is undated, and a final version dated 5/12/60.

Figure 2. The delegates to the Meyrin conference held from 28 November to 1 December 1960 standing in front of CERN's Main Building (folder *Origines de la COPERS IV*, Mussard files (cf note 1)).

Blue Streak as a first stage, and possibly *Black Knight* as a second.[47] Several technical and ministerial exchanges took place between the two countries and a meeting presided by the Prime Minister was held in November to establish the French position. Here it was decided that "France was willing to associate itself with the British government in a proposal to other European states that a study be made of the technical and financial possibilities of building in Europe a rocket system able to put heavy satellites in orbit". In return, though, it was a necessary, but not sufficient condition for any such collaboration that the second stage of the rocket be built in France, and not be *Black Knight.*[48]

By the end of November, then, it looked increasingly likely that Britain and France would jointly propose a launcher programme to their European partners on terms and conditions still to be arranged. Neither wanted the issue discussed at Meyrin. At the outset the leader of the British delegation, R.N. Quirk, made it clear that in his view "the main purpose of the present Conference was to come to an agreement about the legal document that would establish the Preparatory Commission and about the budgetary arrangements which the creation of the Commission would entail." As for its scientific and technical objectives, he said a little later, "it would be desirable to define them briefly and exclude such questions as rockets and telecommunications from discussions at this stage." The leader of the French delegation was quick to support him. "The problem of rocket vehicles should not be considered by the Conference," said de Rose. It was possible, he went on, to separate the scientific aspects of space research from that concerning the development and construction of space vehicles in Europe. "The French government was prepared to consider the possibility of developing suitable rockets in Europe," said de Rose, "but not within the terms of reference of the present Conference or of the Preparatory Commission. An organisation," he went on, "could be set up in Europe to carry out space research without developing its own rockets."[49] The British and French governments, in other words, were now absolutely determined to keep scientific

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[47] See the unsigned document *Proposition Britannique de Collaboration dans le Domaine Spatiale*, 21/11/60, produced by the Délégation Générale à la Recherche Scientifique et Technique (Archives Nationales, Mission Recherche, Re 130/31, Liasse 620).

[48] See the *Procès-Verbal de la 22ème Réunion du Comité des Recherches Spatiales tenue le 14 Décembre 1960*, dated 20/12/60, at which de Rose explained developments in the Anglo-French negotiations over the launcher (Archives Nationales, Mission Recherche, Re 130/31, Liasse 620). Our translation of what appears to be a verbatim statement. .

[49] From Bannier's report on the meeting cited in note 46 above.

research in space separate from applications on the one hand, and, more fundamentally, from the construction and development of launchers on the other.

The main arguments given at the meeting against "creating an organisation that would not only carry out space research but also develop large rockets" (Quirk) were of a financial nature. Firstly, it was pointed out that since the latter part of such a programme would cost far more than the former it was likely that the scientific part "would become a very small fraction of the whole project" (de Rose), so not only being swamped but also marginalised. Secondly, it was stressed that the added burden imposed by including rocket construction along with scientific research might frighten off some governments, notably those from the smaller member states, from joining a space organisation. This would not only dilute its European character but increase the already heavy burden borne by the remaining member states.

The weight of these considerations was reinforced by the fact that the scientific communities in some countries were becoming increasingly dubious about including launcher development along with space research in the same organization. This was particularly so in Britain and France, where space scientists hoped to have important national research programmes. Both communities feared that if European research in space science was funded from the same source as the construction of launchers it could only be at the expense of their national plans. Massey posed the problem in terms of the danger to scientific research as a whole. "We do not want to set up a European NASA," he is alleged to have said. "The funds given to a new research agency must not be excessive with respect to the funds allocated to other scientific fields, and thus one cannot consider financing within this framework the development of costly vehicles or of important fixed installations." The role of any new organisation, Massey went on, should be directed exclusively towards scientific research.[50] A French committee for space research meeting about a fortnight before reached a similar conclusion. It remarked that the British government's proposal for building a satellite launcher in common was not without interest. If the scheme went ahead as hoped, it would rapidly enable French scientists to put payloads in orbit which were heavier than those then being launched by the United States. At the same time the committee expressed its concern at the possibility of there being "an important disequilibrium" between the expenditure required for building launchers and what would then be available for the construction and exploitation of the scientific equipment. It was certainly useful for France to explore the possibility

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[50] From Auger's *Compte rendu sommaire* ... dated 5/12/60, and cited in note 46 above.

opened up by the British proposal, the committee concluded, but only on condition that "the national programme for space science research was not in any way reduced." And there was an alternative — the French scientists drew attention to the advantages of having NASA launch French satellites on the same terms as had recently been agreed with their British colleagues.[51]

At the Meyrin conference only the Swedish delegation, of those whose reactions are recorded in the minutes, was unambiguously in favour of the Anglo-French wish to hive off launchers from satellites. This was doubtless for reasons of cost and to protect its neutrality. "The development of launchers was a problem for highly industrialised countries and should be kept separate from the problem of Space Research," the Scandinavian delegate said. Apart from that, the Belgians, in particular, were strongly opposed. "There should be only one international organisation in Europe responsible for the design and development of rockets, space research and the exploitation of results," said their delegate Depasse. The Dutch, the Swiss, and the Italians were similarly concerned though not prepared to argue for a single organisation. The development of rockets, van de Hulst pointed out, required a considerable amount of scientific research, and Europe had much to learn in this regard. One should not exclude the development of rockets altogether, said Golay, since those available might not be adapted to the needs which European scientists had. While it was certainly of little interest to devote important sums to the construction of rockets in the short term, said Broglio, "as a long term project however, the development of rockets by the Space Research Organisation might prove cheaper than purchasing launchers or having them developed under contract by other organisations."[52]

It was inevitably the view of the two most powerful countries (the German delegation having no authority to speak on the matter) that prevailed in the resolution passed by the meeting. The task of the preparatory commission would be to "consider arrangements for the design, development and construction of space research

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[51] See document *Examen de la Proposition Britannique par le Comité des Recherches Spatiales*, Paris 16/11/1960 (Archives Nationales, Mission Recherche, Re 130/31 Liasse 620). The committee pointed out that its five year plan for the years 1961-1965 was estimated to cost 130 million NF, and that a further 100 million NF would probably be required for a European collaborative effort in space science. The cost to France of collaborating with the British on launchers was estimated to be roughly the same as the sum of these together (250 million NF spread over five years).

[52] All these quotations are from Bannier's report on the conference proceedings cited in note 46 above.

satellites, and arrangements for the launching of such satellites." The commission was then instructed to "take note of the negotiations separately in progress among certain Member States of the Conference for the collaborative development of a satellite launcher." "In the event of an organisation being created" for this purpose it was to "consider the closest possible co-operation between this organisation and the contemplated European Space Research Organisation."[53] Countries like Belgium who feared that, if they did not participate in a rocket programme, they would be deprived of "knowledge and experience which would be of more direct economic utility than that which could be had from an organisation concerned principally with satellites," were compensated in the preamble to the agreement setting up the preparatory commission.[54] In line with a Dutch amendment, the scope of the envisaged organisation was expanded beyond "collaboration in the field of space research" to "collaboration in research in space science and space technology and in the pooling of the knowledge thereof."[55]

The decision that the preparatory commission should not concern itself with launchers solved, or rather dissolved, one major problem: the question of Australia. The agreement establishing the COPERS, while insisting that new members be accepted unanimously, stated clearly that these should be European states. "Other states", it added, could "associate themselves" with the COPERS's work, again by unanimous agreement. There was no important debate over these now uncontroversial restrictions.[56]

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The "Meyrin" agreement setting up the preparatory commission was signed on 1 December 1960 without reserve by representatives from five states (Belgium and

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[53] See Annex 3 to Bannier's report quoted in note 46 above.

[54] The quotation is from a *Note aux chefs de la division des organisations internationales*, 17/11/60, written by Campiche and copied to Auger, in which he reported on a meeting he had had with the Belgian Ambassador that day. According to this note Campiche hoped that countries supplying rockets to the new organisation would allow the technicians from its member states to take part in the elaboration of rocket projects. From the folder *Origines de la COPERS IV*, Mussard files (cf. note 1).

[55] The first formulation is from a draft of the agreement proposed by the French delegation, document GEERS/1/rev 4, 28/11/60 in the folder *Origines de la COPERS IV*, Mussard files (cf. note 1). The second formulation is from the final agreement, document CIRS/1/rev 7, 1/12/60 in box 787, ESA Archives, EUI, Florence.

[56] See Article 2 of the Agreement, document CIRS/1/Rev. 7, 1/12/60, box 787 ESA Archives.

the Netherlands, Norway and Sweden, and the United Kingdom), and subject to reservation by representatives from five others (Denmark, France, Italy, Spain, and Switzerland). The German delegate had no authority to sign the document, but made it clear that this was for purely formal reasons and that he would do so in due course. With the deposit of the instruments of ratification by France (27 January 1960) and Switzerland (24 February 1960), and the subsequent signature without reserve by Germany, eight countries totalling 83.46% of the budget had become parties to the agreement. With the conditions satisfied (signature, with ratification if necessary, by six member states contributing at least 70% of the budget), it entered into force on 27 February 1961. The first session of the European Preparatory Commission for Space Research (COPERS) was held a fortnight later in Paris from 13-14 March 1961.[57]

In parallel with these developments the British and French governments continued their discussions about the launcher. Early in December a UK technical mission was sent across the Channel to explore the implications of the French demand that they be responsible for the second stage of a jointly developed rocket. The conclusions they drew were explained to the French government on 12 December by Peter Thorneycroft, the British Minister of Aviation. Britain, he said, was prepared to see a French rocket atop *Blue Streak* instead of its own *Black Knight*, and British firms would even be available to act as consultants to the French, who seemed to be technically somewhat behind their UK counterparts — but on condition that France paid the same fraction as Britain of the costs of the launcher. France made it clear that she could not accept a financial burden of this magnitude.[58] An agreement was hammered out at an intergovernmental meeting called by the two countries and held at Strasbourg from 30 January to 2 February 1961. A programme was adopted for the development of a three-stage launcher with the first built by the UK, the second by France and the third, as well as a series of test satellites, by other member states. It was accepted that France, Germany and Italy would contribute to the costs of the programme, estimated at £70 million over five years for the vehicle, at the rate of their contributions to the CERN budget, which was based on national income (i.e. about 21%, 20%, and 10%, respectively, in 1960). Britain, for her part, instead of paying the 25% that she contributed to CERN would pay 33.33% of the whole. The benefit of her additional investment was to be handed on to smaller contributors,

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[57] For information in this paragraph see the minutes of the first session of the COPERS, COPERS/Min/1.

[58] For details on the Anglo-French negotiations in this period as seen by the French see the *Procès-Verbal* ... cited in note 48. Further details on these matters will be given a later report dealing with the setting up of ELDO.

whose shares would be reduced accordingly. "This British proposal was decisive for the future of the undertaking", we are told.[59] By February 1961 it was clear that Europe would enter space with not one organisation, as Amaldi and Auger had thought that spring day in Paris almost two years before, but with two.

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[59] From the ELDO *Report to the Council of Europe 1965*, pp. 7-8.

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