ALEXIS DE GREIFF*

The tale of two peripheries: The creation of the International Centre for Theoretical Physics in Trieste

> A frontier is a strip which divides and links, a sour gash like a wound which heals with difficulty, a no-man's land, a mixed territory, whose inhabitants often feel that they do not belong to any clearly-defined country, or at least they do not belong to any country with that obvious certainty with which one usually identifies with ones native land.
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> Ara and Magris[1]

IN THE SECOND half of the 20th century, the International Centre for Theoretical Physics (ICTP) at Trieste was the most important and active institution devoted to scientific co-operation between Third World and industrialized countries. Between 1964 and 1980, more than 6,000 theoretical physicists and mathematicians from the so-called developing countries (and nearly the same number from the industrialised world) used the Centre's facilities. This impressive figure is consistent with the ICTP's estimates that at least one physicist from every Third World physics institute has visited the Centre at least once.[2] As the first United Nations

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The following abbreviations are used: ADF, Archivi del Dipartimento di Fisica, University of Trieste, Trieste, Italy; ASP, Abdus Salam Papers, NCUACS catalogue no. 99/4/1, "Abdus Salam" International Centre for Theoretical Physics Library, Trieste, Italy; EAP, Edoardo Amaldi Papers, Archivi del Dipartimento di Fisica, Università "La Sapienza" di Roma, Rome, Italy; IRP, Isidor I. Rabi Papers, Library of Congress, Washington D.C.; FFA, Ford Foundation Archives, Ford Foundation, New York; JRO, Julius Robert Oppenheimer Papers, Library of Congress, Washington D.C.

1. Angelo Ara and Claudio Magris, *Trieste. Un'identita di frontiera* (Torino, 1987), 192; trans. Lucretia Steward. The rest of translations in the text are all mine.

2. Alexis De Greiff, "The International Centre for Theoretical Physics, 1960-1979: Ideology and practice in a United Nations institution for scientific co-operation and Third World development" (PhD Dissertation, University of London, 2001), 290-292.

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institution entirely devoted to scientific training and research, it provided the model for several organizations that now play an important role in science, technology, and development policies in the Third World.[3]

The history and origins of the ICTP have been associated with Abdus Salam (1926-1996), probably the best known scientist from Pakistan. After finishing his Ph.D. at Cambridge in 1951, Salam returned home briefly before settling in England, in 1958, as the first professor of theoretical physics at Imperial College, London. During the 1950s and through the 1960s, Salam was considered one of the most brilliant theoretical physicists of his generation. In 1979, he shared the Nobel prize for physics with Sheldom Glashow and Steven Weinberg for their contributions to the "standard model" of particle physics.[4] From the late 1950s, his scientific career developed in parallel with his rapid political rise in Pakistan and abroad. As a member of the Pakistani delegation to the then-new International Atomic Energy Agency (IAEA), Salam urged the building of a scientific elite in the Third World through the creation of an international scientific center. Eventually, this idea turned into the ICTP, and Salam its director for nearly thirty years. His collaborators and colleagues remember the leadership, enthusiasm, scientific credentials, political sense, and diplomatic skills of the first Muslim to receive the Nobel prize and the most influential scientific diplomat from Pakistan. The ICTP is now known officially as the "Abdus Salam" International Centre for Theoretical Physics. Salam's high profile made the ICTP particularly susceptible to the "standard view of institutional histories."[5] This is a retrospective rational reconstruction that reduces the number of actors and crucial events to the minimum, in such a way that the story can be easily remembered and retold to outsiders and newcomers. When these stories concern the creation of institutions, they become textbook examples of what anthropologists call "myths of origin."

Although Salam's initiative was obviously important, the standard and widespread version of the origins of the Centre, contrast with the relative invisibility of Salam during the early phase.[6] ICTP resulted from complex negotiations involving physicists, diplomats, and science administrators from Europe, the United States, and some Third World countries. Similar actors have already been identified as central in the "pre-history" of the other institutions such as CERN.[7] However, in contrast to Pestre and Krige's study, the pre-history of the ICTP involved a set of

3. For instance, the Centro Internacional de Física in Santafé de Bogotá (Colombia) and the Korean Advanced Institute of Science and Technology (see Dong-Won Kim's contribution in this volume).

4. Jagjit Singh, *Abdus Salam: A biography* (Calcutta, 1992), 10-65.

5. See John Krige, "Some methodological problems in writing the history of CERN," in *Physicists look back. Studies in the history of physics*, ed. John Roche (Oxford, 1987), 66-77.

6. See the ICTP's official website http://www.ictp.trieste.it/ [Sep 2002]

7. Dominique Pestre, "The first suggestions: 1949-June 1950," in *History of CERN,* Vol. 1, ed. Armin Hermann, John Krige, Ulrike Mersits and Dominque Pestre (Amsterdam, 1987), 63-96, on 64.

actors apparently absent from the CERN negotiations: the local political and intellectual elite. In addition to local actors, we have a set of global actors, novel in the history of "Big Science," namely the Third World scientific communities. Differing images of the Third World and its "basic needs," and arguments over the role of science and technology in Third World development, were new variables in the history of international physics institutions.

1. INTERNATIONALIST DREAMS OF AN ORPHAN CITY

With the transformation of the Austro-Hungarian Empire into a modern state in the late 18th century, Trieste became its strategic port.[8] Mercantile activities and the insurance business dominated Trieste's economy; the cosmopolitanism of its entrepreneurial mercantile and financial bourgeoisie gave it the character of an international city.[9] No other Italian city had its future so dramatically determined by its geopolitical situation. But with the end of the Austrian Empire in 1918 and the "liberation" of Trieste, prosperity came to an end. In spite of its efforts to maintain its links with Central Europe, Trieste lost contact with its hinterland and slipped into political isolation and economic decline. Culturally, it lost its function as an interface between Mitteleuropean German culture and Italy although German remained the language of the educated classes.[10] Psychologically,a sense of fracture prevailed between memories of a glorious but irrecoverable past and the reality of a peripheral Italian center with an unpromising future. Socially, the previous dynamics of mutual isolation between the different ethnic groups, particularly the Italians and the Slavs, turned into an open confrontation modulated by international tension with Yugoslavia. The situation worsened when the Fascist regime imposed a total Italianization of the Slovenian and Croatian populations.[11] After World War II Trieste and the Istria peninsula continued to nurse its identity crisis on the edge of the Iron Curtain. In 1954, after several attempts to ease relations on the border between Italy and Yugoslavia, occupation by the Allied troops.[12]

8. Ara and Magris (ref. 1); and the following essays in Elio Apih, "La storia politica e sociale," in Elio Apih, *Trieste* (Rome, 1988), 5-208; Giulio Sapelli, "Il profilo del 'Destino Economico,'" ibid., 209-272; Elio Guagnini, "La Cultura: Una fisionomia difficile," ibid., 273-396. Nicola Powell, *Travellers to Trieste. The history of a city* (London, 1977); Jan Morris, *Trieste and the meaning of nowhere* (London, 2001).

9. Angelo Vivante, *Irredentismo Adriatico. Contributo alla discussione sui rapporti austro-italiani*, Vol. 1 (Florence, 1912).

10. Ara and Magris (ref. 1), 109-113.

11. Ara and Magris (ref. 1), 114-132;. see Apih in Apih (ref. 8), chapt. 5. The Italianization implied the substitution of Italian for Slavic names, as Budini for Budinich.

12. Geoffrey Cox, *La corsa per Trieste* (Gorizia, 1985); Diego De Castro, *Memorie di un novantenne: Trieste e Istria* (Trieste, 1999), 162-190; Robert W. Cox and Harold K. Jacobson, eds. *The anatomy of influence* (New Haven, 1973); Diego De Castro, *La Questione di Trieste: Lazione politica e diplomatica italiana dal 1943* (Trieste, 1986); Giampaolo Valdevit, *La*

The Triestini were actively though marginally involved in the negotiations, which unfolded in hermetic secrecy. Exclusion of the Trieste diplomats from crucial decisions left a strong sense of distrust of Rome. The loss of Istria was felt as treason. Trieste developed the sense of being an orphan.[13]

By 1954, the city's economy was catastrophic; all economic indicators fell while unemployment grew.[14] Young professionals fled. Trieste became an old city in every sense of the word; a very low birth rate accompanied a longer life expectancy; physical isolation aggravated political, economic, and cultural insularity. The city was not connected to the Italian highway system until the 1960s. Trieste had no airport apart from a small military base in Ronchi, 30 kilometres from its center. The modernization of infrastructure created a new source of tension with Rome.[15] Crisis, catalyzed by the complex political and social anxieties of the Balkans, Italian nationalism and the Cold War worsened in the 1950s.[16]

One sector escaped to the general decline: the insurance companies, which represented a special type of economy and boosted internationalist ideology. Following their example, Trieste's elite sought to reinvent itself as the Mittleeuropean, cosmopolitan, bourgeois city it had been.[17]

The most important group of internationalists clustered around the cultural review *Umana* created in 1918 by the socialist writer Silvio Benco. In 1951, after a long dormant period, it reappeared under the leadership of his daughter, Aurelia Gruber-Benco. *Umana* mobilized local, national, and international authors to write about literature, visual arts, philosophy, music, cultural policy, and science and technology. The Prince of Duino (a little town on the Western cost of Trieste), Raimondo della Torre e Tasso, who later championed the idea of sponsoring cultural and scientific enterprises in Trieste including the ICTP, was particularly close to Gruber-Benco.[18]

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questione di Trieste 1941-1954: Politica internazionale e contesto locale (Milan, 1986); Luigi Vittorio Ferraris, *Manuale della politica estera italiana, 1947-1993* (Rome, 1996), 24-30.

13. Manlio Cecovini, *Del patriotismo di Trieste, Discorso di un triestino agli Italiani nel cinquantenario della redenzione* (Milan, 1968); Apih in Apih (ref. 8), 193.

14. Apih in Apih (ref. 8), 185, 201.

15. Corrado Belci, *Trieste: Memorie di Trent'anni (1945-1975)* (Brescia, 1989), 65-70; Pierpaolo Luzzato Fegiz, *Lettere da Zadobaski. Ricordi di un Borghese Mitteleuropeo* (Trieste, 1984), 388-394.

16. Paul Ginsborg, *Storia d'Italia dal dopoguerra a oggi. Società e politica 1943-1988* (Turin, 1989), 345; Paolo Venier, "Le elezioni del novembre 1962," *Rivista Mensile Città di Trieste* (Jan, 1963), 3-6; Guido Botteri et al., *Trieste e la sua storia* (Trieste, 1986).

17. Sapelli (ref. 8), 243.

18. Aurelia Gruber-Benco, ed., *Antologia di Umana. Rivista di politica e Cultura. 1951-1973* (Trieste, 1986), 4, 6; Luigi Stasi, "Il sogno triestino vissuto all'Università," in Guido Botteri, ed., *L'Università di Trieste. Settant'anni di Storia (1924-1994)* (Trieste, 1997), 342-360.

2. THE FIRST ATTEMPT TO BUILD A UTOPIA

Paolo Budinich was born in Lussingrande in 1916. During his lifetime,[19] Lussino belonged to four different countries. In 1918, it passed from Austria to the Kingdom of Italy, in 1946 to Yugoslavia, and at the end of the century to Croatia. Paolo spent his infancy and adolescence between Trieste and Lussingrande. Like the majority of Trieste's elite, he studied in *Liceo Dante Alighieri*, from which he graduated in 1934. With the ascent of the Fascist regime in 1922, the family name changed to Budini; Paolo readopted the Slavic form in the 1980s.[20] His family could not afford to send him to the university. He competed for a national fellowship to study at the Scuola Normale di Pisa, but failed. With the meager monies his father could send from Trieste, he paid one of the examiners to tutor him to take the exam the following year. He succeeded and graduated from the Normale in 1939 with a thesis on experimental spectroscopy.[21]

When the war broke out, Budinich enlisted in the Italian Navy. He served first on a submarine and then piloted reconnaissance aircraft. During a mission, and under unclear circumstances, he was captured by the English and sent to a camp for prisoners of war in the United States. In 1945, Budinich returned to occupied Trieste. After hesitating whether to pursue a scientific career at Trieste or accept an invitation to work on L'*Unità* (the communist official newspaper), he joined the just-founded Physics Institute at the University of Trieste. In 1946, Nestore Cacciapuoti, from the University of Rome, became its director; a year later he took a leave to advise UNESCO on scientific matters in Latin America and the experimentalist Gianni Poiani acted in his place with assistance from physicists from Padua University, particularly Nicolò Dallaporta and Antonio Rostagni.[22] Budinich joined the university as Francesco Vercelli's assistant in the course of rational mechanics. After seven years of inactivity in experimental physics, he turned his hand to theory.

To update his knowledge, Budinich visited Edoardo Amaldi's institute in Rome in 1951, returning with a study plan prepared by Bruno Ferretti.[23] Too old to do graduate work in England or the United States, he went to Germany with a fellowship from the Italian Foreign Affairs Ministry to work with Heisenberg at the Max Planck Institute in Göttingen. He started research on the meson component in cosmic rays, a line he pursued for several years, and established contacts with Central

19. Paolo Budinich, *L'arcipielago delle meraviglie* (Rome, 2000), 10, and "All'inizio eravamo in quattro," in Marco Budinich and Gianni Vannini, eds., *La Ricerca in Fisica nell'Università di Trieste* (Trieste, 1995), 131-140.

20. In this paper I will use the Slavic form, except in references to primary sources.

21. Paolo Budini, "Sull'allargamento e spostamento delle righe spettroscopiche," *Nuovo cimento, 16* (1939), 86-107.

22. "Cronistoria Dell'Istituto di Fisica Dell'Università di Trieste," undated [but probably 1963], ADF. Guido Botteri (ref. 18), chapt. 4.

23. Budini to Amaldi, 13 Mar 1951, Box 140, folder 1/2, EAP.

European physicists, especially K. Lehman, K. Symanzik, R. Olhme, G. Ludens, and Walter Thirring.[24] He also maintained correspondence with Amaldi.[25]

Back in Trieste, Budinich realized the importance of linking his Institute to European centers. He started a seminar on mathematical physics to which he invited many of the physicists he had met in Göttingen, Vienna, Graz, Prague, Ljubljana, Budapest, and Zagreb. In 1954 he visited Germany and Switzerland to forge contacts with Pauli and other Swiss physicists. That year Budinich became professor of theoretical physics and integrated advanced mathematical physics into the curriculum of the Institute. When he took on the directorship of the Institute in 1955 theoretical physics was still very weak there.[26]

Possibly at Cacciapuoti's suggestion Budinich turned to UNESCO to help bring the Institute in from the periphery. A plan jointly proposed by Walter Thirring (in Vienna), George Marx (in Budapest), Ivan Supek (Zagreb) and Milan Osredkar (Lubiana) to set up a network of scientific institutes was then (1957) under discussion. Trieste was to be the coordinating center. The Foreign Affairs Ministry authorized Budinich to negotiate on behalf of Italy at UNESCO. The enterprise failed because of the tense relations between Western and Eastern Europe.[27] Neverthless, with the support of the Physics Department in Padua and of Amaldi in Rome, Budinich established a branch of the National Institute for Nuclear Physics (Instituto Nazionale di Fisica Nucleare, INFN), of which he was director for several years. A few years later, "in a completely unexpected way, the miracle arrived, and the utopia came into being."[28]

3. THE SEVEN STEPS
The idea of an international center

Salam first met Budinich in 1960. Despite the discouraging experience at UNESCO, Budinich had continued his activities to internationalize the Physics Institute. He and Claudio Villi, one the first students to graduate from the Institute, organized a symposium on elementary particle interactions held in June at the Miramare Castle near Trieste. Its participants included Giuseppe Furlan, Nicolò Dallaporta, Jacques Prentki, Sergio Fubini, Daniele Amati, Bruno Vitale, Walter Thirring, Gordon Feldman and Abdus Salam. They were enchanted by Trieste's

24. Budinich (ref. 19), 31.
25. Budini to Amaldi, 7 Mar 1952, Box 140, folder 1/2, EAP.
26. "Memoranda sull'attività svolta dal direttore dell'Istituto di Fisica e dai suoi collaboratori," ADF.
27. Budinich, *L'arcipielago* (ref. 19), 43-47. A similar idea, suggested by the Communist British mathematician Hyman Levy, was brought by Henri Laguier, a leftist and former head of the French National Science Council, to the United Nations. Aant Elzinga, "Unesco and the politics of scientific internationalism," in Aant Elzinga and Catharina Landström, eds., *Internationalism and science* (London, 1996), 89-131.
28. Budinich (ref. 19), 47.

hospitality. Feldman and Salam wrote a note in *Physics today* that stressed the relaxing atmosphere and the beauty of the place and announced that Budinich intended to make the symposium an annual event.[29]

In August, Salam attended the Rochester Conference, a series organized by Robert Marshak, which began as a national gathering and in the late 1950s became the most important international meeting in high-energy physics.[30] However, the Cold War disrupted the conference. In 1960, several top Soviet delegates did not attend.[31] The main speaker, John McCone, Chairman of the U.S. Atomic Energy Commission, tacitly referring to the incident, recommended the creation of a "Joint International High Energy Physicist Institute" in which both East and West participated equally. Salam took the suggestion seriously. That night, he discussed the idea with Marshak, Victor Weisskopf and Hans Bethe. They all agreed that the new entity could start as an "International Theoretical Institute under IAEA."[32] At this point, Salam's role was crucial. He initiated the idea and presented it where it could receive favorable action. As a Pakistani with a remarkable academic career at a British institution, he could mobilize the Third World delegations at the IAEA.

A month later, Salam took part in the IAEA's General Conference in Vienna and convinced the Pakistani delegation to present a resolution proposing the creation of the institute. In his address, he stressed the leading role of theoretical physics in the development of nuclear technology. "The basic notion that atomic energy can be released in the service of man was the brain child of two men: Bohr and Einstein," he told an audience primarily made up of politicians and diplomats. "The first nuclear reactor was assembled and actually constructed by a theoretical physicist—Enrico Fermi." He mentioned East-West collaboration and stressed the scientific backwardness of the developing countries. In his view, only the transfer of science, and in particular nuclear science, would open the possibility of the independent development of poorer nations. These arguments contained two assertions to which he would return: the linear model of science, technology and economic performance, and the claim that the Agency owed a debt to the community of theoretical physicists. He criticized the Agency's fellowship program as ineffective because the Members State had no information about the institutes to which the applicants would go, hence his proposal to centralize the program in a single institute under the control of the United Nations, where "these physicists can come as a matter of right at intervals on leave from their countries." Anticipating the criticism that such a center should need a laboratory, he differentiated be-

29. Gordon Feldman, and Abdus Salam, "Elementary particle interactions," *Physics today, 13:11* (1960), 74.

30. John Polkinghorne, *Rochester roundabout: The story of high energy physics* (Essex, 1989); Silvan Schweber, *QED and the men who made it: Dyson, Feynman, Schwinger and Tomonaga* (Princeton, 1994).

31. Michael Moravcsik, "High energy physics. An informal report of the Rochester Conference," *Physics today, 13:12* (1960), 20-25.

32. Salam to J.R. Oppenheimer, 21 Oct 1960, JRO, Box 40.

tween places like CERN, and Broookhaven, which "produce data," and a theoretical institute for interpreting and correlating the data. Although he presented his naive model precisely when a new form of organization, which assembled theoreticians, experimentalists and engineers, was emerging,[33] Pakistan, Afghanistan, the Federal Republic of Germany, Thailand and Turkey jointly presented his proposal. Salam's rhetoric and histrionics produced a great impact on the audience, especially among the delegates from developing countries. The resolution carried unanimously apart from eleven abstentions, including Canada and the United Kingdom (the U.S.S.R., U.S., Japan, France and India supported it). The Director General of the IAEA appointed a panel to consider the implementation of the proposal.[34]

In the meantime, Salam promoted the idea among the political elite of physics on both sides of the Atlantic. He asked Oppenheimer to write to McCone for "[y]our blessing may see this [sic] things through," and four days later, after the IAEA approved the resolution, to guide him about "the next steps to be taken." Oppenheimer replied that he would be attentive to the "status of the 'study.'"[35] On September 28, Salam wrote Amaldi asking for his support as president of the International Union of Pure and Applied Physics (IUPAP). Amaldi said that he would certainly support the initiative, but that unfortunately his mandate as President of IUPAP had ended the previous June.[36]

Trieste's candidacy

Amaldi was the most powerful physicist in post-World War II Italy. As president of the Istituto Nazionale di Fisica Nucleare (the highest authority in nuclear and particle physics), he had an overwhelming influence on the National Research Council (Consiglio Nazionale delle Ricerche, CNR). Everything regarding physics in the peninsula passed across his desk. He strongly believed in international collaboration as the only way for Italy to reconstruct its scientific community. He had been one of the architects in the creation of CERN.[37] Budinich was visiting Amaldi in Rome when Amaldi received the letter from Salam, that gave the ideal opportunity: "for us the banner of the United Nations would have been a blessing we did not even dare to dream of."[38] Budinich wrote to Salam offering accommodation in Trieste for the institute. Salam replied in a personal letter of thanks and

33. Peter Galison, *Image and logic. A material culture of microphysics* (Chicago, 1997).
34. IAEA, CC(IV)/RES/76, 6 Oct 1960.
35. Salam to J.R. Oppenheimer, 21 Oct 1960, JRO. Box 40.
36. Amaldi to Salam, 28 Sep and 12 Oct 1960, Box 246, folder 2/0, EAP.
37. Rafaella Simili, ed., *Ricerca e istituzioni in Italia* (Rome, 1998); Gianni Battimelli, ed., *L'Istituto Nazionale di Fisica Nucleare - Storia di una comunità di ricerca* (Rome, 2001); Edoardo Amaldi, *Da Via Panisperna all'America* (Rome, 1997); in Giovanni Battimelli and Giovanni Paoloni, eds., *Twentieth-century physics: Essays and recollections, a selection of historical writings by Edoardo Amaldi* (Singapore, 1995).
38. Paolo Budinich, "ICTP: Thirty years after," in A.M. Hamende, ed., *From a vision to a*

an official letter expressing his "deepest interest in seeing the Institute located in such a delightful place as Trieste."[39] The rector of the university Agostino Origone, authorized Budinich to proceed.

The Cassa di Risparmio di Trieste provided the financing for most of the public works and initiatives, including the university, in Trieste. Budinich called his friend, the professor of statistics Pierpaolo Luzzato Fegiz, who arranged for an appointment with the president of the Cassa, Guido Sardar. Sardar was skeptical. Nonetheless, by law, since, however, if the Centre came to Trieste, it would have to borrow from the Cassa, Sardar decided to invest in the idea donating 100,000,000 lire (an enormous figure) for Trieste's candidacy.[40] The problem had become political: Budinich now had to convince and mobilize the authorities in Trieste and Rome.

The local authorities did not require much persuasion. Establishing a United Nations institute would help win Trieste international prestige. The Christian Democrat Mayor, Mario Franzil, assembled a committee including President of the Province, the rector of the University, Cesare Merzagora (then Counselor of the Assicurazione Generali, and later Italian Senator), Prince Raimondo Torre e Tasso, a representative of the Cassa di Risparmio, and representatives of various local economic sectors, to persuade the authorities in Rome. On February 8, 1961, the mayor, the president of the Province, and the rector of the University wrote the Minister of Foreign Affairs, Antonio Segni (a few years later elected President of the Republic) to request the candidacy of Trieste as the home of Salam's institute.

The official candidacy had to be presented in Vienna at the meeting of the Board of Governors of the IAEA. Budinich approached Fegiz and Manlio Udina, professor of international law, who had good contacts at the Ministry of Foreign Affairs and at the Council of Ministers. The three professors visited Amintore Fanfani, the (Democratic-Christian) President of the Council, who gave his approval, and passed the order to the ministry to proceed. The diplomatic and political channels were well oiled; on March 14, 1961, less than six months after the resolution had passed in Vienna, Rome officially offered Trieste as the seat for the new center.

The 1961 Panel of Experts and the Fifth General Conference

A panel of experts convened in Vienna on March 21 and 22, 1961 to make recommendations about the establishment of the Centre.[41] The physicist Carlo Salvetti, director of the IAEA's Division of Research and Laboratories, acted as

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system. The International Centre for Theoretical Physics of Trieste (1964-1994) (Trieste, 1996), 26-37, on 28.

39. Salam to Budini, 14 Dec 1960, in Budinich, "ICTP: Thirty years after," Annex I.

40. Sezione Sviluppo e Studi, *Trieste e la sua Cassa di Risparmio dal 1942 al 1967* (Trieste, 1967); Luzzato Fegiz, *Lettere da Zadobaski. Ricordi di un Borghese Mitteleuropeo* (Trieste, 1984); Budinich (ref. 19), 59.

41. IAEA, SAC/36, 6 Apr 1961.

chairman. All members of the panel were theoretical physicists close to Salam and/or Budinich: Guido Beck (Brazil), Aage Bohr (Denmark), Satio Hayakawa (Japan), Leopold Infield (Poland), Nicolas Kemmer (U.K.), L.S. Kothari (India), Maurice Lèvy (France), Salam (Pakistan), Walter Thirring (Austria), Christian Møller (Nordita); Jacques Pretki (CERN); H. Roderick (UNESCO); Stefan Rozental (Nordita). Budinich attended as an observer. All of the advisors except Pretki and Kemmer (both collaborators of Salam) came from institutes that needed to enlarge their international contacts.

The panel unanimously supported the idea of the Centre on scientific as much as on political grounds. It stressed the necessity of fostering the "exchange of ideas" between the West and the East blocs as well as the importance of promoting research in the developing countries. The panel recommended that the Centre "should also be open to non-Member States of the Agency, as, for example, the People's Republic of China," and operate "on a truly international level without political polarization...[to] serve also to some extent the lessening of international tension." The Centre would be a "pilot project" for future international research institutes. In contrast to places where scientists came to "*meet only,*" the new institute would be a place of "*common work*," in "theoretical physics related to nuclear physics," from reactor theory to theoretical high-energy physics. The panel insisted that it should be "*strictly an advanced research institute for able physicists.*" Lectures on special subjects were desirable, but only to "foster 'cross-fertilization' of ideas."[42]

The panel specified six features that the host city should have: good access, pleasant living, a university with a good physics department, connections with other strong theoretical and experimental centers, and good experimental laboratories with easy access to computational facilities. Needless to say, Trieste did not fulfill most of these conditions. The panel also calculated the costs of the Centre. The conservative estimate for running costs, claimed to be accurate to 20%, came to half a million dollars in the first two years and less than a million in the next two. These recommendations went to the Agency's Scientific Advisory Committee (SAC) and then to the Board of Governors with SAC's comments. SAC suggested that the Centre's goals could be better achieved by providing additional fellowships at existing institutions and by arranging summer schools in various countries. The document urged the organization of one or two summer schools to test the response from the scientific community.[43]

The Board of Governors gathered in June to prepare IAEA's Fifth General Conference. After a difficult start in 1957 and a few years with very few effective actions, the Agency had to prepare to elect its second Director-General.[44] It was not a propitious moment to debate the expansion of the Agency. Nevertheless,

42. Ibid.
43. IAEA, GOV/INF/51, Annexes, May 1960.
44. David Fischer, *History of the International Atomic Energy Agency: The first forty years* (Vienna, 1997), 71-95.

with the support of Denmark, Austria, Italy, Sweden, Yugoslavia, and many developing countries, the Conference approved a resolution requesting that the director general circulate among the Member States a report on the panel's study and SAC's comments, and to inquire whether they would support and provide facilities for the Centre. An Italian offer of U.S. $1,000,000 for the required infrastructure plus a U.S. $32,000 annual contribution towards the costs of running the Centre was included as an annex.[45]

Perhaps more importantly for the ICTP's future was the election of the Swedish physicist Sigvard Eklund as second Director General. His appointment meant the beginning of a new era for the Agency; as the Chairman of the Conference wrote in retrospect, "after four years of mostly preparatory work, the organization was readying itself for action."[46] Eklund, who had participated in the Geneva conference of 1958 (where he and Salam collaborated), thought that the Agency should emphasize its technical and scientific support, especially to the developing countries.

First inquiries about the proposal

In March 1962, Eklund circulated a questionnaire among the Member States. In the cover letter he announced that the Agency would help the Government of Italy hold a seminar on theoretical physics in Trieste from July 16 to August 25, to obtain "useful guidance regarding the further steps to be taken for the establishment of an international center for theoretical physics on the lines envisaged by the General Conference."[47] Very few countries replied. Everyone saw that the creation of a center under the banner of the IAEA would have political consequences for the future of the Agency and the balance of power within it. As the idea of the Centre began to crystallize, the prudence of most delegates from both the Eastern and Western blocs turned into hostility. The United States said that it was "unable at this time to provide the information requested" but that it would be prepared to discuss the question at the Board of Governors. The Soviets made no declarations at all. The French government expressed its surprise at Eklund's letter "because we thought that the setting up of such a center in the near future is not very likely since the American and Soviet members of the Scientific Committee did not feel that such an undertaking would be possible at the present time." Norway took a negative attitude too, though on different grounds: fundamental studies in theoretical physics did not lie within the scope of the IAEA. This debatable argument was used on several occasions by different delegations opposing to the ICTP.[48]

45. IAEA, GC(V)/RES/107, 6 Oct 1961.
46. Oscar A. Quihillalt, "The Fifth General Conference of the IAEA," in David Fischer, ed., *The International Atomic Energy Agency: Personal reflections* (Vienna, 1997), 53-61, on 56.
47. Eklund to IAEA's Member States (SC/331), 21 Mar 1962, Box 28, Folder 3, IRP.
48. Eklund to I.I. Rabi, 25 May 1962, Box 28, Folder 3, IRP.

Three countries, the poorest and least scientifically advanced ones which offered to contribute, were enthusiastic about the idea. Greece said that it would send professors and share the running costs of the Centre, Pakistan that it would substantially increase its voluntary contribution to the Agency towards the creation of the Centre. The Guatemalan government "approv[ed] with pleasure the establishment of an International Centre for Theoretical Physics with the location in Trieste."[49] Meanwhile Budinich continued to line up political support in Italy, notably the Ministry of Defense, Giulio Andreotti.[50] The Council backed the project. In 1961, Egidio Ortona returned from the Italian Embassy in the United States to become Director General of Economics at the Ministry of Foreign Affairs and Luzzato Fegiz was appointed professor at the University of Rome.[51] In Rome, he could more easily lobby politicians like Fanfani, professor of economic history at the Rome university, and Ortona, who took a keen interest in bringing the Centre to Trieste. During the 1950s Ortona had acted as an intermediary between a delegation of Italian physicists, which included Carlo Salvetti and Edoardo Amaldi, and the United States Atomic Energy Commission in furtherance of the program Atoms for Peace. In addition, Ortona had taken part in the diplomatic negotiations for the acceptance of Italy as part of the United Nations and showed a special interest for new nations aligned with the West, particularly Pakistan and Iran.[52] These previous involvements help explain his active interest in the ICTP. During his tenure at the Ministry he played a key role in the commitment of funds for the Centre. In 1962 Italy replied to the IAEA's Director General letter confirming an offer of over one million U.S. dollars for the new center.

A slick brochure was printed featuring the beauties of Trieste, accounts of its cultural life, diagrams of future motorways, maps of the airports "within easy reach," plans for the Centre drawn up by two architecture professors at the University, and diagrams of the four sites offered to host the Centre. The Province offered "Le Ginestre" between Monfalcone and Trieste; the city, two sites near Trieste; and Prince Torre e Tasso, a place near Duino. One of the city's sites, in Miramare Park, was preferred, perhaps to help develop the tourist industry with the little port of Grignano, next to Miramare, as a strategic center. Luzzato Fegiz among others had stressed the importance of turning the city into an attractive tourist destination to realize its internationalist ambitions. An unrealized development plan had highlighted the seaside between Sistina and Miramare.[53]

Meanwhile, Denmark had expressed its interest in having the Centre in Copenhagen. Considering the strong tradition of Copenhagen in theoretical physics, the then-recent setting up of Risø's Research Establishment, the efficient scientific

49. Ibid.
50. Guido Gerin, interview by author, Summer 1999.
51. Luzzato Fegiz (ref. 40), 405-414.
52. Ortona, *Anni d'America: La diplomazia, 1953-1961* (Bologna, 1986),135-142, 420. While at the Ministry in Rome, Ortona supported the project for the European Space Agency project (E. Ortona to Amaldi, 5 May 1963, Box 231, folder 2/0, EAP).
53. Luzzato Fegiz (ref. 40), 376-377.

documentation service rendered by the University, and the electronic computer operating at the Danish Institute of Computing Machinery (and extensively used by the Bohr Institute), Copenhagen became a serious competitor. In addition, the Danish authorities, following the estimate made by the panel, offered $800,000 in U.S. dollars.[54]

Nevertheless, the scale of the project made the Danes hesitate. They urged Eklund to consider the new center as a "modest" institute tightly connected to an existing one (the Copenhagen Institute for Theoretical Physics). Norway made a similar suggestion in favor of NORDITA.[55] Both suggestions went against the proposal, which stressed the "international" and "neutral" character of the center. From a scientific viewpoint the Centre would have been better located in Copenhagen, but the geopolitics of Trieste, rather than the scientific considerations of Scandinavia governed ICTP's prehistory.

Two additional offers were made, one each from Turkey and Pakistan. Neither could compete with the prestige and financial base of the European countries. Furthermore, Salam thought that the Centre should be located, at least in its early years, in a "central" location, that is, in Europe. It was better to be located in a peripheral city in the "metropolis" than in a metropolis on the "periphery." The Pakistani proposition may have been a move to raise the European offers.

Following up SAC's recommendation, Eklund inquired of several major institutions whether they would receive scientists from the Third World sponsored by the IAEA. CERN responded that it "would hardly be able to contribute," Oppenheimer that "we [at Princeton] would be glad to receive nominations, recommendations, and information about any candidates who might reasonably come here."[56]

The Trieste Summer School and the Sixth General Conference

IAEA's Board of Governors again studied the question in June 1962. The Director General submitted the results of a questionnaire to the Member States, the report of the 1961 panel, and SAC's views. The Board determined that the financial assistance had to come from the interested Member States and not from the Agency's regular budget, and inclined to give preference to an international center to be built in Trieste.

Eklund, Salam, and Budinich thought that the summer school should be used as a step towards the realization of the Centre. They thus turned the proposal of holding summer schools in Trieste and Czechoslovakia, which the SAC had put forward to demonstrate that a new center was unnecessary, and on its head. In May, the IAEA Deputy Director, John Hall visited Trieste. He reported to Isidor

54. Eklund to Rabi, 25 May 1962, Box 28, Folder 3, IRP.
55. Ibid.
56. Letter from CERN quoted in Sir William Penney's report "International Theoretical Physics Centre," Jan 1963], Box 28, Folder 4, IRP; Oppenheimer to Eklund, 27 Aug 1962, JRO, Box 40.

Rabi, a member of SAC, that "it is a very attractive location and the people whom I met were very enthusiastic about developing Trieste on a continuing basis as an international site." In what seems to have been an attempt to ease Rabi's opposition, Hall added: "As you know, your friend Professor Cacciapuoti is Professor of Physics at the Physics Institute of Trieste."[57] Budinich convinced the General Commissioner of the National Government (the representative of Rome in Trieste), whose relations with the local authorities were traditionally tense, to pay to adapt the Castelletto in Miramare Park to host the meeting. On July 16, the symposium opened. Three days later, Mayor Franzil, on behalf of the City of Trieste, conferred a medal on Eklund.[58]

Some of the most prominent names in theoretical particle physics, including Eugene Wigner and Nobel Laureate Julian Schwinger, attended the school. Argentinean Juan José Giambiagi, a friend of Salam's recalls that "the dominant topic was actually the proposal of Abdus Salam and Paolo Budinich to create an international center for the benefit of the developing countries. The seminar was in fact a kind of pilot experiment for testing the feasibility of a center."[59] At the end of the school, Budinich and Salam asked the participants to write a letter supporting the creation of a center in Trieste and agreeing to visit it regularly.

Given the divided opinions at the Board of Governors, the advocates of the Centre decided to wait until the General Conference in September (after the Trieste Seminar), trusting in the support of the developing countries (the new majority). In a joint paper, the Board of Governors and the Director General informed the Members that the Board was considering implementing most of the recommendations of the Scientific Advisory Committee.[60] During the Conference, Eklund circulated the letter of support from the participants of the Trieste Seminar and copies of the replies from the institutions he had contacted in August. Thus the Conference had to choose among SAC, France, Norway, and other countries, who opposed the establishment of the Centre, the Soviet Union, the United States and the United Kingdom, who were unenthusiastic, if not hostile to it; and the forces and physicists lined up by Salam and Budinich.

Salam gave an eloquent address to the General Conference. It brought the delegates from most of the developing countries to support a new resolution in favor of the Centre. In a masterpiece of rhetoric, Salam asked three questions: "(1) Does research in theoretical physics fall within the scope of the Agency's activities?; (2) Do physicists from the emerging countries really need and desire such a Centre? (3) If the Centre is desirable, can it be created and can the Agency afford it?"

57. J. Hall to Rabi, 18 May 1962, Box 28, Folder 3, IRP.
58. "Attività del Consiglio Comunale nel mese di luglio 1962," *Rivista della Cittá di Trieste*, Aug-Oct, 1962, 17.
59. J.J. Giambiagi, "Memories from ICTP," in *From a vision to a system. The International Centre for Theoretical Physics of Trieste (1964-1994)*, ed. André Hamende (Trieste, 1996), 219-225 , on 220.
60. IAEA, GC/(VI)/194, Sep 1962.

Making reference to the first question he pointed out the supposed inherent relation between theoretical physics and nuclear technology: "I sometimes wonder what reply an Agency like ours may have given to a request of a young and unknown theoretical physicist, Albert Einstein, in 1904, if he had made an application for a Fellowship to follow his theoretical speculations on the nature of space and time," he said. He contended that theoretical physics did not need costly apparatus and hence was inexpensive. Finally, with admirable political sense, he referred to the rights of young scientists from poor countries: "let us not forget that young scientists in the under-developed world feel the urge to meet the challenges of fundamental science as much as anyone else." In this context, the word "challenge" has a strong political meaning: denying opportunity to do theoretical physics at the highest standards constituted an insult to, and a waste of the intelligence of, the underdeveloped nations. As for the second question, Salam showed the letter signed in Trieste by 53 of the participants and mentioned other physicists whom he knew that "from my personal impressions" (including Niels Bohr and Hideki Yukawa), to be "strongly in favour of an International Centre." In Salam's view the project was feasible because it counted on the blessing of the physics elite.[61]

Salam polarized the audience by presenting the case as a confrontation between poor countries in need of science and technology and rich countries possessing the key of development. He was acclaimed by the developing countries' delegations. He had touched their internationalist hopes. The other delegations looked perplexed and felt uncomfortable, it seemed to them that Salam had manipulated the developing countries' ignorance and naivety about science and technology. A year later when the negotiations ended, Rabi commented with similar arrogance: "you wanted to have a centre for underdeveloped countries: it will be an underdeveloped centre."[62] And further in a letter to Oppenheimer:[63]

> The great surprise in a way was the terrific head of steam which Salam was able to raise...for a scheme for a rather large center of theoretical physics. Delegations which had no idea what it was all about lined up passionately in favor and we had the encouraging spectacle of the Eastern bloc and the Western bloc being on the same side…about to be bowled over by the hepped up underdeveloped…The Trieste meeting must have been most extraordinary….
>
> Salam's skilful leadership in mustering the strength of the have-nots was truly astonishing.
>
> I have never seen the most skilled professional gather in his votes more effectively. He is clearly a man who will go for [sic] in politics or in the politics of science. I am writing all this because I have such a feeling of inadequacy in presenting our case at home compared with the natural genius of a Salam.

61. Abdus Salam, *Ideals and realities. Selected essays of Abdus Salam.* ed. C.H Lai and A. Kindwai (3rd edn., Singapore, 1989), 219-223.
62. Budinich (ref. 38), 30; Budinich, interview by author 1998/9.
63. Rabi to Oppenheimer, 25 Sep [1962], JRO, Box 59.

A few days later, Oppenheimer received a letter from Salam reporting the "strong demand from the smaller countries of South America and Asia," and the lack of interest shown by the U.S., U.S.S.R. and the U.K. The letter closes with Salam's characteristic way of presenting his own proposal as a project of his interlocutor: "I do very much hope through your continued interest the Centre comes to existence as early as possible and justifies all the hopes which have been built up on the idea of truly international collaboration in our subject."[64]

Finally, the Conference approved a new resolution recommending that the Board of Governors study "ways and means" for setting up the Centre. If the study showed its feasibility the Centre should be included in the Agency's programme as early as possible. It was a compromise. The new study might have concluded against the Centre. No doubt, however, the unusual alliance between Italy and the Third World won a battle against the even more unusual coalition of the United States, most Western European countries and the Socialist Bloc.[65] A final decision would be made the following year.

Penney's report

The IAEA's SAC discussed in depth the establishment of the ICTP in May 1961, June 1962, October 1962, and again in February 1963. Throughout this period, the unanimous hostility of its members remained unaltered. During the October meeting, for instance, they reported that "In the view of the limited resources available to the Agency, every effort should be made to avoid duplication with national programmes."[66] It decided that because the General Conference of 1962 had rejected its views, it would "fully explain in writing their considerations about the advantages and disadvantages of the proposal." Sir William Penney, who in 1962 replaced Sir John Crockcroft as scientific advisor to the British Atomic Energy Authority, agreed to draw up their arguments.[67]

"For the present [Penney's report ran] there were more effective and more economical methods by which [Salam's] objectives may be achieved." For one the SAC pointed out that high-energy theoretical physics "has perhaps no immediate practical application in the direction of improving the living standards" of poor countries. Other areas such as fluid mechanics, solid state theories, gas theory, logical use of computers and so forth, would be "less distant from practical application" and, therefore, more useful in that part of the world. The SAC did not mean, as has been alleged, that the developing countries should not carry out any research at all. It contended that these countries should do research bearing in

64. Salam to Oppenheimer, 28 Sep 1962, JRO, Box 40.
65. Resolution GC(VI)/RES/132, of 26 Sep 1962, was approved by 57 votes in favor and 4 abstensions.
66. IAEA, SAC/OR.9, 28 Jan 1963, 8.
67. Penney' report is enclosed in a letter from H. Seligman to I.I. Rabi, 16 Jan 1963, Box 28, Folder 4, IRP. All quotations in this section are taken from this report, unless indicated otherwise.

mind the basic needs of their societies. It believed that developments in theoretical physics and applied science could be secured only through scientific programs on a wide and substantial basis. Therefore it proposed that the IAEA should limit its own involvement but "*encourage* the growth of theoretical physics on a wide basis *in* newly-developing countries."[68]

The SAC further objected that Salam's representation of the Trieste Summer School of 1962 had been misleading. Scientists, especially leading scientists, would not leave their institutions for a year or more to work elsewhere. At best, that might happen in the early years, when some scientists would be "sympathetic to encouraging research in the developing countries." As time passed, the quality of the institute would deteriorate owing to the lack of interest of the leading scientists. According to this patronizing argument, the Centre would never be attractive for its intellectual merits, but would remain a charitable institution for poorer countries, "artificially" supplied with a constant flow of external theorists. This objection reflected the Committee's skepticism towards an institution not closely tied to a national program, and budget. Hence the SAC had proposed to hold summer schools in different parts of the world. Although scientists would not return to the same place every year, they might support a summer school that gave them "the opportunity of visiting different parts of the world."

Finally, the SAC objected that the Centre would be too costly. Quite apart from the costs of the building and library, the necessary equipment included a U.S. $1 million dollar computer considered by the SAC to be "essential." Theoretical models entailed long calculations where a computer seemed necessary. A physics center without such a facility would not be competitive. This necessity became apparent in the early 1960s.[69] SAC estimated that the costs of setting up the Centre would run between 2.1 and 2.25 million dollars; general expenses would run an additional U.S. $800,000. Taking into account Italy's offer ($1 million, plus $250,000 per year, in U.S. currency), the IAEA would have to find the remaining $1.2 million for capital costs plus $550,000 per year. These amounts represented about 17% of the IAEA's budget for the initial infrastructure plus 8% of its annual budget.[70] Since the Centre would host no more than 80 theoreticians, the cost seemed disproportionate. The committee suggested that, instead of creating a Centre, the Agency should intensify its fellowships program made available to Third World students to study in existing research centers, and pointed to the "encouraging" answers from Dubna and Princeton to the Director-General's questionnaire.

In February 1963, the Committee gathered again and submitted Penney's report practically without modification to the Director General. It began, "The Committee…unanimously feels on scientific grounds that the Agency should not

68. Penney (ibid.), italics added.
69. Galison (ref. 33).
70. United States Department of State, "Seventh General Conference [of the] International Atomic Energy Agency, Vienna, September 1963. Position Paper, Program and Budget for 1964," NARA, DoS Rec., Rg. 59, Box 4154, file AE-IACE (1963).

take responsibility for, or encourage, the establishment of such an institute under the Agency."[71] In summary, it insisted that summer schools and more fellowships would be more effective ways to respond to the demand from the developing countries. SAC was determined to stop the project. In the fall of 1962, just before the General Conference met, the Indian physicist Homi Bhabha, a member of SAC, suggested bringing the question to IUPAP, of which he was President.

The crucial year: 1963

As soon as Carlo Salvetti, now the Italian representative to the IAEA's Board of Governors, learned about Bhabha's intention, he urged Amaldi to "move the idea of the Centre and in particular the candidacy of Trieste when the item is presented [to IUPAP]." During SAC's October meeting in 1962, Salvetti had the opportunity to discuss the matter in private with several influential physicists.[72] At this point, the promotion of the Centre fell entirely on the Italians and Alexandre Sanielevici, a Romanian experimental physicist trained in Turin and Deputy Director of the IAEA's Division of Research and Laboratories.[73] On January 28, 1963, Budinich wrote to Salam saying that he expected Salam to accept the Directorship of the Centre. He reported that Sanielevici was visiting Trieste "in order to start the machine for the creation of the Centre, site, building and so on." And he added: "You should come to Trieste as soon as you can, you will be received as a Roman Emperor."[74] This letter reveals how far the Trieste group was working independently of Salam. Indeed, the letter expresses that Budinich fears that Salam might not come to Trieste after the Centre's foundation, and confirms the leading role of Trieste in the negotiations. Before 1964, it was not clear whether Salam would take over the directorship of the Centre. As Sanielievici wrote Budini in February 1964, "in spite of his promises, Salam did not send us back his written acceptance of the post of Director."[75]

Amaldi did not participate in the IUPAP meeting in Bombay and therefore could not defend the ICTP there, but forwarded Budinich's counter-arguments to SAC's objections to all members of the Executive Committee.[76] Amaldi could not prevent IUPAP from agreeing with SAC: the Centre was inconvenient. In Italy he worked actively and carefully to obtain the necessary political and economic support. The Centre did not compete with other projects within the research budget. The Ministry of Foreign Affairs had to make a special provision for it; he was careful not to commit funds already approved for national programs. In other words, Amaldi

71. IAEA, "Conclusions reached by the Scientific Advisory Committee at its Tenth Meeting on 8 and 9 Feb 1963 in Geneva," Box 28, Folder 8, IRP.
72. C. Salvetti to E. Amaldi, 16-Oct-62, Box 504, folder 2, EAP.
73. Stasi (ref. 18), 208.
74. Budini to Salam, 28 Jan 1963, D.138, ASP.
75. Sanielevici to Budini, 7 Feb 1964, D.138, ASP.
76. Budini to Amaldi, 10 Nov 1962, Box 504, folder 2, EAP.

supported Budinich's initiative, but remained reluctant to redirect funds approved for existing programs. In January 1963, Amaldi replied to Budinich's request of 150,000,000 lire from the INFN to the Centre: in 1961 the Institute had decided to make a contribution of 20,000,000 lire for scholarships and did not intend to make further provision.[77] At any rate, in the Spring of 1963 Italy confirmed the offer made a year earlier. In addition to financial support, the government announced the creation of two chairs for full professors and four for assistant professors in theoretical physics at the University of Trieste.

In February, the Board of Governors, now chaired by Salam's intimate collaborator, the Pakistan Governor Ishrat H. Usmani, requested that the Director General convene a meeting of up to three advisers to study the offers of facilities, assistance and cooperation made to the Agency for the establishment of the Centre.[78] We have no details of the criteria used to select the members. Nevertheless, the "three wise men" chosen, Robert Marshak, Jaime Tiomno and Leon Van Hove were certainly not neutral arbiters. Marshak championed international exchange. Jaime Tiomno, badly needing international contacts, had spent some time as Salam's guest at Imperial College in 1961. Leon Van Hove was the director of the theoretical division of the largest international center in the Europe (CERN).

The panel met in April and, despite SAC's arguments, "it came to see such great potentialities in the project of establishing an International Centre for Theoretical Physics that [they] feel this enterprise to deserve the greatest and most enthusiastic support." Implicitly referring to the Copenhagen spirit of the 1930s, they called for the creation of "an atmosphere of informality and free discussion." As for the computer, the panel pointed out that 20 to 30 hours of computing per week, amounting to about $100,000 at the end of the fifth year, might be sufficient. It expressed the hope that the Director General would raise additional support from philanthropic foundations on the basis of the scientific prestige of the staff. As for the location, the panel made a choice between Copenhagen and Trieste: "Copenhagen would be a more favourable location than Trieste from the point of view of existing theoretical environment whereas Trieste would be favoured on the basis of the financial commitment."[79]

However important the Panel's backing, the project still had several important enemies. The most important of these was the Soviet Union, which still smarted over the election of Eklund against its opposition. The arguments against Eklund had been championed by Vassily Emelyanov, another member of the SAC. Soviet opposition to the Centre resulted from their disinterest in sponsoring an institute

77. Amaldi to Budini, 10 Jan 1963, Box 286, folder 2/0, EAP.

78. The draft resolution was submitted by Greece (IAEA, GOV/874, 21 Feb 1963) and amended by the United States to weaken the commitment of the Agency to the proposed center by transferring responsibility to the individual Member States (IAEA, GOV/875, 22 Feb 1963).

79. IAEA, "The International Centre for Research in Theoretical Physics. Report to the Director General by Messrs. Marshak, Tiomno and Van Hove," Gov/INF/98, 21 May 1963.

located in Western Europe and backed by a Director General they considered aligned with the NATO countries.[80] Equally important, the U.S.S.R. did not want intermediaries in negotiation with the Americans. The British and the French delegations also made clear their opposition from the beginning. Neither country needed to reenforce its international contacts in theoretical physics. They saw no advantages to setting up the center, and internationalist ideology played very little in their foreign policy. As Bertrand Goldschmidt told Salvetti, it would be different if Italy paid most of the expenses. The French and British research institutes, financed by the national budgets, already had streams of eminent visitors: Cambridge, Oxford, Imperial College, London, and the summer school of Les Hauches, sponsored by NATO precisely to put French students in contact with leading theoreticians from the rest of the industrialized world. In contrast to the defeated countries of World War II—Italy, Japan and the Federal Republic of Germany, which embraced the ICTP idea from the beginning—France and Britain could offer nuclear capabilities such as advisory services and equipment to several countries. For these countries, bilateral collaboration was politically and economically more attractive than an international center. Links with the developing world did not pass through the United Nations system, but through post-colonial networks coordinated through national institutions.

India was the only Third World country that opposed the ICTP. Fearing that the Americans would support the enterprise, the Indian delegation elaborated an extensive memo, written by Surjit Mansigh, a notorious exponent of the realist school of international relations in Indian diplomacy. The Indian delegation was determined to stop so grand a project proposed by the Pakistani delegation. The opposition of the delegation with the largest scientific community in the developing world carried special weight. The Indians put it bluntly: "an institute of this nature would not be of benefit to the developing countries." Its arguments reproduced the SAC's. Also like the SAC it proposed summer schools and fellowships. It pointed out the expressed opposition by the members of SAC and IUPAP (including Bhabha, a member of both). "The Government of India, therefore, hopes that the Government of the United States of America will give careful consideration to the views of these scientific bodies [SAC and IUPAP] and support their recommendations."[81]

After a heated discussion, on June 14, 1963 the Board of Governors, decided to approve, provisionally, an International Centre for Theoretical Physics at Trieste. The Director General was requested to submit a draft of an agreement for acceptance at the next General Conference.[82] Budinich, Salam, Usmani, Salvetti, Fausto Marinucci (the Italian Ambassador to Vienna) and Eklund had won. Italy and the Agency had committed to the creation of the Centre. Now their respective contributions to the undertaking had to be decided. It was a political and diplomatic

80. See Oscar Quihillalt (ref. 46), 57-60.
81. "Aide Memoire, delivered to D. Schneider by Surjit Mansingh of Indian Embassy on June 12 1963," NARA, DoS Rec., Rg. 59, Box 4156, AE-IACE (1963).
82. IAEA, GOV/DEC/31(VI), decision number (63), 14 June 1963.

triumph for Trieste. Budinich sent telegrams to Amaldi and to the ad hoc city committee thanking them for their support and underlining the crucial role of the national governmental diplomats Marinucci and Salvetti.[83]

The following day, Budinich was received at the train station by his colleagues, his father, and the local press. He lost no time in declaring the next step: "It is necessary to provide immediately for the indispensable works for the Centre's functioning: the Ronchi airport, the Venice-Udine highway and a double track railway system between Trieste and Venice. This is a commitment we will need to face in the quickest and most rational way."[84]

Limiting the IAEA's participation

The report of the three wise men balanced the power relations between the Centre's advocates and the opponents. It neutralized SAC's opposition. Now each side had the backing of an authoritative body of experts. The question had to be settled democratically at the General Conference. This left two options for the opposition: either put strict constraints on the participation of the Agency in the undertaking or stop the whole project by gathering enough votes at the General Conference. The United States adopted the first position, India the second.

The United States realized that the report of the wise men left little margin for opposing the creation of the Centre. The State Department instructed its delegation in Vienna to say that the United States did not "plan to match special contributions such as those for the Theoretical Physics Centre or the Oceanographic Research Project [in Monaco], since the United States matching formula is intended to encourage contributions for the support of the regular operational program, whereas special contributions are made for special projects which are of particular interest to the donor country and are outside the target supported by all other voluntary contributions."[85]

The United States systematically opposed any attempt at including the ICTP in the IAEA's regular budget. Consequently, and throughout its history, the future of the Centre depended on the periodic renewal of a special agreement between the Agency and the Italian government.

Item number 13 of the General Conference of 1963 concerned "the establishment under the auspices of the Agency of an International Centre for research in Theoretical Physics." As in the previous year, the pressure of the new majority representing the recently independent countries forced both the United States and its allies, as well as the U.S.S.R. and the Socialist bloc, to accept the creation of the Centre. Instead of overtly opposing the resolution, most industrialized countries decided to abstain. Hence there was no formal opposition. However, the United

83. Budini to Amaldi, 14 June 1963, Box 504, folder 2, EAP.
84. Anon., "Il Centro reclama aeroporto e autostrada," *Il Piccolo* (15 June 1963), 4.
85. United States Department of State (ref. 70).

States campaigned to limit IAEA's contribution to an amount "not exceeding U.S. $55,000" in the form of fellowships, and, during the first four years, to a total of U.S. $110,000. A confidential report of the U.S. reads: "The Board…approved the establishment of the Centre, on a provisional basis and subject to some fairly stringent restrictions regarding the Agency's financial commitments. The U.S. was a principal architect of this decision, and as the principal contributor to the Agency's voluntary budget, our objective was clearly to limit the Agency's financial commitment."[86]

4. EFFECTIVE NETWORKS AND PROPITIOUS ENVIRONMENTS

"I must say that very rarely were so many difficulties sorted out so quickly....Once again science has survived, has surpassed politics to show the direction that conduces to the progress and fraternity among men."[87] Despite this rhetoric from the address given by Carlo Arnaudi, Minister for Scientific and Technological Research, at the inauguration of the ICTP in Trieste, the creation of the ICTP does not represent the victory of science over politics, but, rather, the efficiency of an intimate collaboration between physicists and politicians in a propitious political environment. Despite having different motivations and interests, the political circumstances provided the conditions for the crystallization of their common effort. The local, national, and international political and scientific networks to which Salam and Budinich had access were decisive in advancing the idea of the ICTP against the hostility of the Scientific Advisory Committee of the IAEA and the American and Soviet delegations. This network included the Trieste authorities and intellectual elite, the Italian and Pakistani diplomatic services, and some influential members of the scientific elite in the United States and Europe.

Trieste

The ICTP belongs among the initiatives to bring Trieste out from its isolation. The initiatives included the *Umana* group, Cacciapuoti's involvement with UNESCO, the "European network" in which Budinich collaborated, and later the European University. In the minds of some promoters, the new facilities necessary for the ICTP would convert Trieste into an Italian Geneva. When the Centre was approved, Budinich and Arrigo Cavalieri (then director of the Italian-American Association in Trieste) founded a school for the children of the scientists (a condition stipulated by the Agency). They used the existing International School in Geneva as a model and quoted from an argument that had been used in Switzerland: "American and other firms which had decided to establish branches in

86. John Trevithick [?] to Herman Pollock, 30 Jul 1965, attached to H. Pollock to J. Slater, 9 Aug 1965, in grant-file 67-40, FFA.
87. Carlo Arnaudi, Istituto di Fisica Teorica dell'Università degli Studi di Trieste, *Il Centro Internazionale di Fisica Teorica*, booklet, undated [but 1964].

Europe…based their choice of Geneva as their European headquarters on the presence of the International School."[88]

Many envisaged the Centre as a means of neutralizing the political polarization in Trieste. The local intelligentsia, represented in the *Umana* group, believed that cultural exchange with the Socialist countries could ease political tensions. Their policy was favored by better relations between the United States and the Soviet Union after Stalin's death. For the first time, a Soviet leader visited the Pope. In 1962, Italy elected a center-left government and the socialists took over some key ministries.[89] Meanwhile Trieste continued a polarized life. Not only intellectuals, but also moderate politicians believed that a center with an active scientific collaboration between the two blocs would help to isolate the most extreme factions. The Centre could show that a dialogue between members of antagonistic ideologies and systems was possible and mutually beneficial.

The ICTP offered a way to force Rome to be more generous toward Trieste. If Rome signed an agreement with the IAEA to set up an international center in Trieste, central government would have to provide the necessary infrastructure. The economic benefit for the local building industry and commercial sector would pay significant political dividends to the local authorities. It is difficult to assess the weight of the ICTP in the decision to build a new highway linking Trieste, Miramare and Monfalcone, in the duplication of the Trieste-Venice railway track, and in the transformation of Ronchi into a commercial airport. However, the government frequently invoked the Centre to justify these works. The investments in infrastructure went to local industries and local services. The seat in Miramare belongs to the University, which rents it for a symbolic price to the United Nations. Even if the ICTP had failed, the infrastructure would have been useful to the city.

Trieste's peculiar geopolitical situation after its incorporation into Italy encouraged the emergence of a special group of people with experience in diplomatic negotiations. Most of people who lobbied in Rome for the ICTP, had been involved in negotiations defending the interests of Trieste during the hard years after World War II. This group included a high proportion of professors from the University of Trieste. Budinch, Udina, Luzzato Fegiz, Gerin and others, all had had experience in the international arena and had excellent contacts with the Foreign Affairs Ministry. Budinich and his allies in Trieste and Rome avoided intermediaries, a lesson they had learned from living in bureaucratic Italian academia. Had Budinich followed the regular process, he would have had to pass through the dean of the Faculty, the Council of the Faculty, the Senate House, the City Council, the Rector and so on.[90] Although the City Council knew about the initiative, it never debated the question in any detail. The decision to create the Centre in Trieste

88. "Relazione sull'Attività del Comitato Cittadino Ristretto, dal 26 Giugno 1963 al 12 Ottobre 1965, Annex F," D.147, ASP.
89. Ginsborg (ref. 16), chapt. 8.; Botteri et al. (ref. 16).
90. Budinich, interview by the author, 1998/9.

was made by Budinich, "who was considered the expert,"[91] with the approval of the executive, the assistance of an ad hoc committee and the complacency of the City Council.[92] They all agreed that the Centre was an unquestionably good thing.

Italy

The government and the Christian Democrat Party advanced Trieste's candidacy for three reasons. First, Italy had an interest in pursuing a nuclear policy for industrial purposes. Contacts between Italian science administrators and Western nuclear powers, particularly the United States, concerning the peaceful uses of atomic energies date from the mid-1950s. The "Ippolito affair" (1964-68), which involved charges of corruption against a top science administrator from the INFN (Felice Ippolito), cast a shadow on the nuclear alternative. However, in the early 1960s, while the fate of the Centre hung in the balance, the government and the ruling Christian Democrat Party (now allied with the Socialists) believed in the feasibility of nuclear power and thought that the internationalization of Italian science was crucial to it. During the negotiations, the Trieste newspapers presented the ICTP as a "nuclear theoretical centre" and an "atomic centre," ambiguous terms that neither the physicists, nor the politicians tried to clarify.[93]

The second reason was Italy's interest in cultivating good relationships with Third World diplomats and politicians. These relations could play a crucial part not only in diplomatic terms (in multinational forums such as the United Nations), but also economically and commercially. Italy wanted to become a "donor" country for symbolic and psychological as well as political and economic reasons. Offering technical and scientific aid, Italy would be identified as a member of the "developed" world.[94] The maneuver proved to be more useful for Italy than initially imagined. Many years later, when the Italian physicist Antonino Zichichi (referring to Budinich's and Salam's request) convinced then-president of the Council of Ministers, Giulio Andreotti, to visit the ICTP. Andreotti explained to his Minister of Foreign Affairs why the ICTP was worth supporting:[95]

91. Gerin (ref. 50).
92. In the records of the City Hall from 1960 to 1964, I could not find any debate about the Trieste candidacy, except the brief reports by the Mayor about the actions taken by the ad hoc committee; see *Rivista della Città di Trieste.* The verbal records between 1954 and 1964 are missing in the City Archives.
93. For example, "Trieste è prevalsa nella scelta per il Centro di fisica nucleare," *Il Piccolo* (15 June 1963), 5; "Il Centro di Fisica nucleare entra in fase di realizzazione," *Il Piccolo* (29 June 1963), 5; In an interview published in the local newspaper, Sanielevici commented: "The Centre will be devoted to research in theoretical physics in connection to applied problems in peaceful uses of nuclear energy." "Presto il Centro atomico senza attendere la sede," *Il Piccolo*, 28 June 1963, 4.
94. Egidio Ortona, *L'Africa e le nazione unite,* in Centro Italia Africa, *Cuaderno, 5*, and "Le 'tensioni' dei paesi sottosviluppati," *Moneta e credito, 15:58* (1962), 230-251.
95. Quoted by Budinich (ref. 19), 85.

> The ICTP of Trieste is a good investment for Italy. First because we are committing the Funds for Development, that, by law, we have to spend anyway in the Third World. These funds are called multilateral, while, in fact, they are bilateral, because the beneficiary countries know that they come from Italy. Second because scientific assistance is the kind of help these countries want. Third, because a great deal of the funds are invested in Trieste.

These interests would not have created the Centre if conditions in Italy had not favored science and technology. Italian scientists and science administrators believed that Italian science badly needed international support to revive it. The critical phase of the renewal process ended in 1954. In Amaldi's words, "a new phase was beginning in Italy, nay in Europe, not only for the study of fundamental physics, but for all branches of research."[96] In the 1960s, Italian physicists felt that Italy still lagged behind its European partners, and regarded CERN as their most important point of reference and support. Some of them had the illusion that the ICTP would become a theoretical CERN.

The relation that emerged during these years between science, technology, the political parties, and the state was the most important national factor favoring the creation of the ICTP. To attract the scientific intellectuals, the Christian Democrat Party sponsored several initiatives that developed parallel with the negotiations over the ICTP. On December 2 and 3, 1961, the Central Office of Cultural Activities of the Christian Democratic Party held a national meeting concerned with "A policy for scientific research" in Rome.[97] Attilio Piccioni, then vice-president of the Council of Ministers and president of the National Council of the Christian Democrat Party, gave the opening speech in which he stressed awareness of the interests of scientists. The Party had to have "sensitive antennas to receive and transmit the requests, the criticisms, the proposals of enlightened minds."[98] Piccioni acknowledged that the party had been indifferent to science policy. Most other presentations focused on the structural and financial problems of science and its importance for Italy's economic growth. As the Italian economy started to show signs of decline, the politicians sought reasons for it and was to continue the "Italian miracle."[99] Most agreed that Italy had failed to establish a policy able to integrate scientific research into the economic sector.[100] Those who accepted this analysis did not notice its asymmetry. It attributed the decline to lack of scientific and technological innovation, but could not explain why, under the same circumstances, the "miracle" had been possible.

96. Edoardo Amaldi, "The years of reconstruction part II," *Scientia, 114* (1979), 439-451.
97. *Una politica per la ricerca scientifica* (Rome, 1962).
98. Piccioni, "Discorso Introduttivo," in ibid., 4.
99. Italy had never grown so fast economically as it did between 1958 and 1963; Ginsborg (ref. 16), chapt. 7.
100. Cf. David Edgerton, *Science, technology and British industrial "decline," 1870-1970* (Cambridge, 1996).

In this context, the physicists dominated Italian science policy. At the meeting of 1961, almost 200 people, including university professors and top Christian Democrat officers, composed the so-called "study group." Over 80% of the professors represented physics, chemistry, or mathematics; at least 41 of them (about 25%) were physicists or worked in subjects related to nuclear physics. A year later, the Party presented a bill to the Senate concerning the organization and development of scientific research in Italy. Approved on March 2, 1963 (Law N. 286), it centralized decision making, coordination, and control processes into one single organization, the CNR (Consiglio Nazionale della Ricerca, National Research Council).[101] For the first time, the Interdepartmental Committee of Reconstruction took responsibility for scientific matters, integrating for this purpose the Minister of Public Instruction, the Minister for the Coordination for Research, and the Minister of Defence (by then Andreotti). According to the new law, the national committees were to have 140 members, 48 of them to be elected from the pool of professors of experimental sciences, mathematics, and technical related fields, and another 16 from the assistants to these professors. Another 34 posts depended indirectly on these 64 members. As a critic observed in 1964, "An assembly in which 98 members out of 140 belong to a certain category, and are the beneficiaries of their own decisions, will express the interests of the category."[102]

The United Nations' technical agencies

Several delegations showed no interest in international scientific collaboration. They preferred national (or regional) programs and bilateral agreements. Industrialized countries considered that the proliferation of international institutes under the UN banner created costly organizations of little benefit to Third World countries and politically uninteresting to industrialized countries. This consideration reflects a general trend in the second half of the 20th century towards the nationalization of science. The Scientific Advisory Committee knew that elite institutions, both in the North and South, were tightly tied to national economic and military systems. A United Nations scientific center would be, in their view, "unnatural" because of a lack of infrastructure to support it.

The power of the new nations in multilateral forums resided in concerted action. The explosion in number of new countries rising from decolonization to membership in the United Nations changed the politics of the organization. Non-nuclear nations felt that the IAEA did not benefit them. Salam played on this belief in arguing that the ICTP could be useful to the Third World. Despite the serious reservations expressed by most industrialized countries, especially the United States,

101. "Scientific policy in Italy." *Minerva, 2* (1963), 210-224.
102. Romolo Saccomani, "La nuova legislazione sulla ricerca scientifica," *Il nuovo osservatore* (Apr 1964), 292-296; this was a special issue of the official review of the Christian Democrat Party devoted entirely to science policy.

and the Soviet Union, they did not want to be perceived as opposing the scientific aspirations of the Third World. Opposing the Centre would be opposing "development," an idea of paramount importance in the relations between the poor nations and the industrialized countries.

The pre-history of the ICTP must be understood in the context of the efforts of two communities striving to move away from their own sense of isolation and periphery. While Budinich and the Trieste elite thought that they could enhance their city's position in the national and international arenas by a donor in international development, the Third World nations and Salam saw in Trieste a peripheral city seeking a new function that they were ready to provide.

ALEXIS DE GREIFF

The tale of two peripheries: The creation of the International Centre for Theoretical Physics in Trieste

ABSTRACT:

The negotiations to create the International Centre for Theoretical Physics took place between 1960 and 1963 within the International Atomic Energy Agency. This study pays special attention to the active roles played by scientists, politicians, and intellectuals from the host-city, Trieste (Italy), and the historical circumstances that allowed this group of local actors to become key figures in the establishment of the Centre. The hostility of delegations from several industrialized countries, the Soviet Union, and India, and the constraints that the American hostility put upon the future of the Centre, are also considered. The paper lies at the intersection of the history of 20th-century physics, international relations of science, and development studies.