Chapter 8
From Science to Science Diplomacy

After retiring from his career in science, Herwig embarked on a new one as a diplomat. "Looking back at my professional life," he explained, "it can be divided into three parts: first I was a physicist, then a manager of laboratories, and the third part is as a kind of diplomat." It could be argued that Herwig's entire career had been leading towards science diplomacy, and in retirement, that is indeed the direction he took.

When Herwig reached his 65th birthday on 28 February 1989, his professorship at the University of Hamburg became, following the time-honoured tradition of academia the world over, and in accordance with German law, an emeritus position. On the same day, his position at CERN came to an end, as did the leave of absence from Hamburg that had allowed him to take the role. "On the one hand, I enjoyed a smooth transition from active employment to retirement, and I could easily have returned to Hamburg," he recalled, "but on the other hand, by this time, my home had become Geneva. I had no close relatives any more apart from my immediate family, and my children had made a home in Switzerland. Ingeborg and I decided to stay."

It was not long until other organisations began to seek Herwig out. First to call was the DPG, the German Physical Society, or *Deutsche Physikalische Gesellschaft*, for which he served as president from 1992 to 1994. The DPG is the largest physical society in the world with about 50,000 members, many of them young physicists: something the society prides itself on. Its seat is at Bad Honnef near Bonn. As with any learned society, the DPG organises conferences, provides support to its community, and nurtures links with schools and industry. The usual role of the president is to chair the governing board and to oil the wheels of the society's activities, assisted by a permanent staff. Herwig, however, had a bigger task to accomplish. "The DPG always gets the most it can out of its presidents," he explained. "Each one is active for many years, because as well as being president, they also have duties as president-elect, and as immediate past president. When I was elected, a historical event was underway—German reunification—and that also applied to the two German physical societies. I oversaw the conversion of the former headquarters of the East German

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society into a new representation of the DPG in Berlin. It was in the Magnus-Haus, one of the oldest buildings in Berlin, and this was a particularly interesting task."

This presidency was followed by the presidency of the European Physical Society (EPS), which Herwig held from 1995 to 1997, again with responsibilities as president-elect and immediate past president. "This was also quite challenging," he recalled. "The society had been in Geneva since it was founded but it was facing severe financial difficulties, so I moved the headquarters to Mulhouse, which was more affordable for the society's limited resources." Herwig's tenure also saw an increased opening to Eastern Europe as it emerged from behind the Iron Curtain, and in particular to Hungary. "I strengthened the EPS office in Budapest," he said, "this was one of the very rare links between East and West at the time. The Hungarian physicist Norbert Kroó provided much support, and later he became EPS president. My task was very much supported by Márta Neményi, a scientific secretary at the Hungarian Academy of Sciences. I spent a lot of time there, which allowed me to discover the beautiful country of Hungary."

There is one more activity that, unknown to Herwig at the time, allowed him to develop the skills he'd need for the third phase of his career. For several decades, he had been an editor for Springer's venerable series of data collections, known simply by the name of its founders: Landolt Börnstein. "Looking back," he recalled, "I do not understand how I could do this on top of everything else, with only 24 h a day available."

Nevertheless, Herwig had been doing his part to ensure that the famous articles and data tables remained up to date, relevant and useful to scientists for much of his professional life. "As a young scientist, I contributed articles in optics and nuclear physics," he said. "Later I became editor for the nuclear and particle physics section, and finally for the whole of physics." Under Herwig's tenure, over 30 volumes were published with Herwig as editor or co-editor. "The changes in publishing over the years have been remarkable," he said. "At the beginning, manuscripts had to be submitted in multiple typed copies whereas today the whole process is digital. I'm also a bit proud that I introduced some special review volumes for particular topics, including three for particle physics, which have recently been published open access under the CERN umbrella."

Through all these activities, Herwig was honing his diplomatic skills, but it was a call from UNESCO, however, that brought everything together, and opened the way to the third phase of Herwig's career. He was about to become a science diplomat.

ROSTE—Getting to Know Venice

In the late 1980s, UNESCO had set up a body known as the Regional Office for Science and Technology for Europe (ROSTE) in Venice [1]. Herwig's successor as Director-General of CERN, Carlo Rubbia, was a member of the office's first Scientific Council, which was set up in 1989. The date was no accident. By the late 1980s, the post-war order in Europe was crumbling, and the Italian government made an offer to

UNESCO to transfer its existing regional bureau for scientific cooperation in Europe from Paris to Venice [2]. "UNESCO wanted to support countries on both sides of the crumbling Iron Curtain," explained Herwig, "and the Italian government had in mind to do something similar for the region of Friuli Venezia Giulia, and neighbouring countries in South East Europe." ROSTE's Scientific Council advised the office's governing body. "The activities were controlled by a supervisory committee with two delegates from Italy and two from UNESCO," explained Herwig, "they took the final decisions on how to use the money available, but they were advised by the council."

By the time Herwig was approached to join the ROSTE Scientific Council in the late 1990s, the office had developed a broad programme of activity covering basic and applied science, as well as societal issues such as addressing brain-drains. It was also active in the application of science and technology to the conservation of cultural heritage, in which the region is rich. "The office was installed first in a beautiful old palazzo located right on the waterfront very close to the famous wooden bridge leading to the museum of the Accademia," recalled Herwig. "These old palazzi belonged to the rich Venetian families that made their fortunes by trading with the Far East or the eastern Mediterranean. The ground floors, close to the water, were used to store goods for ease of access to transportation. The family lived on the first floor. The main floor, and the upper floors were used for offices and to house servants. Over time, these families became poorer, so they could no-longer afford to maintain these palazzi, so they rented the first floor to organisations and installed themselves in the upper floors which were originally used by the servants. So ROSTE was installed on the first floor of the palazzo with a beautiful view of the lagoon from the balcony. It was a real pleasure."

Beautiful though it was, the living quarters of a wealthy Venetian merchant family were not up to the demands of a modern office, so towards the end of Herwig's time with ROSTE, UNESCO's Venice office moved to the Palazzo Zorzi, which had been refurbished to meet modern office standards. "It was very nice from the technical point of view, but one disadvantage was that it was on the ground floor," recalled Herwig. "When there was a bad winter and Venice was flooded, the so called *acqua alta*, then the ground floor of that building was flooded too. I remember sometimes we got into the meeting rooms only by putting on high boots and walking through water some 10 or 20 cm deep."

Herwig served as a member of the ROSTE Scientific Council from 1998 to 2002, for the last two years as its president. During this time, he was able to develop further contacts that he'd established while at the European Physical Society with Eastern European countries. "In a way, it was a continuation of my previous activities," he said. But there were differences too, since because of the Italian government's support, ROSTE also had a mandate in the Friuli Venezia Giulia region of the country. "Sometimes, completely different tasks were involved," he continued. Part of ROSTE's mandate was to help deal with environmental issues such as the pollution of Venice's waterways. "This was a complicated matter of planning and management," he recalled, "but there were more enjoyable aspects. We got involved in supporting the opera house at Padua, because ROSTE had evolved to support

Fig. 8.1 The magnificent Palazzo Loredan dell'Ambasciatore, so called because it was used by ambassadors from the Austrian Empire, served as a UNESCO office when Herwig began his time at ROSTE. Meetings took place in the room with a balcony overlooking the Grand Canal (©Didier Descouens, Wikimedia Commons, CC BY-SA 4.0)

cultural activities as well as science. This was a very interesting part of my time with ROSTE."

The ROSTE Scientific Council met every two to three months in Venice, giving Herwig the opportunity to gain a deeper insight into this unique city than any tourist every could. "There were outstanding European scientists in the council, including, of course, Italian colleagues, some of them from Venice," he explained. "They knew the town and its history very well, and sometimes in the evening after the meetings, they showed us Venice and explained the history and secrets of the town. So, I got to know Venice very well, and knew all the tricks: for instance, I very much liked to visit the cathedral, which is full of treasures, but there's usually a long queue of tourists and it's difficult to get in." Thanks to his Venetian colleagues, Herwig discovered the secret entrance. "There was a little side door that was always open for those who

wanted to pray, and I sometimes used that when I didn't have much time, just to get a glimpse of the treasures inside."

One of ROSTE's meetings fell within Venice's famous carnival, which was an eye opener to Herwig. He was used to the raucous nature of the Mainz carnival, and he discovered that Venice's version was very different. "In Germany, carnival is a very happy and joyous event, but not so in Venice," he began. "In Venice everybody is masked, but it's not just the face, but the whole body that's disguised, so you can't even tell who is a man and who is a woman. Everyone is anonymous: they don't even speak. Carnival in Venice was completely different to what I'd expected, and I also learned from my colleagues that in the old times the carnival played an important social role because for a few weeks all people were equal."

The UNESCO International Basic Sciences Programme

In 2002, Herwig left ROSTE, but his most important work with UNESCO was still to come. "The 'S' of UNESCO stands for science, so UNESCO in a way was responsible for supporting and taking care of science," he explained. "It was very early in the 1990s, I think, that a committee was set up to support the creation and management of large facilities." Forty years earlier, CERN had been the first large research infrastructure to see the light of day under the auspices of UNESCO, and with the success of that endeavour clearly evident by the 1990s, why not try to replicate it in other regions, and in other fields of science?

The year before Herwig left ROSTE, the eminent Polish biochemist, Maciej Nałęcz, was appointed director of UNESCO's division for basic and engineering sciences, and he set about establishing an international basic sciences programme (IBSP) to promote and support fundamental research. "Nałęcz is really a very nice man, fair and impartial, very much dedicated," recalled Herwig. "UNESCO support for science depended on his effort and engagement for many years, and I became very close to him professionally, and also in private life."

By 2003, the IBSP was up and running and Herwig had agreed to be its chair, a position he held until 2009. "IBSP was a very interesting committee because there was strong interest from Russia, notably a former minister, Mr. Fortov, and also important people from Africa," recalled Herwig. "I remember one person from Rwanda, Romain Murenzi, who became a government minister, and later director of the Third World Academy of Sciences in Trieste."

Among the programmes proposed for the IBSP was one that was favoured by Fortov. "The Russians had already rolled out a prototype of a very small and cheap satellite and the idea was that many of them could be used to bring teaching directly into developing-world classrooms, but unfortunately it never took off," explained Herwig. "Another possibility was to teach school teachers." Although the initiative itself did not succeed, it inspired Herwig to pursue the same goal through other channels. "I proposed a collaboration between this IBSP programme and CERN," he explained, "because CERN already had a programme to teach and train

Fig. 8.2 Russian Vice-Premier Vladimir Fortov presents an Order of Friendship to Herwig during a session of the JINR Scientific Council in January 1997 (©CERN, All rights reserved)

schoolteachers. The particularly interesting part of the programme, which covered mainly physics and related fields at CERN, was that the teachers got courses in their own language. CERN could only organise programmes for countries that were members of CERN, so I proposed that this programme should be extended to other countries, in particular to Africa, with the help of UNESCO, and that worked quite well." The programme received funding from the UNESCO IBSP for several years. "Unfortunately, I must say, when the DG of UNESCO changed and Mrs. Bokova became the new DG, the situation became very difficult," said Herwig. "The US decided to leave because UNESCO had agreed to recognise Palestine as a country, whereas in the UN, that was not the case and America strongly supported the Israeli position."

Before pulling out, the US had provided about one-third of the UNESCO budget. "The result was that UNESCO almost completely lost its interest in science and neglected the 'S' in its acronym," Herwig said with regret. "I still had several meetings with Director-General Bokova. I asked for help for SESAME at that time but without result. It seems that recently, UNESCO is changing its policy again. With the new Director-General, maybe UNESCO is getting more interested in science again, but unfortunately the US has not yet come back, and without money not much can be done."

The Nobel Prize-Winner and the President

Herwig's involvement with UNESCO led to some unforeseen consequences, including an encounter between a renowned physicist and a president with his eye on a third term in office. "James Cronin, a very well-known physicist who got the

Nobel Prize, spent a sabbatical year at CERN in ‘82–‘83 and we got to know each other quite well, recalled Herwig. “Several years later he became one of the main promotors of an international project for astrophysics.” The idea was to create an observatory to study the highest energy cosmic ray particles striking the earth. Such an observatory needs to cover a very large area since the highest energy cosmic rays are very rare, so to catch enough to do meaningful research, the detector array has to be big. The observatory was eventually built in Argentina, where an ideal location was found in the province of Mendoza. It’s called the Pierre Auger Observatory after the French physicist who was also one of the founding fathers of CERN.

The Pierre Auger Observatory was proposed by Cronin along with the British physicist Alan Watson in 1992. By the late 1990s, when Herwig was established at UNESCO, the site had been chosen and a management structure was being set up. Herwig was invited to chair a finance board. He agreed to chair a meeting at UNESCO headquarters in Paris because it appeared to offer a way to help his friend Jim Cronin, although other commitments prevented him from going on to chair the board long-term.

Argentina’s president, Carlos Menem, was scheduled to make an official visit to France in October 1998, so on the 13th of that month, a meeting of the Pierre Auger Observatory’s finance board was convened at UNESCO. “It’s not usual for a head of state to visit an international organisation while on an official visit to a country,” said Herwig, “but they could choose for personal reasons to attend a meeting hosted by an international project, so we invited Menem.” The president accepted and was invited to speak along with the DG of UNESCO. “I thought it was quite amusing that I had to give the floor to the DG of UNESCO in his own house,” said Herwig, “but those are the rules of protocol.”

President Menem used the occasion to make the announcement that construction of the Pierre Auger Observatory would begin the following year. Although his ambition to run for a third term came to nought, the Argentinian constitution forebade it - Menem was good to his word. The Pierre Auger Observatory formally came into being in March 1999. Construction began two months later and in 2009, the detector array, covering an area similar to that of Luxembourg, was formally inaugurated [3].

“I get a little bit frustrated sometimes with all the stories about creating new projects and facilities,” recalled Herwig. “So much of the story is lost. All you find is what’s in the minutes of meetings, but in the minutes only the formal decisions are recorded. The real motivation of people, how things were organised and how the ideas evolved, are not in the official minutes. Today, if you look up the Pierre Auger Observatory, which has become a very successful international project, so much of its history is forgotten. You find the name of Jim Cronin, of course, but there’s no real understanding of the amount of work that he put in to getting the project going, and that’s a little bit sad.”

Excursions into Nuclear Fusion

"Looking back at my life, I don't know how I did all these things after I retired from CERN, because the day was still only so long, and I had still a family and other interests," said Herwig. "I was combining very many activities in parallel, with a lot at the same time."

One of those activities goes back to the early part of Herwig's career, when he was working in Hamburg. "In the 1970s physicists in Europe, or even in the whole world, were still a relatively small family, we were not so many people like today, so we knew each other quite well," he explained. "Nowadays it's difficult to get to know all the colleagues even in your own field." In the 1970s, the disciplines of physics were also much more fluid than they are today. "I must say, I preferred that because I was always interested in physics as a whole." As a consequence, Herwig came to know astrophysicist, Arnulf Schlüter, who moved from theoretical astrophysics in 1965 to become director of the Institute for Plasma Physics (IPP) in Munich. "This institute was founded at the initiative of Heisenberg," said Herwig. "If we look back, it's always the same few people with vision asking questions about natural phenomena, so it was Heisenberg who proposed the institute in Munich." Established as an independent institute in 1960 in Garching, just outside the Bavarian capital, it soon became part of the Max Planck Society and remains so to this day.

Schlüter wanted to understand the fourth state of matter, which makes up the bulk of the universe. "The original idea in Munich was to study plasma physics," explained Herwig. "Plasma is a heated gas, heated to such an extent that the atoms became ionised, which means they are now charged particles, and therefore behave completely differently to a normal gas, because the particles of the gas feel an electromagnetic interaction. The behaviour of plasma clouds in the universe is completely different from other dust or gas clouds, so many people were studying the behaviour of such plasma clouds in the universe."

Stars are made of plasma, and they generate energy through nuclear fusion reactions in the extremely hot, dense plasmas at their cores. By the 1950s, people had started to speculate whether it might be possible to replicate this process on Earth. Eminent physicists such as Andrei Sakharov and Igor Tamm [4] in the Soviet Union proposed a device called a tokamak in 1950, which would confine super-hot plasma inside a magnetic field where the conditions for fusion would be right. One year later, an alternative magnetic confinement device, called a stellarator, was proposed by the American theoretical physicist Lyman Spitzer. Herwig became aware of magnetic confinement fusion energy research at the second Atoms for Peace conference held in Geneva in October 1958, where the Russians revealed their work on tokamaks for the first time to the international community.

"In a way, it's the cleanest way of producing energy because there's no big problem with waste," explained Herwig. "But the question is, how do you get it working? Of course, one could accelerate protons to high energies in an accelerator and shoot them at other protons, but the number of fusions would be much too low. Another possibility is to copy the Sun by heating the plasma to a very high temperature

so that the motion of the individual nuclei becomes so fast that they overcome the electrostatic repulsion, and fuse together. The problem then is that when the plasma is very hot, it's very difficult to enclose it because it would melt any material you tried to hold it in. The only way is to enclose the plasma by magnetic fields, but that's easier said than done." Magnetic fields keep the plasma away from the walls, but the plasma is very unstable, breaking up easily and losing energy. "Understanding plasma instabilities, and how to control them soon became one of the main topics of plasma physics, not only from a scientific point of view, but also from a practical point of view to create fusion," said Herwig. "Whenever I visited the IPP, I asked Schlüter, "How fast do you think you'll go?" Every time I went there, I asked that same question, and Schlüter always gave the same answer: "It will take 30 years." So, after going there for 10 years and still getting the same answer, I said: "Look, you always give me the same, answer, aren't you making any progress?" He said, "we are very consistent, we always give the same answers, we don't change our position." That was, of course, a joke, but the trouble is, this problem is still a serious issue in fusion energy research even after about 60 years."

Because of his personal visits to the IPP, friendship with Schlüter, and his experience with large projects, Herwig was later invited to become a member of the institute's board of governors, its *Kuratorium*, on which he served for over 12 years. "The Kuratorium is the highest governing body of the IPP and is chaired by the president of the Max Planck Society," explained Herwig. "Its members are representatives of the Federal Ministry of Research, the Bavarian government and so on, and in addition there were two or three independent scientists, including me. I was invited in the 1980s, when I was DG at CERN, not because I'm a plasma physics specialist, but because they have similar issues to large facilities like CERN." By this time, Schlüter had retired, and the director of the institute was Klaus Pinkau. "He was a very well-known physicist in Germany," said Herwig, "and someone I also knew from a long time before. When he retired, he was followed by Alex Bradshaw, a British man, who later followed me as president of the European Physical Society. The last director in the period I served on the Kuratorium was Friedrich Wagner. I had close contacts with all three of them and working with them was very enriching for me."

The IPP's main facility when Herwig was on the Kuratorium was ASDEX, the axially symmetric diverter experiment, a tokamak. "In a tokamak the plasma is enclosed in magnetic fields, but to heat it up you need a fast-changing field to heat the plasma by induction. This is done in a pulsed mode, tokamaks are pulsed machines, so long pulses are important. Another major research effort concentrates on controlling instabilities. Over the years the IPP has made fundamental contributions to these problems, and today is contributing to studies that feed into the big ITER project under construction in southern France, which is a world-wide collaboration including the USA and Japan."

During Herwig's time as a member of the Kuratorium, Germany underwent significant change with the fall of the Berlin wall and German reunification starting in 1990. This had repercussions across the country, and the IPP had an important role to play. "There was a push to boost scientific and technological activities in the new

Länder of the Federal Republic," said Herwig, "so the idea of creating a new institute there arose." The town of Greifswald, close to the Baltic Sea and gateway to Germany's two largest islands, Rügen and Usedom, with landscapes made familiar through the work of nineteenth century romantic painter Caspar David Friedrich, was chosen to host a new branch of the IPP. "The main problem was to find qualified personnel," recalled Herwig. "The only way to start that was to transfer personnel from Garching to Greifswald, but there was a lot of reluctance because everyone had families in Munich, and after unification infrastructure in the new *Länder* was not the same as in Munich." Nevertheless, an institute was established in Greifswald in 1994. "One key factor was that Friedrich Wagner volunteered to go and become the first director of the new institute at Greifswald."

The plans for Greifswald were exciting and ambitious. Tokamaks had been the main focus of magnetic confinement fusion since the 1950s, but time had shown that their pulsed operation was a major hurdle to viable energy production. A different kind of confinement device known as a stellarator, on the other hand, has a geometry that allows continuous plasma operation, but stellarators are not without their own challenges. The IPP decided to address them in Greifswald by building the world's largest stellarator. "Stellarators, as their name suggests, try to copy what happens in stars, where energy is created continuously by fusion, but building a stellarator is technically very complicated," said Herwig, "it requires a very complicated magnetic field. Stellarator fields can be calculated with modern computer programs, but their practical realisation is extremely difficult." Nevertheless, the Greifswald team came up with a proposal, and the machine was built. "It is called Wendelstein after a mountain near Munich," smiled Herwig, "that showed a certain nostalgia for the Munich laboratory among people from Bavaria, which is very mountainous, whereas Greifswald is completely flat."

Wendelstein 7-X, to give it its full name, produced its first plasma on 10 December 2015, and a vigorous programme of research has been underway since then. There has been huge progress in fusion research with tokamaks, and more recently, many promising results from Wendelstein 7-X, but viable fusion energy is still some way in the future. "Nevertheless," said Herwig, "fusion is a very attractive possibility for new energies. It does not involve uranium or plutonium, just hydrogen isotopes as fuel and helium as ash."

The European Atomic Energy Community, Euratom, had been interested in fusion research from the moment it was established in 1958. "In the framework of this programme, I was asked to join an advisory committee in Brussels in the early 1980s," said Herwig. "We had long discussions. Some of the industrialists said that the tokamak idea is bad because a public facility providing energy must be continuous, not pulsed, because that's not reliable. But then some engineers said it could be made reliable. I remember Heinz Riesenhuber, who was Minister of Research and Technology in Germany, and one day he asked me, "what are the outcomes of this committee in Brussels? How long do they think it will take to produce fusion energy in an industrial way?" I told him, "It's not so clear, but it seems certain it will take at least 30 years before we have an industrial kind of facility." "My God," Riesenhuber answered, "what a disaster, because yesterday I had to give a report to our parliament in Germany, and I told them it would be done within 20 years." So, that shows how difficult the communication between science and politics is.

Fig. 8.3 The Max Planck Institute for plasma physics in Greifswald, northern Germany, is host to the world's largest stellarator fusion device, Wendelstein X-7. The name is taken from a Bavarian mountain close to the original MPI for plasma physics in Garching, near Munich. The roofline is inspired by the waves of the nearby Baltic Sea (Courtesy of the Max-Planck-Institut für Plasmaphysik, photo: Ben Peters, ©Max-Planck-Institut, All rights reserved)

Today's big project in tokamak-based magnetic confinement fusion is ITER, the International Thermonuclear Experimental Reactor, at Cadarache in the south of France. It is scheduled to produce its first plasma in 2025. It should be the first tokamak to deliver more energy than is used to heat the plasma, a major milestone, but it will not deliver economically viable electricity to the grid. That is planned for the successor to ITER, DEMO, whose design will be shaped by results from ITER, and which could be delivering clean, economically viable energy by 2050. "Industrial fusion energy is still 20–30 years away," said Herwig, "but I'm confident that we'll get there, and when we do, particle physics will deserve some of the credit. For instance, the huge magnets they use need superconductivity, and the development of superconducting magnets was done to a large extent at CERN and other particle physics labs."

A Cuban Interlude

One project that Herwig worked on with UNESCO, although ultimately unsuccessful, served almost as a template for one of the greatest achievements of the third phase of his long career. It all started around 1996 in Cuba.

Russia, or more specifically, the Joint Institute for Nuclear Research (JINR) in Dubna, an international organisation, had made the gift of a small particle accelerator

and it was being unpacked at the University of Havana. "They soon realised that they were not able to get the machine working without outside help," said Herwig, "although they had a quite good technical team." The idea of turning it into an international project serving the countries of central America soon emerged, and Cuba asked UNESCO to help. In turn, UNESCO asked Herwig to look at the proposal.

"Investigations in central American countries showed that there was indeed some interest in such a project," explained Herwig, "particularly in Mexico, so UNESCO decided to set up a special committee, and I was asked to chair it." Things got off to a good start, with meetings in Yucatan, the Cozumel Islands and in Havana. "At the beginning, it seemed quite possible to establish an international laboratory in Cuba." Things started to go wrong, however, when it came to finding a budget for the building that would house the accelerator. The budget required was around $600,000. "In Cuba there was a split budget," remembered Herwig, "separate parts for Cuban and US currencies, and buildings had to be paid for in dollars." The University of Havana did not have a dollar budget sufficient for this project and things did not look any better at the government level. "In discussions with the relevant ministers and other functionaries, I soon found out that they were unable to spare that many dollars."

None of the other central American countries involved in the project was prepared to put up the money, so a bid was made to the International Atomic Energy Agency (IAEA) in Vienna. "After very long discussions, this request was refused, and because Cuba couldn't find $600,000 and UNESCO did not have the budget either, the project

Fig. 8.4 In the mid-1990s, the JINR made the gift of a small particle accelerator to the University of Havana, and Herwig found himself charged with establishing an international laboratory around it. Despite his best efforts, funding was not forthcoming, and the gift was never put to use (©Anton Zelenov, Wikimedia Commons, CC BY-SA 3.0)

failed. As far as I know that accelerator is still sitting there gathering dust at the University of Havana," rued Herwig, many years later.

Herwig's Cuban experience nevertheless served as a template for things to come. Later, he and Maciej Nałęcz would turn their attention to a fledgling project to replicate the CERN model in the Middle East. A project that would go on to be one of the great successes of science diplomacy: SESAME (see Chap. 11).

IUPAP Looks into the Role of Women in Physics

In 1999, the American Physical Society (APS) celebrated its 100th birthday with a conference in Atlanta, Georgia with over 11,000 participants. These included members of the International Union of Pure and Applied Physics (IUPAP), which had chosen to hold its general assembly in the margins of the conference. The APS

Fig. 8.5 Herwig worked with many illustrious women physicists over his long career, including Lise Meitner and Chien Siung Wu. It is therefore perhaps not surprising that he was a member of the original IUPAP working group five on women in physics, photographed here during a visit to the Whitehouse in 2000 (©Holly Gwin, All rights reserved)

had also invited Cecilia Jarlskog who chaired the Nobel Committee for Physics at the time. At the IUPAP general assembly, she was seated close to the head of the Swedish delegation, Anders Bárány, and when the call came for any other business, she whispered in his ear that they should do something for women in physics. He made the suggestion, and that's how the IUPAP's Working Group 5 on Women in Physics was founded. Herwig was invited to join. "I was the only man among about a dozen women," recalled Herwig, "and I noted how different these meetings were compared to those that take place in all-male committees—much smoother discussions, though the outcomes were probably the same because whatever their debating style, scientists are first and foremost scientists with the same rational, evidence-based, approach to the world. All participants were against introducing quotas for women but agreed that their careers should be based on their achievements."

Forum Engelberg

Another organisation that sought out Herwig's help when he retired went by the name of Forum Engelberg. "At a time when science and technology were becoming ever more present in people's lives, someone like me who knows how science works and who also has experience in the management of smaller or larger organisations turned out to be much in demand," he recalled. "I believe that such a need exists today even more than it did 30 years ago."

"A former member of the Swiss delegation to CERN, Bernard Ecoffey, had the idea of creating a scientific forum with the aim of organising meetings to discuss general problems of global importance concerning technologies and society and to foster better relations between governments, industry and science," explained Herwig, "He asked me to chair it's scientific committee." Ecoffey chose a beautiful alpine resort to hold these meetings, and he named his initiative after it: Forum Engelberg. "Ecoffey managed to get funding from the Swiss federal and local governments as well as from industry, individuals and the EU," remembered Herwig. "I asked the French science minister, Hubert Curien, to be president of the forum, and we managed to attract some great speakers."

After about ten years in the role, Herwig stepped down, but he kept some precious memories from the meetings in Engelberg, and in particular, its historic Benedictine monastery. "A highlight of each forum was a dinner in the private rooms of the Abbot, Berchtold Müller, a very cultured man," said Herwig. "Over the years, I got to know him rather well, and he granted me a special favour. Occasionally he offered me a guest room in the monastery, from which it was just a few strides to the great church and its famous organ which had been played by Felix Mendelssohn-Bartholdy when he travelled on foot through Switzerland. I was given the key and at 5 a.m. when the church was not in use I was allowed to play. It was a miserable attempt since without any instructions I was unable to master the organ's several manuals and hundreds of

Fig. 8.6 The famous organ at Engelberg's Benedictine monastery, played by Felix Mendelssohn-Bartholdy during his travels through Switzerland, and by Herwig Schopper through his association with the Forum Engelberg (©W. Bulach, Wikimedia Commons, CC BY-SA 4.0)

registers. Forum Engelberg no longer exists, but the spirit of it continues. Today the Academia Engelberg [5] organises some very interesting dialogues."

The Foundation of the Cyprus Institute

One of Herwig's proudest achievements in retirement was his contribution to the foundation of the Cyprus Institute. "It all started on the initiative of just a few people," said Herwig. "I met Costas Papanicolas from the University of Athens at CERN in 1999, and he asked whether I would be prepared to participate in the foundation of a new university in Cyprus, a strongly developing country, but in great political difficulties because of its division into Greek and Turkish parts." Herwig agreed and at the beginning of 2000 took part in a meeting of a small group of people in a London hotel. "There were two representatives of the Cyprus Development Bank, John Joannides and Andreas Mouskos, who were prepared to provide some initial funds," recalled Herwig, "and the rest were academics: Costas Papanicolas, of course, Guy Ourisson who was president of the French Academy of Sciences, Frank Rhodes, who had served as president of Cornell University, Ernest J. Moniz of MIT, who later became US Secretary of Energy, and me. Papanicolas wanted the new university to

be organised around departments covering different areas of research like MIT, rather than faculties, which explained the mixture of Europeans and Americans."

In that London hotel, this small group of people gave themselves the task of setting up the university by 2005. "During this planning period, we had many discussions involving the Cyprus government," said Herwig, "and it was decided that the Cyprus Institute should be a non-profit research and education institution with two complementary academic structures: a college, and the research centres devoted to special areas of technology." The institute operates under the aegis of the Cyprus Research and Educational Foundation (CREF), which is governed by a board of trustees and was established in 2004. One year later, the Cyprus Institute itself was formally established. "All the members of the founding team became trustees," said Herwig, "but unfortunately only three of us, Papanicolas, Moniz and me, lived to see the institute in full swing from 2007." Herwig was appointed as the first chair of a scientific advisory council and remains a member of CREF as a trustee emeritus. "The chair of CREF was taken for a number of years by Edouard Brézin, a physicist and former president of the French Academy of Science and is now occupied by Dan-Olof Riska, a professor at Helsinki University," said Herwig. "I proposed him for this post knowing him as chairman of the CERN pension fund. An executive committee is chaired by Andreas Pittas, who is very influential in the Cypriot economy."

Herwig, of course, made the most of his involvement with the Cyprus Institute, discovering the island, along with its history and culture. "Playing a part in the foundation of the institute was an extremely interesting experience," he explained. "Of course, the early years were rather busy since the institute was of great importance for the integration of Cyprus into the EU, so I had many occasions to visit the presidential palace in Nicosia. Over the years I got to know all the presidents and was impressed how much they believed in the importance of science regardless of their political colour. These meetings also gave me the opportunity to discuss and recommend the participation of Cyprus in CERN, and I'd like to think that I had some influence on the country's decision to join CERN."

Herwig's tourism in Cyprus carries bittersweet memories. "For me getting to know the Green Line between the Greek and Turkish parts of Cyprus was very emotional," he explained, "since it reminded me vividly of the Berlin Wall. My first crossing was somewhat complicated but over the years it has become easier. We hoped that the activity of the Cyprus Institute could be used to establish better relations between the two parts. I organised some private meetings with scientists from both sides of the line, but so far they have not really borne fruit."

"Costas Papanicolas was an essential guide to the history and culture of Cyprus," said Herwig. "Cyprus is almost unique, lying on the way between orient and occident, and offering sailors a place of rest. Over the centuries, many cultures have left their mark. I remember the surprise I felt when crossing from the Greek to the Turkish side to be confronted by a 13th century gothic cathedral built by the French Lusignan family, which is now used as a mosque. I also learned about how Richard the Lionheart conquered the island on his way to the Holy Land, apparently just to rescue his fiancée. Finally, I want to mention the beautiful landscape of Cyprus ranging from the high Troodos mountains to the Mediterranean shores, which I enjoyed on many occasions

Fig. 8.7 Pioneers of the Cyprus Institute at a meeting of the Institute's Board of Trustees. Left to right: Herwig Schopper, Costas Papanicolas, Director of the Institute, Andreas Pittas, Chair of the Executive Committtee and George Vassiliou, Former President of Cyprus and a founding member of the Institute (Herwig Schopper's personal collection. ©Herwig Schopper, All rights reserved)

on vacation with my wife. We developed very warm relations with my colleagues in Cyprus, and I can only hope that a solution will be found to bring the two parts of the island to live together peacefully."

Fig. 8.8 President of Cyprus, Demetris Christofi presented the Grand Cross of the Order of Merit of the Republic of Cyprus to Herwig at a ceremony in the Presidential palace in Nicosia in December 2012 (© Cyprus Institute)

In His Own Words: Exploring Cuba

"Working for the Central America project gave me a very interesting opportunity to learn about Cuba, and I got to know the country much better than I would have done as a tourist. I came to like it very much and went back several times on holiday with my family.

The first thing that surprised me when we arrived in Havana is that everywhere in hotels, and in offices, there were no pictures of Fidel Castro. After all, he was the Head of State, and it's normal in official buildings to see pictures of the Head of State. That was not the case in Cuba. I didn't see a single picture of Fidel Castro, but there were a lot of pictures of Che Guevara. I enquired why that was, and I got a lesson in Cuban history. I learnt that at the end of the First World War, US marines had been stationed on the island because the US invoked the Platt Amendment, signed in 1901. After the Spanish–American war of the previous century, Spain had ceded Cuba to the US, and although Cuba became independent in 1902, the Platt Amendment allowed the United States to intervene in Cuba. I learned that because of the Platt Amendment, although Cuba was independent, Americans exercised a lot of influence, and owned a lot of property. People told me that this sowed the seeds for the US-backed dictator Batista, and eventually the Cuban revolution that brought Castro to power in 1959. Cubans are not really enthusiastic communists. They never liked the influence of the Soviet Union very much, but on the other hand, they were really afraid of the US, fearing that another Batista could take over again. Maybe that's why they put up pictures of the romanticised heroic freedom fighter, rather than their Head of State? Of course, the revolution led to sanctions from the US, driving Cuba into the arms of the Soviet Union and giving rise to the economic difficulties the country still experiences today. One strange consequence I discovered is that you

could go to any public telephone in the street, and call anywhere you wanted, but not the United States.

I was impressed by the charm of the country, which was flourishing when it first became independent. Many buildings in Havana reminded us of Paris, like the main avenue with hotels and all kinds of beautiful old palaces. We went to the places where famous visitors like Hemingway spent many years, taking our aperitifs in the same bars that he did. In Havana, I usually stayed in the Hotel Nacional, which is quite modern and close to the sea. The streets were full of vintage cars, hardly any new ones. For vacations, we usually went in winter, when Europe is freezing and Cuba has beautiful sunshine. We stayed in Varadero, a resort about 100 km from Havana and easily reachable by taxi where we could swim and sail. Another consequence of sanctions is that people would ask you for soap when you came out of your hotel.

On one occasion I paid a visit to Santiago de Cuba, which is an old town at the eastern end of the island that you had to get to by air. That was a real adventure. The plane was an old turbo prop, and besides the pilot, there always had to be a mechanic with all his tools so he could repair the plane if it got into trouble.

So, that's the background for my activities in Cuba. In conclusion, I'm still sorry that the UNESCO project to establish an international laboratory in Cuba failed, but my main regret is that very short-sighted western policy opened the door to Soviet influence in a part of the world where there was none. And I'm afraid that the present situation in the country still reflects this."

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