



HAL
open science

Cécile Morette and the Les Houches summer school for theoretical physics; or, how Girl Scouts, the 1944 Caen bombing and a marriage proposal helped rebuild French physics (1951–1972)

Pierre Verschueren

► To cite this version:

Pierre Verschueren. Cécile Morette and the Les Houches summer school for theoretical physics; or, how Girl Scouts, the 1944 Caen bombing and a marriage proposal helped rebuild French physics (1951–1972). *British Journal for the History of Science*, 2019, 52 (4), pp.595-616. 10.1017/S0007087419000505 . hal-02419395

HAL Id: hal-02419395

<https://hal.science/hal-02419395v1>

Submitted on 25 Mar 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Cécile Morette and the Les Houches
summer school for theoretical physics; or,
how Girl Scouts, the 1944 Caen bombing
and a marriage proposal helped rebuild
French physics (1951-1972)

Citation : Pierre VERSCHUEREN, « Cécile Morette and the Les Houches summer school for theoretical physics; or, how Girl Scouts, the 1944 Caen bombing and a marriage proposal helped rebuild French physics (1951-1972) », *The British Journal for the History of Science*, 52 (4), 2019, p. 595-616.

In 1949, Yves Rocard, the influential director of the physical laboratories at the *École normale supérieure* (ENS), wrote: “The Hiroshima explosion produces physicists, the Ministry of National Education decrees does not”¹. The post-Second World War French scientific world was marked, like many other Western ones, by the appearance of “big science” and the birth of what can be called a “nuclear culture”². Following this war-born, American mode of knowledge production, France’s scientific field and its higher education system were reshaped by a steady growth in the scientific population, a development of large-scale projects and massive government funding³. The consequences for research training were tremendous, especially in physics: confronted with the apparition of a new regime of production of scientific facts, universities faced the necessary implementation of a new regime of production of scientific elites⁴. In France, the research training part of the higher education system spearheaded the universities’ massification. For instance, the number of students preparing a *doctorat ès sciences* increased dramatically: from sixty-four

This essay is based on research jointly funded by an Alliance Doctoral Mobility Grant (Columbia University), the Université Paris 1 Panthéon-Sorbonne, the Institut d’histoire moderne et contemporaine (UMR 8066, CNRS/ENS/Paris 1) and the chair of sociology of creative work, Collège de France. For their counsel and support, the author would like to thank Julien Barrier, Nicolas Constans, Leticia Cugliandolo, Robert Fox, Gabriela Goldin Marcovich, Andrew MacGillivray and Yann Renisio.

1. Yves ROCARD, “La querelle de l’agrégation”, *E.N.S. physique*, 4, April 1949, p. 2. All translations are mine.

2. Peter GALISON and Bruce HEVLY (eds.), *Big Science: The Growth of Large-Scale Research*, Stanford: Stanford University Press, 1992; Jonathan HOGG and Christoph LAUCHT (eds.), *British Nuclear Culture*, *BJHS*, 45 (4), 2012; Jonathan HOGG, *British Nuclear Culture: Official and Unofficial Narratives in the Long 20th Century*, London: Bloomsbury Academic, 2016; Gabrielle HECHT, *The Radiance of France: Nuclear Power and National Identity after World War Two*, Cambridge, MA: MIT Press, 1998.

3. Dominique PESTRE, “Les physiciens dans les sociétés occidentales de l’après-guerre: Une mutation des pratiques techniques et des comportements sociaux et culturels”, *Revue d’histoire moderne et contemporaine*, 39 (1), 1992, pp. 56-72; Daniel KEVLES, *The Physicists: The History of a Scientific Community in Modern America*, Cambridge, MA: Harvard University Press, 1995. For the French case see Dominique PESTRE, “La reconstruction des sciences physiques en France après la Seconde Guerre mondiale: Des réponses multiples à une crise d’identité”, *Réseaux*, 14, 1996, pp. 21-42; François JACQ, “Pratiques scientifiques, formes d’organisation et représentations politiques de la science dans la France de l’après-guerre: La politique de la science comme énoncé collectif (1944-1962)”, PhD thesis, *École nationale supérieure des mines de Paris*, 1996; Pierre VERSCHUEREN, “Des savants aux chercheurs: Les sciences physiques comme métier (France, 1945-1968)”, PhD thesis, Université Paris 1 Panthéon-Sorbonne, 2017.

4. I use the term “regime of knowledge production” in the sense defined by Dominique PESTRE, “Regimes of knowledge production in society: towards a more political and social reading”, *Minerva*, 41, 2003, pp. 245-261.

defences in 1944, the Faculties of Sciences reached 226 in 1955 and 832 in 1968. Whereas the number of doctorates was multiplied by thirteen, the overall student population of the science faculties was only multiplied by five during the same period, indicating the extent of change. This exponential growth occurred primarily in the field of physical sciences; 46 per cent of doctoral degrees in sciences were awarded for a thesis in physical sciences in 1944, 57 per cent in 1955, and 72 per cent in 1968¹. Such a profound reconfiguration in the French academic field was thoroughly intertwined with an acceleration in the internationalization of science. During the interwar period French physicists, like the rest of the scientific world, were more or less confined in what Robert Fox called a “national turn”; during the Second World War, many leading scientists went to the United States as refugees or Free France members, notably Pierre Auger, Francis Perrin and Léon Brillouin². After the war, these contacts proved themselves lasting and invaluable: they were unanimously seen as powerful levers to foster a much-needed catch-up effect. Relations with these émigrés profoundly shaped the rebuilding of scientific programmes and higher education. Young French physicists, especially, henceforth turned their eyes towards the US, the world’s leader in science and technology. Many of those graduate students were sent to the other side of the Atlantic, in order to help re-establish an effective and competitive research system in France. For instance, Jean Brossel, who would become a leading physicist in quantum optics, spent three years at the University of Manchester, from 1945 to 1948, then another three years at the Massachusetts Institute of Technology (MIT), from 1948 to 1951, before coming back to the ENS, where he was instrumental in the foundation of the Laboratoire de spectroscopie hertzienne, as Alfred Kastler’s right-hand man. The US strongly encouraged this circulation of scientists, seeing it as a way to promote not only

1. See Pierre VERSCHUEREN, *op. cit.*, pp. 3-4.

2. Robert FOX, *Science without Frontiers: Cosmopolitanism and National Interests in the World of Learning, 1870-1940*, Corvallis: Oregon State University, 2016, pp. 81-92. The interwar confinement was described, for physics, by Dominique PESTRE, *Physique et physiciens en France, 1918-1940*, Paris: Éditions des archives contemporaines, 1994. It was nuanced by Christophe CHARLE, “Ambassadeurs ou chercheurs? Les relations internationales des professeurs de la Sorbonne sous la IIIe République”, *Genèses*, 14, 1994, pp. 42-62. For the circulation of scientists during the Second World War see Giuliana GEMELLI (ed.), *The Unacceptables: American Foundations and Refugee Scholars between the Two Wars and After*, Brussels: Peter Lang, 2000; Diane DOSSO, “Louis Rapkine (1904-1948) et la mobilisation scientifique de la France libre”, PhD thesis, Université Paris 7, 1998. On the specific contribution of the French physicists to the war effort the classic reference is Margaret GOWING, *Britain and Atomic Energy, 1935-1945*, London: Macmillan Publishing, 1964, esp. pp. 209-215, 289-296, 342-346.

its scientific and technological agendas in Western Europe, but also its Cold War political and ideological agendas as well. The Fulbright programme may be the most obvious example of this exploitation of scholars' circulation to beat swords into ploughshares¹. The international circulation of scientists was therefore a fundamental aspect of the reconstruction and reorganization of French higher education. It is undeniable that the circulation of ideas happened on a global scale for a very long time, through various intermediaries, for instance the large-scale spreading of scientific journals and the culture of scientific internationalism². But it was only after 1945 that the circulation of individuals, and with them experimental practices and organizational methods, became critical in the world of physical sciences. No longer was international journeying the culmination of a handful of exceptional careers, free of laboratory servitude (e.g. Marie Curie, Paul Langevin, Jean Perrin)³. To put it in a nutshell, during the 1950s and 1960s a new type of transnational scientific elite emerged. Internationalism was no longer the prerogative of scientific celebrity, but an element of distinction, unusual but no longer exceptional.

This transformation was made possible by the creation of a series of new institutions and programmes, destined to facilitate and structure such circulations – as the state of the foreign-currency market (and national policies) made it disproportionately expensive for a European scholar to live in the US⁴. The purpose of this essay is to explore the history of what was surely one of the strongest elements of that social apparatus, and one of the most innovative: the first and most effective “crash course” in theoretical physics, the Les Houches School of Theoretical Physics, a summer school founded by Cécile Morette in 1951, in a small alpine village. By doing so, I

1. John KRIGE, *American Hegemony and the Postwar Reconstruction of Science in Europe*, Cambridge, MA: MIT Press, 2008. On the Fulbright programme see Whitney WALTON, *Internationalism, National Identities, and Study Abroad: France and the United States, 1890-1970*, Stanford, CA: Stanford University Press, 2010.

2. For the ever-proliferating field of transnational history of science, I limit myself to referring to Simone TURCHETTI, Néstor HERRAN and Soraya BOUDIA, “Introduction: Have we ever been ‘transnational’? Towards a history of science across and beyond borders”, *BJHS*, 45 (3), 2012, pp. 319-336. More specifically, on the crucial role of go-betweens see Kapil RAJ, Simon SCHAFFER, Lissa ROBERTS and James DELBOURGO (eds.), *The Brokered World: Go-Betweens and Global Intelligence, 1770-1820*, Sagamore Beach: Science History Publications, 2009.

3. For a discussion of the comparative lack of circulation in the physical sciences see Michael HEFFERNAN and Heike JÖNS, “Research travel and disciplinary identities in the University of Cambridge, 1885-1955”, *BJHS*, 46 (2), 2013, pp. 255-286.

4. Pierre VERSCHUEREN, “Les habits neufs de l'internationalité: Les sciences physiques entre la France et le monde (1945-1960's)”, in Pierre-Michel MENGER (ed.), *Le talent en débat*, Paris: Presses universitaires de France, 2018, pp. 135-181.

intend to plead for the importance of taking into account the various sociological and institutional conditions of possibility of science’s transnationality – as they may be, paradoxically, local and contingent.

1 The birth of a school

The school was the brainchild of Cécile Morette (1922-2017), a young French theoretical physicist whose career path was early confronted with the challenges of science internationalization¹. After graduating from the University of Caen with a *licence ès sciences physiques* (bachelor’s degree) in 1943, and preparing a *diplôme d’études supérieures* (DES, master’s degree) in Paris under the tutelage of Louis de Broglie in 1944, she was recruited in October 1944 as junior researcher of the Centre national de la recherche scientifique (CNRS) by its director, Frédéric Joliot. At that time, only 15 per cent of CNRS researchers in physics were women, and less than 10 per cent in theoretical physics². While working on her doctorate, she was to act as “house theorist” for his laboratory of nuclear chemistry at the Collège de France, helping the professor with his lectures and answering the letters sent by his more theory-oriented colleagues. This situation confronted her directly with the scientific chasm created between France and the rest of the physics world by the Nazi occupation and the idiosyncrasies of de Broglie’s school of theoretical physics³. As Morette described in a 1995 interview,

Joliot asked me to read the Bohr and Wheeler paper, which he said was important. Joliot [...] recognized there was some importance there and

1. Morette herself returned on more than one occasion on her life. Marie-Laure THÉODULE, “Cécile Morette-DeWitt, militante de la physique”, *La Recherche*, 345, 2001, pp. 24-25; Toni FEDER, “Path integrals, Les Houches, and other adventures of Cécile DeWitt-Morette”, *Physics Today*, 61, August 2008, pp. 28-30. Her death in May 2017 resulted in many obituaries, in particular “University of Texas. Cécile DeWitt-Morette. December 21, 1922-May 8, 2017”, at <https://web2.ph.utexas.edu/utphysicshistory/CecileDeWittMorette.html>; and Toni FEDER, “Snapshots from the life of Cécile DeWitt-Morette”, at <https://physicstoday.scitation.org/doi/10.1063/PT.6.4.20171010a/full>.

2. On Frédéric Joliot see Michel PINAULT, *Frédéric Joliot-Curie*, Paris: Odile Jacob, 2000. The percentage of women in the CNRS was calculated in the *Annuaire du Centre national de la recherche scientifique 1949*, Paris: CNRS, 1949. For a general approach see Martine SONNET, “Combien de femmes au CNRS depuis 1939?”, in *Les femmes dans l’histoire du CNRS*, Paris: CNRS, 2004, pp. 39-67.

3. Adrien VILA-VALLS, “Louis de Broglie et la diffusion de la mécanique quantique en France (1925-1960)”, PhD thesis, Université Claude Bernard – Lyon 1, 2012.

wanted somebody to read it. And as a matter of fact, I think that was the point at which he decided to hire me as a theorist [...] and the first job was to read the Bohr and Wheeler paper.

But not having any quantum mechanics of anything [...] I couldn't make head or tail of it. And that's what started for me the whole process of telling Joliot, "I've got to speak to somebody. I have got to go [somewhere else] to see what's going on"¹.

An opportunity for such mobility arose at the recently founded Dublin Institute for Advanced Studies (DIAS), where the German refugee Walter Heitler succeeded another refugee, Erwin Schrödinger, as director of the School of Theoretical Physics in December 1945². The new director intended to strengthen the DIAS's international recognition, strongly supported in this endeavour by Taoiseach Éamon de Valera, who saw in the project a means to enhance Ireland's status and prestige³. Through his vast network of contacts, Heitler sent invitations to several major physicists, including Joliot, seeking suggestions for young scholars interested in joining the institute. Morette seized the opportunity: she spent the 1946-1947 academic year in Dublin, working on the creation of mesons in nucleon-nucleon collisions with Heitler, Hwan Wu Peng and Ning Hu⁴. She came back with the material for a doctoral thesis which she defended on 25 March 1947. But her return was to be temporary: with Joliot and de Broglie's joint benediction, she joined Niels Bohr at the Institutet för Teoretisk Fysik, in Copenhagen, as a Rask-Oersted fellow, from September 1947 to spring 1948. She then became a member of the Institute for Advanced Study (IAS), Princeton, for two years, invited by its director, Robert Oppenheimer, on the recommendation of Bohr and Heitler. During spring 1950, the French Ministry of National Education (through its Direction de l'enseignement supérieur), hoping to finally draw upon the international capital thus accumulated, and the scientific skills Morette had acquired abroad, let her know that a tenured position as *maître de*

1. "Interview of Bryce DeWitt and Cecile DeWitt-Morette by Kenneth W. Ford on 1995 February 28", Niels Bohr Library & Archives, American Institute of Physics, College Park, MD, at www.aip.org/history-programs/niels-bohr-library/oral-histories/23199. The "Bohr and Wheeler paper" is Niels BOHR and John A. WHEELER, "The mechanism of nuclear fission", *Physical Review*, 56, 1939, pp. 426-450.

2. Neasa MCGARRIGLE, "The establishment of the Dublin Institute for Advanced Studies, 1936-1948", PhD thesis, Trinity College Dublin, 2017.

3. *Ibid.*, p. 222, estimates that the School of Theoretical Physics was in contact "with hundreds of individuals in at least thirty-five countries".

4. On Morette's relationship with her Chinese colleagues see Nicolette MORETTE, "For love and physics", *Physics Today*, 72, June 2019, pp. 11-12.

conférences awaited her at the University of Nancy, starting in September 1950. But in the weeks that followed this professional proposition, the American physicist Bryce DeWitt, then a postdoc at the IAS, put forward another kind of proposal. While they were having supper after a day of canoeing, he asked for her hand in marriage. After a night of reflection, she accepted. This meant that, unlike most of her French comrades who benefited from an early international training, and in accordance with the gendered norms of her time and class, Morette chose to stay abroad and pursued a career in the US: as she told Nicolas Constans in 2009, “in those times, wives followed their husbands”¹. The couple managed to secure employment at the University of California at Berkeley in 1952, after a year as research associates at the Tata Institute of Fundamental Research in Bombay. In 1956, they joined the University of North Carolina at Chapel Hill, then, in 1972, the University of Texas at Austin². This American career was, however, supplemented by a French career, allowing Cécile Morette to keep one foot on each side of the Atlantic Ocean. She remained on the CNRS rolls until 1965, before becoming professor at the University of Grenoble. The birth of the Les Houches school was the major concrete consequence of this twofold international career. In order to contribute to the reconstruction of French research, and as a “self-imposed condition for marrying a foreigner”, Morette conceived the project of establishing a summer course³. The idea was to select a number of French and foreign professors and students who would be gathered for a short amount of time (ideally eight weeks), in an isolated place, in order to foster intense face-to-face interactions – deemed far more effective in knowledge circulation and science training than the deployment of what Latour later came to name “immutable mobiles”⁴. Two sources of inspiration can be detected: first, the Ann Arbor summer symposium that

1. Nicolas CONSTANS, “Entretien avec Cécile Morette, 20 mai 2009”. On the social complexities of being two scientists in a couple, especially when the “two-body problem” is an everlasting issue, and the fact that the women in such partnerships have historically borne the brunt of society’s asymmetric evaluation of gender, see Helena PYCIOR, Nancy SLACK and PNINA ABIR-AM (eds.), *Creative Couples in the Sciences*, New Brunswick, NJ: Rutgers University Press, 1996; Annette LYKKNES, Donald L. OPITZ and Brigitte VAN TIGGELEN (eds.), *For Better or for Worse? Collaborative Couples in the Sciences*, Basel: Birkhäuser, 2012.

2. On the difficulties encountered to secure a full position for Morette, due to rules aimed at nepotism, see Bryce DEWITT, “Cécile DeWitt-Morette (1922-)”, in Nina BYERS and Gary WILLIAMS (eds.), *Out of the Shadows: Contributions of Twentieth-Century Women to Physics*, Cambridge: Cambridge University Press, 2006, pp. 324-333.

3. Cécile MORETTE, “1948-1950: snapshots”, *IAS: The Institute Letter*, spring 2011, pp. 10-11, p. 10.

4. Bruno LATOUR, *Science in Action: How to Follow Scientists and Engineers through Society*, Cambridge, MA: Harvard University Press, 1987.

Morette attended in 1949, at the University of Michigan – which was, however, very different, as it was more formal and organized around only one professor, Richard Feynman; and second, her strongly committed membership of the Girl Scouts, which ended only with her departure to Ireland. If the Guides ethos was far from being science-oriented, its effectiveness for skills acquisition, sociability strengthening and network building was impressive.

The project came to fruition surprisingly quickly. Through a blitz campaign in several well-chosen Parisian offices during the 1950-1951 winter, Morette secured the support of major figures, as she “convinced the divas to sing in the rain”¹. These included Pierre Auger, director of the Natural Sciences Department at UNESCO; Gaston Dupouy, director of CNRS; Albert Châtelet, dean of the Paris faculty of science; and above all Pierre Donzelot, *directeur de l’enseignement supérieur* and as such administrative head of the whole higher education infrastructure. All contributed their support, even if only by lending their name. Donzelot proved to be the most tangible supporter of Morette’s project, as he funded the school with 3.5 million francs in 1951, then four million annually from 1952 to 1957². Auger, who had far fewer financial resources at his disposal, opened his address book for her, and invited her to the Geneva conference of the Centre européen de la culture (12 December 1950), a crucial social meeting for the “fusion of the initiatives” that led to the creation of the European Council for Nuclear Research (CERN)³. Her project goals are clarified in a document, written in November 1950, for the CNRS:

Theoretical physics teaching is, in general, insufficient. In those conditions it would be advisable to provide to French and foreign students and junior researchers, during the summer, a basic education course allowing them to tackle the problems of modern theoretical physics. The courses, roughly of a couple months’ length, would be simultaneously simple, modern and intensive, with a syllabus designed to allow the less experienced to attend class profitably and the more experienced to be interested by a very new presentation of problems which they know only partially [...].

1. Pierre-Gilles DE GENNES, “Le regard de Cécile”, in François DAVID (ed.), *Pour Cécile. Livre d’or. École des Houches. Cinquantième anniversaire (1951-2001)*, 2001, p. 36.

2. “Rapport concernant la subvention de fonctionnement nécessaire à l’École d’été de physique théorique”, 18 August 1961, Cécile DeWitt-Morette Papers, Archives of American Mathematics, Dolph Briscoe Center for American History, University of Texas at Austin (subsequently CDWMP), 2015-248/1.

3. Armin HERMANN, Lanfranco BELLONI, John KRIGE, Ulrike MERSITS and Dominique PESTRE, *History of CERN, I, vol. 1: Launching the European Organization for Nuclear Research*, Amsterdam: North Holland, 1987, pp. 112, 120.

The summer period would allow us to benefit from the presence of foreign professors in France, who would accept to contribute to the school while enjoying a residence in a picturesque region. On another note, it would allow us to gather students who are far-flung, and still too few to justify the creation of several research centres.

Experience of schools of this kind in the United States shows their appeal, and the service they can provide to scientific research. Such a school in Europe would furthermore contribute, on a scientific level, to international cooperation and to French prestige¹.

With this project, Morette simultaneously addressed many concerns of those French scientific leaders. Auger and Dupouy (physicists), Donzelot (a physico-chemist) and many others of their peers felt that French science had been in a relatively mediocre state for at least the previous decade; only international cooperation was deemed to offer a way to emerge from this critical situation, and to catch up with the world leaders. But this operation had to be carried out with the least amount of new legislation possible in order to circumvent the inertia of the political circles of the Fourth Republic, to be accomplished at the lowest cost possible in order to ward off the Finance Ministry's wrath, and without any diplomatic commitment that might have been frowned upon by the Ministry of Foreign Affairs, in a time of Cold War². In their eyes, Morette's school was a lowcost, low-risk, high-reward way to "modernize" French science, alongside much more ambitious and onerous endeavours, such as the difficult birth of the supranational laboratory that was to become CERN, the quinquennial plan of the CNRS, or the reorganization of the Commissariat à l'énergie atomique (CEA) after the eviction of its first high commissioner, the communist Joliot, on 28 April 1950. Best of all, the risk of creating a brain drain was limited within Morette's plan, as, within its terms, French students would stay in France.

The support of scientific leaders secured, a location remained to be found. Morette investigated several hotel establishments, trying to bring her school into being near one of the high-altitude laboratories, especially the ones devoted to cosmic rays at L'Argentière and the Aiguille du Midi. These were property of the *École polytechnique*, and led by her friend Louis Leprince-Ringuet³. However, such an

1. Cécile MORETTE, "Physique théorique: Projet de création d'une école d'été", November 1950, Archives nationales (subsequently AN), 19800284/101.

2. For a synthesis of the rocky relationship between France and the United States during this period, see Frank COSTIGLIOLA, *France and the United States: The Cold Alliance since World War II*, New York: Twayne of G. K. Hall, 1992.

3. Cécile Morette to Société des hôtels de montagne, 26 June 1950, Archives de l'École de

option proved to be too costly, and she feared that a hotel could not provide the desired socializing opportunities among participants, while subjecting them to too many distractions and external solicitations. The Ministry of Education offered to make the Briançon *lycée* available, but it was deemed not isolated enough¹. Morette finally settled on several chalets (with no facilities) owned by the father of Arlette, her dearest friend from the Girl Scouts – the architect Albert Laprade, who, for the sake of friendship, offered a very cheap rent. The school was therefore founded in an old and rustic farm (Figure 1), surrounded by small *mazots* (traditional wooden shacks), in a forty-hectare property at the Côte des Chavants – immediately dubbed “Côte des Savants”- in front of Mont Blanc, four kilometres away from the alpine village of Les Houches². The school was officially created on 18 April 1951, just one week before Cécile and Bryce married.

2 Cécile Morette, theoretical physicist and entrepreneur extraordinaire

How could a twenty-nine-year-old woman manage to found such a school, within an academic system renowned for the weight of its administrative rules and hierarchical social structure?³ This success can only be explained through a careful study of her biographical trajectory, highlighting the extremely uncommon combination of circumstances and social resources held and strategically mobilized by Cécile Morette. First of all, one must bear in mind that Morette could be described, in a manner of speaking, as the adoptive daughter of the whole Corps des mines – the foremost technical *grand corps* of the French state, then all-male, characterized by its extremely strong elitism, *esprit de corps* and adherence to a Saint-Simonian ideal⁴. Born on

physique théorique des Houches (subsequently AEPHT).

1. Cécile Morette to proviseur du lycée de Briançon, 13 February 1951, AEPHT.

2. “École d’été de physique théorique”, *Atomes*, 68, 1951, pp. 391-392.

3. Christophe CHARLE, *La république des universitaires*, Paris: Le Seuil, 1994; Pierre BOURDIEU, *Homo Academicus*, Stanford, CA: Stanford University Press, 1998; Harry PAUL, *From Knowledge to Power: The Rise of the Science Empire in France, 1860-1939*, Cambridge: Cambridge University Press, 1985.

4. To enter the Corps des mines, one must first be accepted at the École polytechnique (the most selective *grande école*, with the ENS), then be ranked one of the five or six best among a class of usually two hundred students, then follow advanced training at the ENSMP. See Anne-Françoise GARÇON et Bruno BELHOSTE (eds.), *Les ingénieurs des Mines: Cultures, pouvoirs, pratiques*, Paris: IGPDE, 2012; Bruno BELHOSTE, *La formation d’une technocratie: L’École polytechnique et ses*

21 December 1922, within the very walls of the *École nationale supérieure des mines de Paris* (ENSMP), a school that united her father and her mother's trajectories, she was born into a proximity with science and affiliation with the ruling classes of highest-level civil service and industry. Her apparent father, André Morette, *polytechnicien* (graduate of the *École polytechnique*), son of a *polytechnicien*, chief engineer at the *Corps des mines*, was at the time temporary lecturer at his second alma mater¹. His main post was professor of metallurgy at the *École des mines de Saint-Étienne*, but in 1923 he asked for a leave of absence and became director general of the *Société métallurgique de Normandie* (SMN)². His wife, Marie-Louise Morette, née Ravaudet, daughter of the secretary of the ENSMP, was a licensed mathematics teacher, although she did not continue in this profession. After the death of André Morette in 1931, she married Maurice Payen, a civil engineer of mines and the successor of her late husband as director of the SMN. Bearing further testimony to the strength of the ties uniting the members of this social sphere, one may note that the two brothers of Cécile, Jacques and François, became *inspecteurs des finances*³. The episode of the Atlantic crossing of 1948, as narrated by Cécile Morette, gives an idea of the family atmosphere, and the strength of the *Corps des mines* network:

I came by ship, travelling first class, my stepfather having upgraded my CNRS travel allowance. He wanted to be sure that my travelling companions would meet his approval; he came on board the ship to choose my assigned table. It turned out to be a table of Dominican Fathers, but I was sick most of the time and hardly met them. As for meeting eligible young men, he had arranged for Bernard Gregory, then a graduate student at MIT [and a member of the *Corps des mines*], later to become *directeur général* of CERN, to look after me. He did. He came to Princeton to be my escort at the Institute's 1949 Spring Dance⁴.

élèves de la Révolution au Second Empire, Paris: Belin, 2003.

1. During the 1970s, Morette learned that her biological father was in fact Raphaël Pecker, a Jewish doctor who was killed at Auschwitz. See Toni FEDER, "Snapshots...", *op. cit.*

2. "André Pierre Ernest Morette (1879-1931)", at www.annales.org/archives/x/Morette.html.

3. Nathalie CARRÉ DE MALBERG, *Le grand état-major financier: Les inspecteurs des Finances, 1918-1946*, Paris: IGPDE, 2011.

4. Cécile MORETTE, "1948-1950: snapshots", *op. cit.*, p. 10. On Bernard Gregory see Louis LEPRINCE-RINGUET, "Biographie de Bernard Gregory (X 1938)", *La jaune et la rouge*, 330, 1978, pp. 24-25.

Figure 1: Discussions during the first session of the Les Houches school (1951)



Archives de l'École de physique théorique des Houches, reproduced by kind permission of the École de physique des Houches.

The allied bombing of Caen put a dramatic end to this bourgeois upbringing. On 6 June 1944 the twenty-two-year-old Cécile Morette brutally lost her mother, her grandmother, one of her sisters and the family housemaid. Such a tremendous biographical shock altered the course of her life and completely changed the use to which she put her educational capital. Instead of becoming an intellectual ornament as a wife to a brilliant Corps des mines engineer, in accordance with the expectations of her social milieu, she used her freshly acquired DES (28 April 1944) to launch a professional career. Reporter Emily Mitchell recorded Morette's recollections of this time in the year 2000:

After high school [...] her mother suggested she study mathematics in college – treating it, DeWitt-Morette says, like a finishing school, “for cultural purposes and logical thinking” [...] She was in the midst of an exam in Paris when tragedy struck [...] “I now felt in charge of my family”, she says, “so I thought I had better get a job”. At 22, she no longer felt young¹

The mathematician Maurice Janet, her professor at the University of Caen, who had just been appointed to the Sorbonne, recommended that she present herself to Joliot, as he knew that the physicist of the Collège de France was looking for a “house theorist”. Her acceptance precipitated a rather abrupt change of environment: the young bourgeois woman, Catholic and theory-driven, was introduced to a laboratory where communists and experimenters were in clear majority.

This incongruity, it seems, honed Morette’s skills as a scientific diplomat. Her combination of class and gender, her simultaneously feminine and grand bourgeois social dispositions, proved to be especially effective for resource gathering and institution building, as it was characterized by strong self-control, discreet confidence and mastery of social etiquette². Without delving too much in counterfactual history, it is very likely that it was the loss of almost all her family that caused her to deviate from a trajectory close to that of the equally well-bred Laura Fermi or Ava Helen Pauling, for example, socialite wives of high-profile scientists who played major roles as go-betweens in the international physics community – without maintaining a professional career of their own³. In a word, the tact and diplomacy instilled in a quasi-Proustian *jeune fille* made Morette a master tactician in the academic world, allowing her to cross the political boundaries that shaped the first years of the Cold War. As Mitchell wrote, paraphrasing Morette herself,

1. Emily MITCHELL, “Senior women Web interviews: Cécile DeWitt-Morett”, 2000, at www.seniorwomen.com/articles/articlesIntCecile.html.

2. On the social dispositions of the French bourgeoisie see Béatrix LE WITA, *French Bourgeois Culture*, Cambridge: Cambridge University Press, 1994 (the study took place during the 1980s, but the interviewees very often evoke the interwar period); Éric MENSION-RIGAU, *Aristocrates et grands bourgeois*, Paris: Perrin, 2007; Michel PINÇON and Monique PINÇON-CHARLOT, *Voyage en grande bourgeoisie*, Paris: PUF, 2005. For a comparable (if masculine) case see Mary Jo NYE, “Aristocratic culture and the pursuit of science: the De Broglies in modern France”, *Isis*, 88 (3), 1997, pp. 397-421.

3. Ruth GRODZINS, “Laura Fermi, 1907-1977”, *Bulletin of the Atomic Scientists*, 34, 1978, pp. 2-3; Laura FERMI, *Atoms in the Family: My Life with Enrico Fermi*, Chicago: The University of Chicago Press, 1954; Mina Julia CARSON, *Ava Helen Pauling: Partner, Activist, Visionary*, Corvallis: Oregon State University Press, 2013; Olivia Leontine MAY, “Wife of scientist: the gender, science and political identity of Ava Helen Pauling”, honors thesis, Wesleyan University, 2014.

Cécile knows exactly when to complain, when to demand, when to agree, and how to express any of these actions, in speech or in writing [...]. To gain support from male colleagues for Les Houches, DeWitt-Morette made them think the proposal was their own. She would describe the plan to them and then phone a week later to say, “Oh, that idea you told me about was great!” Remembering those days now, she says with a laugh, “I was an intellectual geisha!”¹.

Those interpersonal skills and discreet leadership would be nothing without Cécile Morette’s obstinacy, and her ability to get her foot in the door with a smile. Pierre Auger, strongly impressed by her forcefulness, blurted, “*elle emmerdera la terre entière, mais elle l’aura!*”² Her persistence was reinforced by a strong sense of duty inherited from her upbringing, intertwined with deep-rooted patriotism:

Bryce DeWitt proposed to her. Her first reaction? That same evening, she refused. There was no question of moving to the United States for someone who felt as indebted to her country [...]. Yet, she would like to marry Bryce. The next morning, she found a solution in a matter of minutes, while brushing her teeth. This solution was the Les Houches school³.

With such dispositions, not only was Morette able to gather the support of the major institutional luminaries of science, such as Auger, Donzelot, Dupouy or Châtelet, but she also benefited from an active propaganda effort initiated by older and more powerful professors. Yves Rocard at the ENS widely circulated the newsletter of the school through the paper *E.N.S. physique*, and sent his most promising students to the summer school, as did Louis Leprince-Ringuet of the École polytechnique. Francis Perrin, at the Collège de France and the CEA, provided some office space to install a Parisian secretariat for the school⁴. Louis de Broglie and Alexandre Proca,

1. Emily MITCHELL, *op. cit.*

2. Cécile MORETTE, “1948-1950: snapshots”, *op. cit.*, p. 10. Auger’s expression could be roughly translated as “she will annoy the entire Earth, but she will get it!” but the crudeness of the French expression remains untranslatable for this author. If needed, this quote clearly shows that Morette’s persuasive power wasn’t grounded in seduction.

3. Marie-Laure THÉODULE, *op. cit.*, p. 24-25.

4. On Rocard and the major role played by the ENS in French post-war physics see Dominique PESTRE, “La création d’un nouvel univers physicien: Yves Rocard et le laboratoire de physique de l’École normale supérieure, 1938-1960”, in Jean-François SIRINELLI (ed.), *École normale supérieure: Le livre du bicentenaire*, Paris: PUF, 1994, pp. 405-422; Pierre VERSCHUEREN, “La science comme vocation? Les élèves scientifiques de l’École normale supérieure et l’espace de leurs carrières (1944-1962)”, *Histoire de l’éducation*, 144, 2015, pp. 79-103. On the École polytechnique see Bruno BELHOSTE, Amy DAHAN and Antoine PICON (eds.), *La formation polytechnicienne, 1794-1994*, Paris: Dunod, 1995.

at the Institut Henri Poincaré, lobbied actively, especially in CNRS circles, to ensure that young researchers would be aware of the endeavour and be encouraged to go. Louis Néel was instrumental in obtaining for the Les Houches school the patronage of the Grenoble faculty of sciences, allowing the school to be, legally, an institute of the University of Grenoble. In doing so, he secured its institutional existence, academic legitimacy and freedom of action, as the university was a far more distant master than the faculty of sciences would have been¹. The fact that Morette managed to align such rivals can only be explained by her interpersonal skills, supported by the dual patronage of Louis de Broglie and Frédéric Joliot, two powerful academics on opposite sides of the French academic field – the first was a right-wing aristocrat, university professor and theoretician, while the latter was a communist from humble origins, a professor at the Collège de France, and an experimentalist. If those two universally respected physicists were nevertheless institutionally marginalized after 1950, Morette built an extended network on their support. She succeeded in enrolling men as politically diverse as Dupouy, socialist of the southern type (and close friend of the president Vincent Auriol), the old-school intellectual socialists Auger and Perrin (inheritors of the *dreyfusard* generation of Perrin père), the even older-school radical Châtelet, the Catholic and conservative Leprince-Ringuet, the staunchly apolitical Néel, and the unclassifiable “anarcho-Gaullist” Rocard. Morette was therefore in a position to bring together the various barons of the higher education and research world, in France as in the rest of the world. Furthermore, as British nurses were common in her milieu during the interwar years, Morette perfectly mastered the English language, a powerful tool in a then largely monolingual French academic landscape. Combined with her internationalized trajectory, her linguistic skills allowed her to play the role of a go-between, connecting separate networks and gathering symbolic, social and economic resources at both international and national levels. For example, in the November 1950 project, Morette openly supplemented the appeal to national interest with the evocation of the support of Oppenheimer; Enrico Fermi, professor at Chicago University and Nobel Prize-winner of 1938; Julian Schwinger, professor at Harvard; and Victor Weisskopf, professor at MIT. In this way, she combined the national institutional legitimacy acquired in various bureaucratic,

1. Louis NÉEL, *Un siècle de physique*, Paris: Odile Jacob, 1991, pp. 225, 271-272; Archives départementales de l’Isère, 20/T/511; Dominique PESTRE, *Louis Néel et le magnétisme à Grenoble: Récit de la création d’un empire physicien dans la province française 1940-1965*, Paris: Cahiers pour l’histoire du CNRS, 1990.

academic and political spaces with the international scientific legitimacy provided by such renowned physicists¹.

The effects of Morette’s social dispositions were compounded by her impressive social capital, exceeding by far the boundaries of the academic field, acquired through the Corps des mines and various Catholic networks, the Girl Scouts being only the most prominent. She wrote articles of science popularization for the Dominican review *La vie intellectuelle*, an example of her reach beyond the specialist sphere. Her correspondence shows that she was personally close to people as diverse as Jean Gommy, president of the board of directors of the Société des hôtels de montagne; the high-flying diplomat François de Rose, directly involved in the creation of CERN, who gave crucial advice on which institution to approach; the captain of industry and science lover Léon Motchane; and of course Albert Laprade himself². Furthermore, one can make the hypothesis that this Catholic grounding helped her, combined of course with her marriage, to reassure many American interlocutors and to convince them of the innocuousness of her project, as the US was then wary of the Parti communiste’s strength and tried to stifle France’s nuclear ambition³.

3 The “heroic years”

Thanks to her exceptional trajectory and her specific social dispositions, Morette became an effective academic entrepreneur, gathering funding and finding premises in a matter of months, and attracting for the first session, in July-August 1951, a wide array of scientists.

Each session was intended to review the state of knowledge in a precise area of physics, by means of a strongly internationalized teaching (and student) body (Table 1). From the first session, several well-established young professors attended, the oldest being fifty years old. It was by no means Morette’s least feat to have got the support of the oldest, most powerful professors, while managing to prevent their direct interference. On the French side, one can cite Pierre Grivet, Alfred Kastler and Théo Kahan as young professors in attendance; for the other scientists, we could underline the presence of, naturally, Walter Heitler, then at Zurich; Léon van Hove,

1. Cécile MORETTE, “Physique théorique...”, *op. cit.*

2. Cécile Morette to François de Rose, 27 June 1950, AEPHT.

3. On the geopolitics behind US-French scientific collaborations in the nuclear sciences see John KRIGE, *Sharing Knowledge, Shaping Europe*, Cambridge, MA: MIT Press, 2016.

Table 1: Country of origin of the attendees of the Les Houches summer school (1951-1967).

| Country | Professors | | Students | |
|----------------|------------|------|----------|------|
| | No. | % | No. | % |
| France | 53 | 26.5 | 250 | 44.2 |
| United States | 89 | 44.5 | 41 | 7.2 |
| United Kingdom | 14 | 7.0 | 27 | 4.8 |
| Switzerland | 12 | 6.0 | 5 | 0.9 |
| Denmark | 6 | 3.0 | 2 | 0.4 |
| Netherlands | 6 | 3.0 | 15 | 2.7 |
| Italy | 4 | 2.0 | 38 | 6.7 |
| Belgium | 2 | 1.0 | 28 | 4.9 |
| Sweden | 2 | 1.0 | 19 | 3.4 |
| Germany | 1 | 0.5 | 18 | 3.2 |
| Poland | | | 19 | 3.4 |
| Other | 11 | 5.5 | 104 | 18.4 |
| Total | 200 | 100 | 566 | 100 |

Source : UNIVERSITÉ DE GRENOBLE, *École d’été de physique théorique. Les Houches. Rapport d’activités 1951-1966*, 1967.

from the Université libre de Bruxelles; Emilio Segrè, from Berkeley; Walter Kohn, of the Carnegie Institute of Technology; and the Nobel Prize-winner of 1945 Wolfgang Pauli, from Zurich – and, for a few days only, his 1938 *confrère*, Enrico Fermi. These endorsements provided an impressive start-up: the first session attracted two hundred applicants, for only thirty-five student positions¹. Instrumental in the pedagogical efficiency of the school was the fact that it was what Muriel Darmon would call an “enveloping institution”, in the sense that it had some (but not all) characteristics of a Goffmanian “total institution”. It was both a place of work and a residence for a number of similarly situated people, cut off from the wider community, “leading an enclosed round of life”. The major differences were, of course, that the timescale was far shorter and the administrative coercion far lighter than in most classic examples of such institutions, such as mental hospitals and boarding schools².

1. Cécile Morette to Pierre Donzelot, 24 March 1951, AEPHT.

2. Muriel DARMON, *Classes préparatoires: La fabrique d’une jeunesse dominante*, Paris: La Découverte, 2013; Muriel DARMON, “Drafting the ‘time space’: Attitudes towards time among prep school students”, *European Societies*, 20 (3), 2018, pp. 525-548; Erving GOFFMAN, *Asylums: Essays on the Social Situation of Mental Patients and Other Inmates*, New York: Anchor Books, 1961,

At Les Houches the attendees were nearly cut off from the outside world, with the bare minimum in amenities before the early 1960s (especially for students). The classes took place in the morning, mostly in English, at the rate of two classes every day, six days a week; some non-recurring seminars were organized, for professors who could not stay the whole session. The afternoon was left free, dedicated to face-to-face discussions between professors and students trying to understand what had been said in the morning, often while mountaineering. The lectures, systematically prepared and written in advance, were widely circulated as proceedings after the session¹. The certificate awarded by the school to those who requested it was marked by this demanding conviviality. For the first part of the examination, the student had to choose one question among four, determined by the whole teaching body; they had to answer it within two days, using the little school library, every document available and every discussion they might have had. The second part of the examination comprised a verbal discussion of an hour or two, with one of the professors². Claude Cohen-Tannoudji, a student in 1955, recalled in 2001,

It was extremely spartan [...] We were lodged in small wooden chalets, barely furnished. The classroom was an old chalet slightly below. We sat on canvas chairs, the chalkboard was primitive, discussions happened outside, on the pastures. It was rough, but at the same time very charming, very *bonne franquette*, an extremely pleasant atmosphere³.

This atmosphere of scientific camaraderie and emulation was extremely effective, generating a powerful sense of belonging, almost an *esprit de corps*⁴. From this point of view, we could compare the Les Houches school to the “hot spots and hot moments” in scientific collaborations studied by John N. Parker and Edward J. Hackett: as the

pp. xxi.

1. Cécile MORETTE and Marie-Simone DETEUF, “L’École des Houches”, *Revue de l’enseignement supérieur*, 2, 1960, pp. 175-178. The 1951-1957 lectures can be found at www.lpthe.jussieu.fr/~leticia/leshouchesbooks.html.

2. UNIVERSITÉ DE GRENOBLE, *École d’été de physique théorique: Les Houches*, 1954, Annex B.

3. *Archimède* television show, chaîne Arte, 30 October 2001.

4. Many examples of the fidelity of the school’s alumni can be found in François DAVID, *op. cit.* There is no denying that something exists like a Les Houches mythology, consciously built by Morette herself; François David’s book, edited for the fiftieth birthday of the school, may be considered its legendarium. But such a topic is beyond the scope of this paper: I will limit myself to pointing out that many analyses developed by Pnina Abir-Am about the collective memory of science could be transposed to this case. See Pnina ABIR-AM, *Commemorative Practices in Science: Historical Perspectives on the Politics of Collective Memory*, Chicago: The University of Chicago Press, 2000.

two sociologists underline, brief but intense periods of collaboration undertaken in isolated settings facilitate the rapid production of highly creative science and help overcome scepticism by outsiders¹. By generating a coherent social group, oriented toward common intellectual goals, the pedagogical efficiency of direct intellectual exchange can be multiplied – especially when what is at stake is the transmission of ways of thinking, and of tacit knowledge². According to Philippe Nozière, a student in 1953 before becoming deputy director of the school after his doctoral studies at Princeton, “we learned in two months what we would have learned in two years in an American university”³. Furthermore, the internationalism flourishing in this endeavour fed on itself, by giving young researchers a leg-up to access the world stage. The *polytechnicien* (and Corps des mines engineer) Cyrano de Dominicis, for example, participated as a student in 1953; at Les Houches, he met Rudolf Peierls, who convinced him to undertake a doctorate under his supervision, at the University of Birmingham, from 1954 to 1957. Enrolment was highly selective: the number of applications constantly exceeded by more than three times the number of available student places. The selection was operated by a select committee (de facto mainly by Morette) on the basis of recommendations, courses taken, personal work completed – diplomas being only one of a number of elements⁴. Nevertheless, between 1951 and 1967, among the 250 French students, seventy-three (nearly 30 per cent) were students of the ENS, a *grande école* characterized by its intensive research training. Among the non-*normaliens* and non-*polytechniciens*, the majority were entry-level CNRS researchers already holding a doctorate, and sometimes physicists even more advanced in their career. The best example was Anatole Abragam, who taught at the school in 1955, 1961 and 1964, but decided to come back in 1965 as a 50-year-old student, in order to follow a special course dedicated to the theory of elementary particles directed towards experimenters. Abragam had recently been entrusted to direct the whole department of physics at the Saclay Centre d’études nucléaires (the main research complex of the CEA), but did not know particle physics as well as he would have liked; he felt that Les Houches was the most effective way to quickly

1. John N. PARKER and Edward J. HACKETT, “Hot spots and hot moments in scientific collaborations and social movements”, *American Sociological Review*, 77 (1), 2012, pp. 21-44.

2. On how tacit knowledge shapes theoretical physics practice see Luis REYES-GALINDO, “The sociology of theoretical physics”, PhD thesis, Cardiff University, 2011, pp. 159-205.

3. *Archimède*, *op. cit.*

4. See the application form in UNIVERSITÉ DE GRENOBLE, *École d’été de physique théorique: Les Houches*, 1954.

and accurately get a grasp on the science he would be directing¹. This selectivity of the school's recruitment was not reserved to French students; among the forty-one American students, no less than fifteen came from an Ivy League university, and among the twenty-two British students, nine were from Cambridge University – and, like Abragam, Bryce DeWitt himself, a teacher at Les Houches in 1953, 1956 and 1963, came as a student in 1958.

This selectivity ensured the school's attractiveness for the professors themselves, even if their stipend remained modest. One can quote Léon Rosenfeld, a Belgian physicist then professor at the University of Manchester who, back home after the second session, wrote in a letter to Morette,

Yesterday afternoon, several students submitted me to so close an examination with their questions about my lectures that my departure has been somewhat precipitated, as time went by much faster than I would have thought [...]. I rarely worked in such a sympathetic atmosphere, and moreover I rarely provided such intense intellectual work without feeling any fatigue; on the contrary, I found at Les Houches both the stimulation of an elite audience and the tranquillity necessary for the concentration on a given subject².

Consequently, attending Les Houches was correlated with subsequent career success for its students and staff, especially during the first part of its existence. Of ninety-three different professors attending between 1951 and 1961, twenty-one were or became Nobel Prize-winners, and among 346 students during the same period, three obtained the same prize, and fifteen became members of the Académie des sciences. In France, the shortcomings of the university curricula that justified the creation of the school were mitigated as its alumni became fully fledged academics: as early as 1963, of the ninety-three French students of the 1951-1957 sessions, at least twenty-two were already *maîtres de conférences*, and nine full professors³. Thus, at that time, fifteen out of the eighteen French universities had at least one permanent teacher who had benefited from at least one summer school session (the only exceptions being Dijon, Nancy and Poitiers)⁴. This fact led to a change in pedagogical policy: while

1. Anatole ABRAGAM, *De la physique avant toutes choses*, Paris: Odile Jacob, 2000, p. 259.

2. Léon Rosenfeld to Cécile Morette, 3 September 1952, AEPTh.

3. Calculated with *Enseignement supérieur. Facultés des sciences. Tableaux de classement du personnel enseignant au 31 décembre 1962*, Paris: Ministère de l'éducation nationale, 1963.

4. It must be noted that Morette never hesitated to intervene directly with Donzelot, and his successor Gaston Berger, in order to assure the career of her protégés. See, for example, Cécile Morette to Pierre Donzelot, 18 August 1952, CDWMP, 2015-248/1.

Table 2: Subjects at the Les Houches summer school sessions (1951-1967).

| Year | Subject(s) |
|------|---|
| 1951 | Quantum mechanics, quantum field theory, theory of solid state |
| 1952 | Quantum mechanics, statistical physics, nuclear physics |
| 1953 | Quantum mechanics, solid-state physics, statistical physics, elementary particles, magnetic resonance |
| 1954 | Quantum mechanics, theory of collisions, quantum electrodynamics |
| 1955 | Quantum mechanics, non-equilibrium phenomena, nuclear reactions, interaction of a nucleus with atomic and molecular fields |
| 1956 | Theory of low-temperature physics, quantum theory of solids, dislocations and plastic properties of crystals, spin wave theory of magnetism, ferromagnetism |
| 1957 | Scattering theory, elementary particles, pion-nucleon interactions, high-energy physics, strange particles |
| 1958 | Many-body problem |
| 1959 | Theory of neutral and ionized gases |
| 1960 | Dispersion relations and elementary particles |
| 1961 | Low-temperature physics |
| 1962 | Geophysics, the Earth's environment |
| 1963 | Relativity, groups and topology |

Source : Université de Grenoble, *École d'été de physique théorique, Les Houches, Rapport d'activités 1951-1966*, 1967.

the first sessions (Table 2) were focused on teaching the main aspects of quantum theory (very broadly understood, as it encompassed field theory, nuclear physics and condensed-matter physics), after 1958 the school diversified its activities, setting more specialized sessions.

Such success, evident from the outset, quickly attracted new financial backers¹. Among the major sources of support, we can cite the CEA, from as early as 1952; the Fulbright programme from 1953 (this reserved two scholarships each year to finance the presence of American lecturers); the Ford Foundation from 1956; and the North Atlantic Treaty Organization (NATO) from 1959². Other institutions helped fund

1. UNIVERSITÉ DE GRENOBLE, *École d'été de physique théorique. Les Houches. Rapport d'activités 1951-1966*, 1967, for a full list.

2. About the support provided by the Fulbright programme see the reports kept in University of Arkansas Libraries, Bureau of Educational and Cultural Affairs Historical Collection, Group 3, Series 3, Boxes 118, 125A-E. For the Ford Foundation see "Proposal to the Ford Foundation.

the attendance of their nationals, such as the Belgian Institut interuniversitaire des sciences nucléaires, the Swedish Statens råd för atomforskning, and the Norwegian Norges almenvitenskapelige forskningsråd. With regard to these funders, the school seems to have maintained a policy of independence: physicists hailing from the Eastern Bloc, if never great in number, were nevertheless always present from the second session onwards. Students from Yugoslavia attended from 1952 onwards, from Poland beginning in 1956, from Hungary beginning in 1957, from Romania beginning in 1958, and from the USSR beginning in 1961. Professors from the Soviet Union taught at the school from 1958 onwards, starting with Spartak Belyaev and Vilen Strutinsky. With this kind of support the school quickly expanded and institutionalized, while remaining nearly cost-free for students. The management of the school became so demanding that Cécile Morette was forced to recruit deputies, first Jean-François Detœuf, then Philippe Nozières, before it became too hard for her to continue leading across the Atlantic Ocean: Roger Balian succeeded her as head of the school in 1972.

This institutional growth can be retraced locally, via the physical growth of the school. Morette bought the chalet called “Le Chardonnet” in April 1955 as a permanent dwelling. The school still had to lease several chalets, but its continuation was now much more assured. In October 1960 the site’s biggest chalet, “Les Balmes”, was purchased and turned into a restaurant, while a smaller one, “La Chavanne”, was acquired to increase the number of lodgings, along with the storehouses “du Rocher” and “de Babette”. In 1961 and 1964, the school bought several plots of land, in order to fill the gaps; the institution was no longer a tenant, but an owner. The most important building, “La Jacassière”, providing a classroom, some study rooms, a library and some offices, was built on this land from 1961, and inaugurated for use in March 1965¹. This building symbolized a new school, with a degree of comfort, departing from the “boy scout camp” flavour of what Morette called the “heroic years”². Such an upgrade was made inevitable for two reasons: with the sessions’ specialization, the school recruited more advanced students, with families in tow. Moreover, the birth of competing and more luxurious summer schools threatened

Assistance to the French summer school of physics of the University of Grenoble at Les Houches, for the summer 1958”, AN, F/17/17583.

1. “Université de Grenoble. École d’été de physique théorique. Patrimoine de l’Université de Grenoble, pour le compte et à l’usage de l’école d’été de physique théorique”, 1978, AEPTh.

2. Cécile MORETTE, “Les leçons à tirer de l’époque héroïque”, 5 April 1993, AEPTh.

Les Houches’s ability to attract the most outstanding professors, especially as it offered only a modest remuneration¹.

4 Spin-offs

During the 1950s and 1960s, the Les Houches School of Physics had a considerable impact on the development of top-level physics in France and Europe. Beyond the individual achievements of its alumni, what is especially striking is the rapid proliferation of similar endeavours, evidence of Morette’s success. As early as 1953, the Milanese professor Giovanni Polvani, with the strong support of Giampetro Puppi, Enrico Fermi and the Società italiana di fisica, founded the Scuola internazionale di fisica, in Varenna, Italy, whose main purpose was to be an experimental counterpart to the Les Houches school and its strongly theoretical mindset². In July 1958, another summer school in theoretical physics was created in Cargèse, Corsica, by Maurice Lévy and Yves Rocard. Openly designed as a “Les Houches on the beach”, this Cargèse school was for quite a long time as rustic and isolated as its Alpine counterpart, maybe even more so; the idea hatched when Lévy, teaching at Les Houches in 1957, considered “too irrepressible the temptations to escape to Chamonix”³. What really kick-started the generalization of the summer school model was the creation of the advanced-study institute programme by NATO in 1958, initiated by the former Les Houches professor Norman F. Ramsey⁴. After the 1957 “sputnik shock”, NATO was looking for a way to accelerate and shape the reconstruction of European physics, in order to secure the cooperation of often reluctant allies and produce a scientific order consonant with American ideals and foreign-policy objectives⁵. In that respect, drawing openly on “the highly successful summer institutes at Les Houches and

1. “Rapport administratif annuel de l’école d’été de physique théorique. Les Houches (Haute Savoie)”, 4 January 1958, CDWMP, 2015-248/1. The professors earned 80,000 francs per month in 1951, 140,000 francs in 1958.

2. Edoardo AMALDI, *20th Century Physics: Essays and Recollections. A Selection of Historical Writings*, Singapore: World Scientific Publishing Co. Pte. Ltd, 1998, pp. 443; Luisa CIFARELLI, “Lectures on pions and nucleons”, *Rivista del Nuovo Cimento*, 31, 2008, pp. 1-7.

3. See André Martin, Tran Thanh Van and Marie-France Hanseler contributions to <https://maurice-levyphysicien.fr>; Luc ALLEMAND and Vincent MONCORGE, *Les jardins de la physique*, Paris: CNRS Éditions, 2017.

4. John KRIGE, *American Hegemony...*, *op. cit.*, p. 204.

5. On the birth of the NATO Science Committee, and its support for environmental research, see Simone TURCHETTI, *Greening the Alliance: The Diplomacy of NATO’s Science and Environmental Initiatives*, Chicago: The University of Chicago Press, 2019.

Varenna”, the Science Committee dedicated significant amounts of money to help the existing schools and prompt the creation of new ones. Ramsey, speaking as science adviser of the North Atlantic Council, “considered this to be one of the most profitable ways of spending [...] money”¹. During its first year of existence, with a starting budget of \$ 150,000, this programme helped finance the Les Houches and Varenna schools – who kept their institutional independence – and created “advanced study institutes” in Naples (Italy), Kjeller (Norway) and Corfu (Greece) – all of them focusing on physics. Thus the Les Houches model was internationalized, and (re)built the foundations of a European community of physicists (Table 3). For the second year, sixteen applications were received for new summer schools, coming from disciplines such as biology, biochemistry and astronomy, though physics still prevailed. If the classification of many crucial Science Committee archives prevents historians from going further in the analysis for now, there is every reason to believe that this programme was instrumental in the diffusion of the summer school model to other disciplines².

The strongest evidence of the success of the Les Houches model may not lie so much in its replication through the NATO programme as in its reappropriation by its adversaries. Despite the strong professional and personal links uniting Cécile Morette and the Joliot-Curie couple, Morette’s school suffered collateral damage during the spirited campaign led by the French Communist Party, in 1953, against the CERN project³. The communists produced and widely disseminated an eighty-page anonymous pamphlet, *Un plan USA de mainmise sur la science* (The American Annexation of Science), accusing the United States of “using and organizing, with maximum efficiency, international science to profit American policy”⁴. Though the

1. The first quotation is from “Science Committee. Report by the working group on fellowships. Proposed advanced study institute programme”, 28 May 1958, NATO Archives Online repository (subsequently NAOR), AC/137-D/13. The whole programme is detailed in “Science Committee. Proposals made by the third NATO parliamentarians” conference”, 11 February 1958, NAOR, AC/137-D/5, and “North Atlantic council’s agreement on NATO advanced study institute programme”, 7 November 1958, NAOR, AC/137-D/29. The second quotation is from “Summary record of a meeting of the Council held at the Palais de Chaillot, Paris XVIe, on Wednesday, 30th July, 1958, at 10.15 a.m.”, 1 August 1958, NAOR, C-R(58)45.

2. “Science Committee. NATO advanced study institute programme. Note by the secretary”, 30 November 1959, NAOR, AC/137-D/52.

3. On this campaign see Armin HERMANN, Lanfranco BELLONI, John KRIGE and Dominique PESTRE, *op. cit.*, pp. 335-339.

4. *Un plan USA de mainmise sur la science*, Paris: Les Éditions de la Nouvelle critique, 1953, p. 21.

text recognized that “the quality of the [Les Houches] school is indisputable”, suspicion of scientific espionage remained strong, as the US Department of State had recently nominated a dozen scientific attachés in the American embassies in Europe¹.

The links uniting this school and the European atomic pool (CERN), the participation of the American scientific attaché [Jeffries Wyman], and other signs of this kind, reveal this institution as being integrated in an attempt to create, in parallel with the national education system [...], an education under the American influence. This is said without forgetting the possibility, induced by the American scientific attaché’s presence, to enrich the files of the Department of State concerning the state of research, and the very personalities of the researchers².

The reaction of the French communist scientists and their allies went beyond rhetoric: it took the shape of a “counterschool” project, launched in Nice by Moïse Haïssinsky in September 1953: the Centre international de chimie physique et de ses applications. This respected radiochemist, working at the Institut du radium, explained the stakes of his project in a letter to his colleague Marcel Prettre, professor at the University of Lyons:

While on vacation in Nice [...] I had the idea that it would be useful to create in Nice, during holidays, an upgrading course in physical chemistry, similar to the Ouches [sic] one for nuclear physics [sic]; that one is strongly Americanized, but the Nice one, I hope, would be very French, with the participation of physico-chemist and foreign auditors [...]. I talked about it with [Georges] Champetier and [René] Wurmser: they agreed, and agreed too that the organization of teaching should be done by “beardless” physico-chemists [...]. I think we should plan for a patronage committee, where we could put the “bearded” people – provided that their facial hair is not too long³.

The spelling error on its own is revealing: everything suggests that Haïssinsky’s knowledge of the school was in fact superficial at best. Marcel Prettre was nevertheless

1. Ronald E. DOEL and Allan A. NEEDELL, “Science, scientists, and the CIA: balancing international ideals, national needs, and professional opportunities”, in Rhodri JEFFREYS-JONES and Christopher ANDREW (eds.), *Eternal Vigilance? 50 years of the CIA*, London: Frank Cass & Co., 1977, pp. 59-81; Ronald E. DOEL, “Scientists, secrecy, and scientific intelligence: the challenges of international science in Cold War America”, in Jeroen VAN DONGEN (ed.), *Cold War Science and the Transatlantic Circulation of Knowledge*, Leiden: Brill, 2015, p. 11-35.

2. *Un plan USA de mainmise sur la science*, *op. cit.*, pp. 53-54. It must be noted that Wyman was not a physicist, but a molecular biologist.

3. Moïse Haïssinsky to Marcel Prettre, 28 September 1953, Archives du Musée Curie, Archives de l’Institut du radium, Fonds Moïse Haïssinsky (subsequently FMH), Box 15.

Table 3: Nationalities of professors and students in the first wave of NATO advanced study institutes (1959).

| Country | Les Houches | | Varenna | Naples | | Kjeller | | Corfu | |
|----------------|-------------|----------|---------|--------|----------|---------|----------|--------|----------|
| | Profs. | Students | Profs. | Profs. | Students | Profs. | Students | Profs. | Students |
| Belgium | | 2 | 1 | | | | 3 | | |
| Canada | | | | | | | | | |
| Denmark | | | 1 | | | | 1 | | |
| France | 3 | 14 | 1 | 4 | 4 | | | 1 | 4 |
| Germany | | 1 | 4 | 3 | 3 | | 4 | 2 | 3 |
| Greece | | | | | | | 1 | 1 | 18 |
| Italy | | 2 | 4 | 3 | 14 | | 4 | 1 | 1 |
| Luxembourg | | | | | | | 1 | | |
| Netherlands | 1 | | 4 | 1 | 4 | 4 | 4 | | |
| Norway | | 1 | | | | 7 | 6 | | |
| Poland | | | | | | | | | |
| Sweden | | 1 | 2 | 1 | 1 | | 2 | | |
| Switzerland | | | | 2 | 7 | | 1 | | |
| Turkey | | | | | | | 1 | | 3 |
| United Kingdom | | 4 | 2 | 2 | 1 | | 1 | 1 | 1 |
| United States | 4 | 4 | 6 | 1 | | 3 | | 2 | |
| Others | | 5 | 1 | | | | 3 | 1 | |

Source : “Science Committee. NATO advanced study institute programme. Note by the secretary”, 30 November 1959, NAOR, AC/137-D/52.
There is no record concerning the nationality of students at Varenna.

enthusiastic, and the details were established during a meeting of the Société de chimie physique, on 27 October 1953, between Haïssinsky, Prettre, Wurmser, Champetier and Bernard Pullman, with the help of a Nice resident, Marcel Devienne, a chemist strongly involved in the local section of the centre left Parti radical. During the next months, Haïssinsky managed to recruit many other colleagues of the same age group to the organization committee (e.g. Yvette Cauchois and René Audubert), and to the patronage committee some prestigious professors: Louis de Broglie, Irène Joliot-Curie, Edmond Bauer for the French, and Charles Ingold, George de Hevesy, Francesco Giordani and Karl Friedrich Bonhoeffer from the international community¹. Haïssinsky, as a former student of Marie Curie and a middle-aged man (he was born in 1898), held a social capital comparable in size with Morette’s network of allies. The major difference was that the Ukraine-born Haïssinsky’s network of relationships was, in France, pretty much limited to the scientific world. Whereas Morette had managed to find a place quickly, the various approaches attempted by Haïssinsky and Devienne to enrol the help of the Nice mayor Jean Médecin, the Principality of Monaco, or the perfumiers of Grasse, elicited many fine words and promises, but no substantial results². As a consequence, the first session, intended to focus on theoretical chemistry and chemical kinetics, planned for summer 1954, had to be cancelled – and the whole project aborted.

This failure is revealing of the power and the prestige so quickly acquired by the Les Houches school. The idea that it should be imitated was widely shared during the Cold War, even across political borders. Yet for the first international school to succeed, the role of Morette’s social dispositions and positions, and her ability to diversify her network of allies – going so far as to strike a deal with what appeared to many of her colleagues as the very Devil himself, NATO – were utterly crucial.

5 Conclusion

The impact of Cécile Morette’s transnational creation on French and European physics was tremendous. Relying on the exceptional social attributes of its founder, and on a narrative turning the internationalization of French physics into a national

1. “Centre international de chimie physique et de ses applications à Nice. Procès-verbal de la séance du comité d’organisation”, 27 October 1953, FMH, Box 15. None of these people ever went to Morette’s summer school.

2. Moïse Haïssinsky to Jean Lépine, 13 February 1954, FMH, Box 15.

imperative, this pilot institution was instrumental in the reconstruction of a European world of physics after the Second World War. It articulated local, national and global scales by intertwining resources derived from extremely heterogeneous social networks, by federating and binding together a remarkable diversity of actors, from old Girl Scout friends to state officials and NATO pundits. It managed this last without turning into a mere pawn in the Cold War. In the long run, beyond its role in the establishment of new ideas in theoretical physics, Les Houches laid the foundation for a new model for science training, based on fundamental and theoretical research, proving through example the power of teaching (and evaluating) by osmosis amongst advanced students. The creators of the *troisième cycle* in 1954, the much-awaited postgraduate level of studies, explicitly evoked the lessons learned on the Alps' slopes¹. The summer school demonstrated how pedagogical institutions could mirror and drive wider scientific change. It played a key role in the profound reconfiguration of scientific circulations, careers, institutions and practices after 1945, and in a transformation of the physicist's craft that might be characterized, in a nutshell, as the transition from the scholar's world to the researcher's world. Truly, as Blake (almost) said, "great things are done when (wo)men and mountains meet".

1. The troisième cycle is the collective name given to a wide series of postgraduate programmes, dedicated to research training, created after the seminal report of Jean COULOMB and René NAVARRE, "Rapport concernant l'organisation du 3ème cycle de l'enseignement supérieur", 10 June 1953, AN, 19800284/103.