The Big Ear of Leuk (1974–2020)

The Cultural History of a Large Technical Infrastructure

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Abstract
Switzerland's first satellite ground station was inaugurated in Spring 1974, in the alpine Canton of Valais. The antenna attached to the operations center measures approximately 30 meters in diameter and weighs, with its pedestal, 1,750 tons. Nicknamed the "Big Ear," it has generated, from its erection until today, a diverse array of representations and discourses, as evidenced by the iconographic abundance the station has aroused and by the exhibition on the site opened to the general public in 1976. In the 1960s and 1970s, as ultravisible part of the otherwise visually unsizeable network of satellite communications, the ground stations' parabolic antennas have come to shape a transnational imaginary that celebrates the modernity of space activities. This article proposes to explore the cultural history of the Swiss ground station through an analysis of its prevailing representations. This overview reveals the multiplicity of historically and geographically situated meanings attached to the infrastructure and evaluates their ideological implications in a *longue durée* perspective.

"[A]n infrastructure is difficult to visualize in its entirety within a single frame."[1] Media scholar Lisa Parks' observation holds particularly true for the global satellite communications system, a network comprising satellites in orbit and audiovisual signals, as well technical and juridical standards, state-owned and private industrial consumers, and regulatory institutions around the world. Nevertheless, parts of this vast infrastructure are visible, even hypervisible, such as the ground stations' parabolic antennas. They have therefore become a privileged site for discourses on, and representations of, the system as a whole. In the 1960s and 1970s, the materiality, monumental size, and lunar aesthetic of satellite dishes made them one of the principal symbols for the expanding field of space communications. Having been readily employed as an emblem for the conquest of space,

1 Parks 2015, p. 356; see also Parks/Starosielski 2015.

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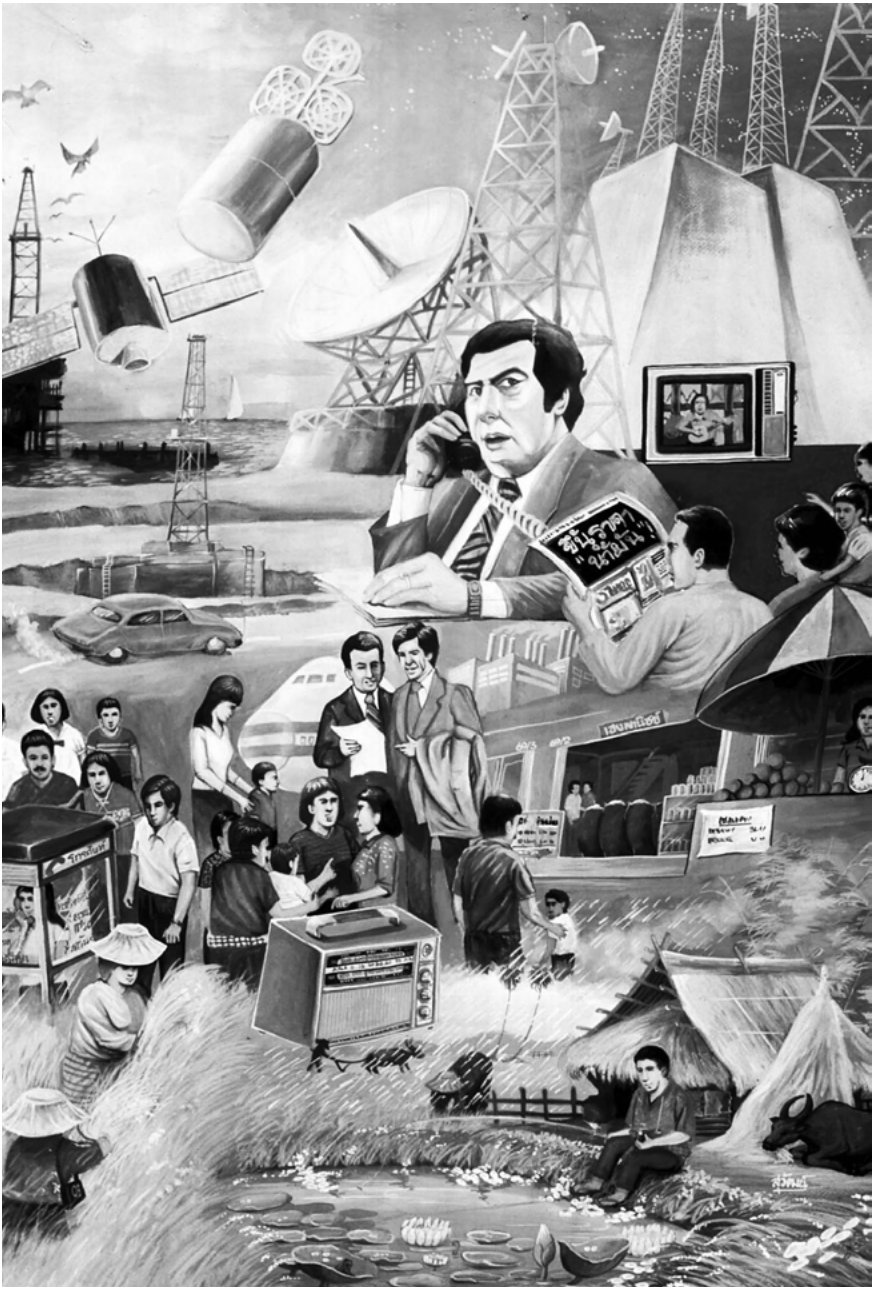

Fig. 1: Drawing produced as part of a children drawing competition organised during ITU's Telecom 83 conferences and public exhibition, 1983. Reproduced with the kind permission of the ITU.

parabolic antennas have come to shape a transnational imaginary that celebrates the modernity of extra-atmospheric activities (Fig. 1).[2]

Switzerland's first ground station was inaugurated in Spring 1974, in the municipality of Leuk, in the canton of Valais. The antenna attached to the operations center measures approximately 30 meters in diameter and weighs, with its pedestal, 1,750 tons.[3] Quickly nicknamed the "Big Ear",[4] it has generated, from its erection until today, a diverse array of representations and discourses produced by various actors, as evidenced by the iconographic abundance the station has aroused and by the exhibition on the site opened to the general public in 1976. The station has thus been "framed"[5] – to use the notion proposed by this issue's introduction – in different manners depending on the objectives pursued, as well as the scale and period considered, with its dominant image evolving over time.

Since the 1980s, and the seminal work of Thomas P. Hughes,[6] the history of infrastructures has accounted for their sociotechnical dimension by regarding them as a combination of material, social, political, and institutional elements.[7] Historical studies have, however, given less attention to the cultural side of infrastructures, even though it is fundamental.[8] This article proposes to explore the cultural history of the first Swiss ground station through an analysis of its prevailing representations as we were able to reconstruct them from public and private archives.[9] This overview reveals the multiplicity of historically and geographically situated meanings attached to the infrastructure and evaluates their ideological implications.

2 For a cultural history of space activities, see Geppert 2012; Kilgore 2003.
3 La station terrienne suisse pour satellites de Loèche VS, PTT 617.01 fr / 74, ASSR, B 001.213.03.9.
4 See for instance: L'Oreille géante de la Suisse inaugurée à Brentjong, *Le Nouvelliste,* 3. 5. 1974; La Journée des PTT au Comptoir de Martigny: 20 millions pour la «grande oreille», *L'Express*, 5. 10. 1978; Une deuxième «oreille» à Loèche, *L'Express*, 5. 10. 1979.
5 See introduction.
6 Hughes 1983; Mayntz/Hughes 1988.
7 Van der Vleuten 2004.
8 For a cultural perspective on large technical systems, see for instance Badenoch/Fickers 2010; Schueler 2006.
9 For this paper, we have consulted archival material from the Museum für Kommunikation (MFK), the Swiss Federal Archives (SFA), the Swiss PTT Archives, the International Telecommunication Union (ITU) Archives, the Radio Télévision Suisse (RTS) Archives and the Médiathèque of Sion as well as the regional and national press.

Switzerland Officially Enters "the Era of International Communications"

In 1964, the Swiss Confederation joined the first intergovernmental organization for satellite communications, Intelsat. Founded on the initiative of the United States, the consortium aimed to establish a worldwide commercial space communications system. As a founding member, Switzerland had recourse to satellite links for its intercontinental telephonic, data, and telex exchanges from the moment the network launched its first satellites into orbit. Nevertheless, Switzerland remained cautious. In order to benefit from the Intelsat services, the Federal Council allocated funds to co-finance French and German ground stations, amounting to 5% of the capital invested in each of them, for a total of 5.8 million francs.[10] This modest sum reflected the government's reservations about satellite communications, which were regarded as "still too recent."[11] Co-ownership allowed the risk to be spread without "jeopardizing the possible future construction of a ground station in Switzerland."[12]

The possibility of a Swiss ground station was nevertheless raised as early as 1964,[13] and a working group was created to study the question.[14] The experts were unanimous: the construction of a ground station should start "immediately."[15] The main argument in favor of the project was addressing the increase in overseas telephone traffic, in particular with the United States. Before the 1970s, it had been advantageous to rely on neighbouring countries' facilities to carry the modest intercontinental traffic. It was, however, soon to increase rapidly. In 1972, the Swiss Postal Telegraph and Telephone agency (PTT) operated 70 circuits via satellite, 49 of which were exclusively for the United States, and it was expected that intercontinental traffic would double over the next four years.[16] It was now appealing for Switzerland to possess its own station. In 1969, the Federal Council granted the funds.[17] This decision corresponded with a period of growth for the Intelsat network: in 1965, there were three ground stations in the world; in 1970, there were 45; and in 1975, 113.[18] As of 1974,

10 Arrêté fédéral du 16 décembre 1965. *Feuille fédérale* (FF), vol. III, nº 52, 31. 12. 1965, p. 745; Message du Conseil fédéral du 3 septembre 1965, FF, vol. II, nº 37, 16. 9. 1965, pp. 1077–1080.
11 Ibid., p. 1078.
12 Ibid.
13 Protokoll über die 1. Sitzung der Arbeitsgruppe vom 2. 5. 1967 in Bern, 3. 7. 1967, SFA E8210A#1992/30#162*.
14 «Schlussbericht und Antrag», 30. 4. 1968, SFA E8210A#1992/30#162*.
15 Protokoll über die 2. Sitzung der Arbeitsgruppe vom 7. 12. 1967 in Bern, 22. 2. 1968, SFA E8210A#1992/30#162*.
16 Die schweizerische Satelliten-Bodenstation wird gebaut, *Revue des PTT*, nº 5, 1972, p. 2.
17 Décret du Conseil fédéral, 12. 2. 1969, SFA E2003A#1984/84#1129*.
18 Huurdeman 2003, p. 418.

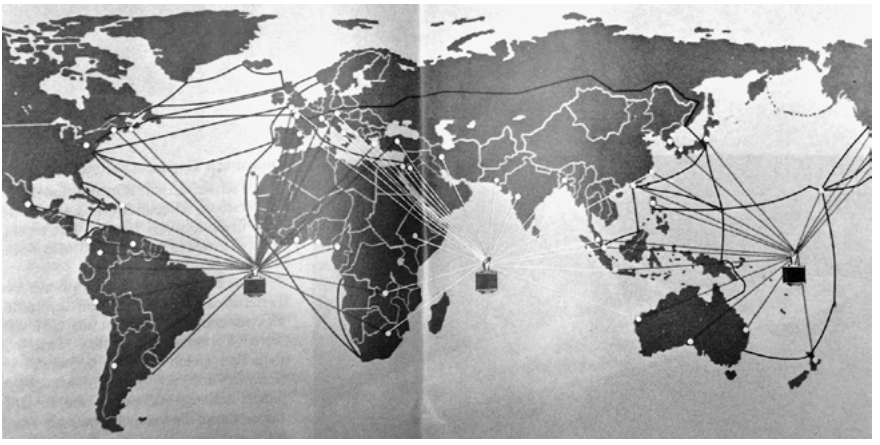

Fig. 2: Map of connections that will soon be possible thanks to the Leuk ground station, 1972. *Revue des PTT*, nº 5, 1972, p. 3.

the Valais station thus allowed for a steady flow of traffic with the United States, Canada, Brazil, and Israel.[19] With the unveiling of the second antenna in 1980 and then a third in 1984, it became possible to link to Asia, Africa, and Australia (Fig. 2). As for the fourth antenna, which entered into operation in 1986, this one connected Switzerland to the new European space telecommunications system, Eutelsat.[20]

The Big Ear of Leuk, thanks to its materiality, its visibility, and the imaginary associated with this type of infrastructure, was immediately seen as a proof of Switzerland's participation in a technological modernity that remained the prerogative of world economic powers. "This inauguration officially brings our country into the era of international satellite communications",[21] declared *Le Nouvelliste* in May 1974. The PTT also used the station to assert an active role in the development of the latest communication techniques and to remind everyone of their early participation in the Intelsat system, as evidenced by this passage from the March 1971 issue of *La Revue des PTT*: "As a founding member of the International Telecommunications Satellite Organization (INTELSAT), Switzerland participated as early as 1964 in the new, promising possibilities of a global

19 Pius Breu, Kurt Scherrer, La future station suisse pour satellites, *Bulletin technique des PTT*, nº 7, 1973, p. 292.

20 Inauguration de la deuxième antenne de Brentjong, *Le Nouvelliste*, 20. 5. 1980; Nouvelle Oreille à l'écoute du monde, *Le Nouvelliste,* 16. 5. 1984; Loèche à l'écoute du ciel, *L'Express*, 5. 6. 1986.

21 L'Oreille géante de la Suisse inaugurée à Brentjong (see note 4).

telecommunications satellite system and has since then played an active role in its further development."[22]

The triumphant tone of the PTT was, however, out of step with the reality of the often-bitter multilateral debates that characterize the history of Intelsat. Since its creation, Intelsat's mode of organization was criticized by Swiss authorities who denounced, like the majority of European countries, the consortium's domination by the United States and its industries.[23] Yet the PTT was increasingly dependent on satellite for their intercontinental communications; Switzerland had no choice but to participate in the system. Examined critically, the Leuk station could be understood as a manifestation of the Swiss PTT's dependence on a system dominated by the United States and denounced as such. Obviously, this admission of weakness would have been a bad strategy for the PTT, which sought to promote itself to the public by capitalizing on the symbolic power of the infrastructure. This strategy was evident when the PTT was the guest of honour in 1988 at the Comptoir Suisse, a national trade fair. The PTT "c[a]me out in full force"[24] with the decision to hold a press conference not in Lausanne, where the fair was taking place, but at the Leuk station. It was an occasion to extol the technical prowess of their infrastructure, as *L'Express* echoed in its praise for "the height of precision that has been continuously achieved [...] at the station," where "downtime has never exceeded two tenths of a second!"[25]

International Symbol, National Pride, and Local Anchorage

Commercial fairs played an important role in the formalization and diffusion of representations of the Swiss ground station. Besides the 1988 Comptoir Suisse, another Comptoir, in Martigny, Valais, became a regular promoting platform for the station. Already in 1972, the infrastructure then under construction was the "star"[26] of the event, while the initiation of its operations and the installation of successive antennas took pride of place in subsequent editions.[27] This recurrence highlights the regional significance of the station. The Martigny Comptoir constituted an opportunity for the Swiss PTT to advertise a prestigious part of their activities. However, at

22 Eine eigene Satelliten-Bodenstation im Wallis, *Revue des PTT*, nº 3, 1971, p. 67.
23 On Switzerland and Intelsat negotiations, see Zellmeyer 2008.
24 Le lion PTT, *L'Express*, 1. 9. 1988.
25 Ibid.
26 Le Comptoir de Martigny sous le signe des fleurs mais on pensera aussi au 3e âge, *L'Express*, 13. 9. 1972.
27 Fêtez avec nous le 15e Comptoir, *La Gazette,* 4. 4. 1974; La Journée des PTT au Comptoir de Martigny, art. cit.; Importants projets des PTT en Valais, *L'Express*, 8. 10. 1982.

the same time, the event assigned the Big Ear a local identity. Its promotion in Martigny was accompanied by discourses that indicated such an anchorage. For example, in 1987, the district directorate for telecommunications [Direction d'arrondissement des télécommunications, DAT] in Sion portrayed the infrastructure as a hotspot for international exchange and, in so doing, embedded it in the regional transit history: "If the Great St. Bernard Pass and the Simplon Tunnel [opened in 1906] made Valais a place of international road and rail transit, the plateau of Brentjong above Leuk has made the Rhône Valley a nerve centre for intercontinental telecommunications, allowing Switzerland to listen to space."[28]

The station's local assignation was also carried out by inscribing it within the canton's Catholic tradition: the station was blessed by Monsignor Adam, Bishop of the Sion Diocese, upon its inauguration, while the 1976 exhibition pavilion and the inauguration of the third parabolic antenna in 1984 received the blessing of Abbot Salzmann.[29]

Thus, different scales interact in the meanings attached to the Swiss station. This articulation played out in an interesting way when the station was made to serve the objectives of an international organization, the International Telecommunication Union (ITU). In 1975, the Geneva-based institution organized a press conference for its upcoming exhibition, Telecom 75.[30] The day-long event was held "in the exceptional surroundings of the Swiss station"[31] and included about a hundred participants from 14 countries.[32] It was an occasion to celebrate the benefits of the multilateral cooperation that the ITU aimed to embody. But the event also benefited local and federal authorities, for whom it provided a platform for addressing the international press. Lunch was punctuated by speeches from Valais State Councillor Antoine Zufferey, a representative from the cantonal Tourism Office, and a representative from the Valais agricultural bureau, an "eloquent advocate for [the region's] wines."[33] This visit by the ITU, like that of its Administrative Council in 1976[34] and that of the winner of the drawing competition organized as part of the 1983 Telecom exhibition,[35] made the Swiss station the object of various discourses that were more complementary than contradictory. The infrastructure was simultaneously

28 En ligne avec..., *Le Nouvelliste,* 29. 9. 1987.
29 L'Oreille géante de la Suisse inaugurée à Brentjong (see note 4); Inauguration d'un pavillon d'exposition à la station terrienne de Brentjong, *Le Nouvelliste*, 7. 5. 1976; Nouvelle Oreille à l'écoute du monde (see note 20).
30 Weber et al. 2020.
31 TELECOM 75, *Journal des télécommunications*, vol. 43, nº 2, 1976, p. 80–81.
32 En Valais pour une journée d'information sur Telecom 75, *Le personnel des PTT*, Winterthour, 29. 5. 1975.
33 Ibid.
34 L'UIT reçue à Sierre, *Le Confédéré*, 25. 6. 1976.
35 TELECOM 87, *Journal des télécommunications*, vol. 54, nº 5, 1987, p. 306.

a manifestation of the global system of satellite communications of which the ITU claimed to be a principal builder, a testament of Swiss participation in this system, and the pride of a region by offering it national and international visibility.

This unanimity may appear surprising for the early 1970s. Indeed, this period constituted a turning point in environmental awareness in Switzerland as evidenced, for instance, by the creation of the Federal Office for the Environment in 1971 and the mobilization of the antinuclear movement.[36] In Valais, the subject was taken up in particular by the writers Maurice Zermatten and Maurice Chappaz, who spoke out against the consequences of mass tourism and the commodification of the Alps.[37] The plateau of Brentjong, above Leuk, was chosen for the ground station following a study that considered climactic and geological conditions, the unobstructed access to satellites over the Atlantic and Indian Oceans, and the price of the land.[38] The Federal Commission and the Valais League for the Protection of Nature were then involved in the implementation process,[39] proof that environmental issues had to be taken into account henceforth in infrastructure projects. The lack of archival material prevents us from determining whether conflicts arose during these discussions. However, a review of the regional press allows us to state that the construction did not arouse public controversy. On the contrary, the press was positive, even enthusiastic, like the Catholic and conservative *Nouvelliste*, which affirmed that "[i]t is clear that all of Valais can only be happy at this achievement, which will raise the profile of our canton, and which will certainly have a favourable impact on our economy."[40] Similar comments were made by the socialist newspaper *Le Peuple Valaisan*, which judged that such a project was "in the interest of the canton's national and international reputation."[41]

A Technological Miracle in the Swiss Alps

While environmental contestation is absent from the dominant representations of the Big Ear, the landscape itself occupies a fundamental place. The plethora of photos, drawings, and films depicting the Valais facilities generally show them against the backdrop of the surrounding mountains.

36 Walter 1990, p. 243–263.
37 Bourgeois 2019; Rosselet 1916.
38 Eine eigene Satelliten-Bodenstation im Wallis (see note 22), p. 67; Breu/Scherrer (voir note 19), p. 287–288.
39 Station terrienne de Loèche, *Le Peuple Valaisan*, 9. 4. 1971.
40 La station terrienne pour satellites à Loèche: début des travaux sous peu, *Le Nouvelliste*, 26. 5. 1972.
41 La station terrienne suisse en Valais?, *Le Peuple Valaisan*, 27. 3. 1970.

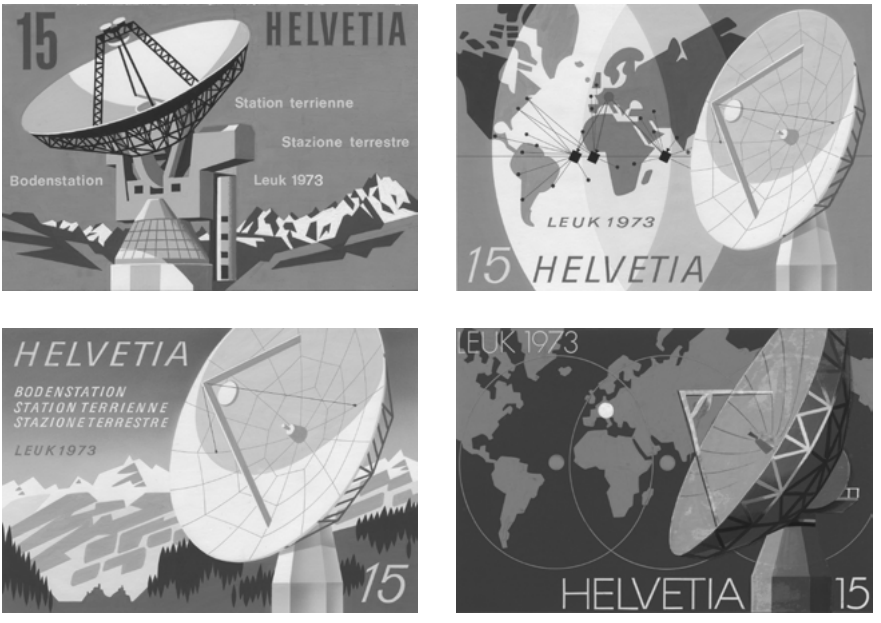

Fig. 3: Drafts of stamps for the Swiss PTT, 1973. MFK. Phil 04945; Phil 04947; Phil 04947 (Weitere Medien); Phil 04948 (Weitere Medien).

The notion of "technological sublime" developed by David E. Nye is particularly useful for approaching these images.[42] He defines the sublime as "an essentially religious feeling, aroused by the confrontation with impressive objects"[43] that produces admiration "often tinged with an element of terror."[44] These objects can be natural, like Niagara Falls, or they can be human constructions, like railroads or skyscrapers. The notion of the sublime dates back to antiquity. But, according to Nye, the nineteenth century, characterized by a popular fascination with the technologies of industrial society, gave birth to the technological sublime.

Many representations of the Leuk station combine the natural sublime embodied by the Alps with the technological sublime of the parabolic antenna. In the Swiss national imaginary, the Alps constitute a powerful and lasting symbol of national identity.[45] The Swiss PTT exploited this combination to make their infrastructure a marker of national technological power. In this regard, a series of preliminary drafts of stamps from 1973

42 Nye 1994.
43 Ibid., p. xiii.
44 Ibid., p. xvi.
45 Walter 1991; Zimmer 1998.

Fig. 4: Screenshot from the PTT-Produced film *Die Satelliten-Bodenstation Leuk*, 1994. MFK. FLM 0774.05.

prove interesting.[46] Each of the designers proposed at least two stamps, sometimes highlighting the international connectivity offered by the infrastructure, sometimes its alpine character by placing the satellite dish against a backdrop of stylized mountains (Fig. 3). In all cases, the antenna is the star of the drawings, confirming its capacity to evoke a complex global infrastructure comprised of both tangible and intangible elements. Moreover, by drawing attention to the station's international character and/or its national identity, this series contains the two fundamental elements of the PTT discourse on its infrastructure.

A documentary produced by the PTT in 1974 on the construction of the station constitutes another example of the alliance between industrial technology and traditional elements as an organizing principle in the station's representations.[47] Throughout the film, the construction site, populated by engineers and bulldozers, is mirrored by images of the mowing of fields by hand, a beekeeper, and peaceful cows, interspersed with wide shots of the mountains and the Rhône Valley. The setting gives the impression of the surge of progress in the region, as if nothing had happened since "more than two centuries ago, [when] a winegrower built his house [there]." These words open the documentary, whereas it ends on an image that would soon become iconic: the Big Ear "reaching out toward space," surrounded by peaks. Twenty years later, another PTT film offered a particularly kitschy version of this iconic image (Fig. 4).

While Swiss PTT productions were based to a certain degree on nationalism, this element may be absent when the images of the station are generated in other contexts. In this regard, the work of the architects Heidi and Peter Wenger, who designed the station's operations centre and exhibition pavilion, opens up a new perspective on the Leuk station. Although functional imperatives determined the centre's design, the architects approached the project according to their own conceptual and

46 MFK, Phil 04945 to Phil 04948.

47 Jacques Thévoz, *La grande oreille, station terrienne suisse de télécommunication par satellite*, Entreprise des PTT suisses, 1974.

Fig. 5: The station photographed by Peter Wenger, 1976. © Stiftung Heidi und Peter Wenger.

aesthetic logics. Known for their interest in natural structures, the Wengers created experimental works that fit strict geometrical parameters.[48] The operations centre is a low, tetrahedral structure. The PTT had asked the architects that it be "in harmony with the landscape" and that it provide a "complement to the aesthetics of the antenna."[49] As for the exhibition pavilion, it is a white geodesic dome (Fig. 5)[50] that draws on the futuristic architecture of the pavilion designed by Richard B. Fuller for the United States at the 1967 World's Fair in Montreal.[51]

The architects mobilized both the technological sublime and the natural sublime, as Peter Wenger's photographs illustrate (Fig. 5). But in this case, the mountains and the antenna showcased the architects' professional achievements, for which national identity was not an issue. Furthermore,

48 Frey 2006; Brühlmann 2010.
49 La station terrienne suisse pour transmissions par satellites, *Revue des PTT*, nº 9, 1974, p. 8.
50 Schweizerische Satellitenbodenstation, Leuk VS: Architekten: Heidi und Peter Wenger, *Das Werk. Architektur und Kunst*, vol. 62, nº 9, 1975, p. 806–809; Geodätische Kuppel als Ausstellungsraum, Leuk VS: Architekten Heidi und Peter Wenger, *Das Werk: Architektur und Kunst*, vol. 63, nº 11, 1976, p. 758–759.
51 These modernist domes have enjoyed worldwide popularity and posterity. Díaz 2011.

Fuller's geodesic domes were the result of the architect's reflections on equitable resource management and the principle of holistic architecture, notions taken up by the Wengers. Paying attention to their approach thus reveals dynamics in innovation generally neglected by historiography and highlights alternative voices in the "framing" of large infrastructures. The promotional film on the website of the company currently owning the facility provides a final, more recent example of the usage of the ground station's emblematic image.[52] Here, the technological and the natural sublimes serve the business objectives of a multinational corporation.

Although at the service of differentiated aims, these representations all benefit from, and convey, an ideological vision of progress, innovation, and modernity embodied by space technology, which we find, in another form, in an educational exhibition for the general public that was inaugurated in 1976.

Infrastructural Tourism and Pedagogy Tainted by Ideology

The fascination with the Big Ear also became manifest in the public's desire to see the impressive infrastructure for themselves and to feel the emotions that its tangible proximity elicits. As Nye shows, the technological sublime attracts crowds (Fig. 6). In an article entitled "Infrastructural Tourism," the anthropologist Shannon Mattern highlights the contributions of a "direct corporeal experience" to understanding large infrastructures.[53] By the end of its first year of existence, the Swiss station had received 1,900 visitors, while in 1986 it celebrated the 1,000th group, for a total of 350,000 people.[54] From 1976, the public was welcomed in a "small futurist village"[55] built to cope with the craze. The Wengers' dome officially established the ground station as a space of knowledge production not only on the station's own functioning but also on the global space telecommunications system. The pavilion presented models of satellites, of launchers, and of the station and explanatory diagrams showing the Intelsat network and the path of telephone signals over the Atlantic, as well as educational panels on several aspects of satellite telecommunications, all in a futuristic architectural

52 Signalhorn – The Sky Is Not The Limit, *Signalhorn*, 2014, www.signalhorn.com/about-us.html.
53 Mattern 2013.
54 Inauguration d'un pavillon d'exposition à la station terrienne de Brentjong (see note 29); Station satellite de Loèche: Millième groupe et 350 000 visiteurs en dix ans, *Le Nouvelliste*, 13. 10. 1986.
55 Deuxième parabole pour l'antenne de la station-satellite de Loèche, *Gazette de Lausanne*, 22. 5. 1980.

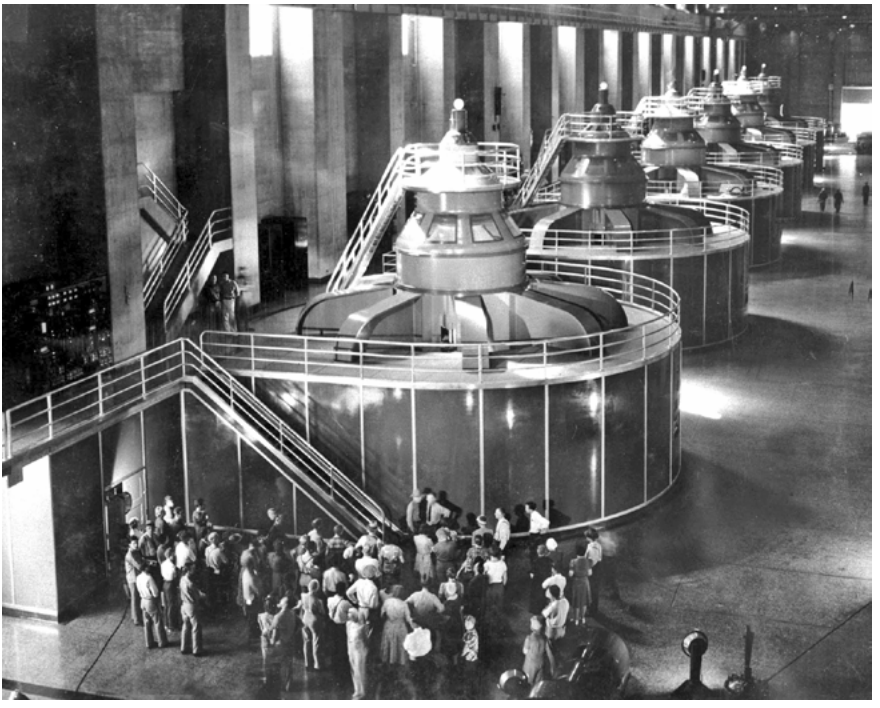

Fig. 6: Tourists visiting the Hoover Dam power plant in Colorado, 1940. Bureau of Reclamation, Wikimedia Commons.

atmosphere (Fig. 7).[56] But the station also played an educational role regarding space activities through other channels than its dome, such as in a PTT documentary from 1994,[57] in Swiss public television reports,[58] and in press articles on the station.

However, while the technical aspects of space communications were explained, their geopolitical dimensions were not addressed. A paradigmatic example was the presentation of the geostationary orbit. An invariant of space pedagogy, this orbit is also a site of high international tensions.[59] It was thus readily explained that a satellite placed in orbit 36,000 kilometres above the equator floats continuously above the same point on Earth. At this height, it moves at the same speed as the Earth, allowing three linked

56 MFK, Satelliten-Bodenstation Leuk, Info-Pavillon, FFF 11136 à FFF 11173; Télévision éducative. Telactualité: l'espace au quotidien, TSR, 24. 2. 1986.
57 *Die Satelliten-Bodenstation Leuk*, Generaldirektion PTT, AudioVision, 1994.
58 In February 1986, the ground station and space activities in general were the subject of a pedagogical programme on the French speaking Swiss public television. Télévision éducative. Telactualité: l'espace au quotidien, TSR, 24. 2. 1986.
59 Collis 2012; Courteix 1985.

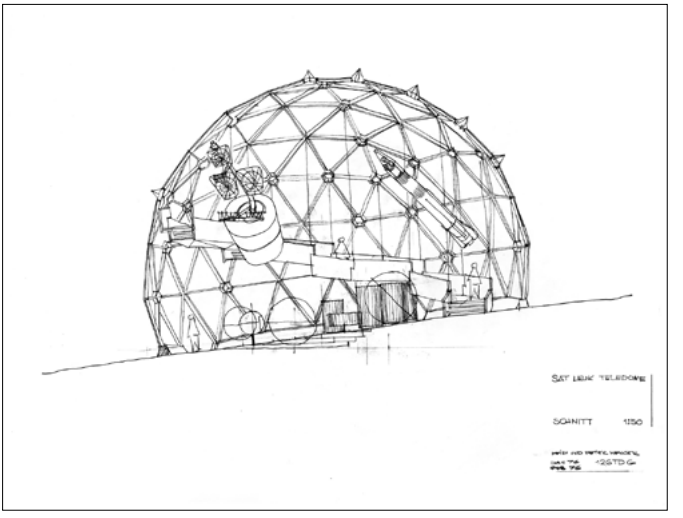

Fig. 7: Plan for the Exhibition Pavilion, 1976. © Stiftung Heidi und Peter Wenger.

satellites to offer complete and permanent coverage of the planet. On the other hand, it was not explained that this orbit is a finite resource and that its use was governed, until the end of the 1970s, by the principle of first come, first served, which encouraged its monopolization by the major industrial powers. The "geostationary gold"[60] was at the heart of heated debates in the United Nations, standing in the context of the growing protest movement of the countries of the Global South organized within the Non-Aligned Movement.[61]

The occultation of the contested nature of infrastructures is ideological. In obscuring the geopolitics of the exploitation of the outer space resources, the Leuk exhibition, as well as the official speeches, iconographic projects, and film productions on the station, fuelled a vision of space communications that fit within the utopian idea of a world made peaceful through communication technologies.[62] These discourses on the global satellite system perpetuated a perception of large technical networks that, since the Enlightenment, has credited them with the power to connect peoples across borders and be seeds of peace and prosperity.[63] This discursive arsenal is, for example, fundamental for the *free flow of information* doc-

60 Warf 2007, p. 388.
61 Nordenstreng/Schiller 1979; Nordenstreng 2012.
62 Mattelart 2008.
63 Högselius et al. 2016.

trine, the cornerstone of the United States' communication policy during the Cold War.[64]

The pavilion did offer educational tools on the Swiss ground station. But this knowledge was ideologically and historically situated. It must therefore be read in light of the power dynamics that the exhibition tended to make invisible. In "Infrastructural Tourism," Mattern examines ways of experiencing infrastructures from a citizen perspective and through the production of an alternative pedagogy.[65] The Valais dome does not fall into this category. More generally, the dominant image of the Swiss Big Ears was positive until the late 1990s. It conveyed, through a variety of forms, a historical belief in technology and progress without addressing the geopolitics of satellite communications. By contrast, the passage into the 21st century heralded the Swiss station's entry into a contested period of its history.

Epilogue: the 2000s or the End of Utopia

In 1998, the Swiss telecommunications sector was liberalized.[66] The PTT was dissolved and Swisscom, a public limited company, was created. Restructuration was undertaken. In 2000, Swisscom decided to abandon the space sector and sell the Leuk facilities.[67] They were no longer profitable: international traffic now mainly passed through submarine cables and optical fibres.[68] Furthermore, once a symbol of modernity, its equipment had become obsolete and the necessary investments too high. In January 2001, the station was sold to Verestar, a subsidiary of a major US broadcasting service provider.

The passage of the Valais infrastructures into hands that were not only private but also foreign provoked protest. At the local level, there were concerns regarding the 30 jobs at stake and losses to the regional economy. The State Council of Valais strongly condemned the sale,[69] and a journalist at the regional television channel asked the Swisscom spokesman incisive questions about the jobs at risk, just a few of some 3000 jobs that the company intended to eliminate.[70] The social question, hitherto absent from representations of the satellite centre, arose within the context of the liberalization of the public sector. In the process, the human work necessary

64 Nordenstreng 2011.
65 Mattern 2013.
66 Ischer 2007.
67 Station satellite de Loèche, *Canal 9*, 31. 3. 2000.
68 Warf 2006.
69 Swisscom: le CE condamne, *Le Confédéré*, 31. 3. 2000.
70 Station satellite de Loèche (see note 67).

for the functioning of the infrastructure was made visible, an aspect rarely thematized in representations of technological innovation.[71]

At the governmental level, questions regarding the new owner, whose activities would take place near the heart of the Swiss intelligence system, began to arise. In 1997, the Federal Council decided to develop the Onyx satellite communications interception programme, which entered into experimental service in 2000,[72] with some of the programme's antennas built on the Leuk site. In the wake of Swisscom's announcement, concerns related to the secrecy and independence necessary for the intelligence activities mounted. In September 2000, the federal delegation responsible for overseeing Onyx expressed "its extreme concern."[73] Fears were also fuelled by the nature of Verestar's business. National Councillor Bernhard Hess (Swiss Democrats/Bern) filed an interpellation on this subject in November 2000. He was concerned about the collaboration between Verestar and the US Navy and questioned potential links between the operator and the US National Security Agency (NSA).[74] The Federal Council admitted that a subsidiary of Verestar counted the US Navy, the Defense Information Systems Agency, and the Space and Naval Warfare Systems Center among its clients, but it assured that the strict division of the Leuk land between the areas dedicated to Onyx and Verestar's infrastructure would protect the country's interests.[75]

The case did not end there. Between 2000 and 2002, reports from the French, Belgian, and European parliaments indicated that the Onyx system would become part of the ECHELON multinational intelligence network, while in 2003, the press reported that the Ears, now "warlike,"[76] would be used by the United States in the context of the conflict in Iraq. These rumours provoked reactions in the parliamentarian ranks.[77] The Federal Council replied that the European reports were based on the distorted words of a journalist.[78] An investigation by a federal delegation led to the same conclusion.[79] End of story? No. But a ten-year lull.

71 On this subject, see for instance Casilli 2019.
72 Système d'interception des communications par satellites du Département fédéral de la défense, de la protection de la population et des sports (projet «Onyx»). Rapport de la Délégation des commissions de gestion des Chambres fédérales du 10 novembre 2003, p. 1378.
73 Ibid., p. 1412.
74 Interpellation Hess Bernhard, 00.3629, 28. 11. 2000.
75 Avis du Conseil fédéral du 9. 3. 2001 sur Interpellation Hess Bernhard, 00.3629, 28. 11. 2000.
76 Oreilles guerrières, *Le Nouvelliste*, 4. 4. 2003.
77 Interpellation Raggenbass Hansueli, 01.3601, 5. 10. 2001; Postulat Baumann J. Alexander, 01.3189, 23. 3. 2001; Question ordinaire Baumann J. Alexander, 03.1046, 8. 5. 2003.
78 Réponse du Conseil fédéral du 20. 8. 2003 à Question ordinaire Baumann J. Alexander, 03.1046.
79 Système d'interception (see note 72), p. 1414–1415.

Fig. 8: The Leuk parabolic antennas in 2007. Rama, Wikimedia Commons, Cc-by-sa-2.0-fr.

In 2013, controversy over the links between the Swiss Big Ears and the NSA resurfaced in the wake of Edward Snowden's revelations, which exposed how US espionage passes through private companies. At issue: the facility's current owner, Signalhorn,[80] a company which has provided military solutions to several governments. In addition, while the Federal Department of Defence, Civil Protection and Sport (DDPS) maintains antennas at the site, it also rents services from Signalhorn. The media discussed the revelations,[81] while National Councillor Balthasar Glättli (Green Party/Zurich) bombarded the Federal Council with questions and demanded more transparency on the Confederation's intelligence activities.[82]

The 2000s thus saw the emergence of new representations of the Leuk station linked to the privatization of the facilities and their new military use. Once the pride of the national PTT, the Leuk station is now owned by

80 Signalhorn is a subsidiary of the Luxembourg based company SES Global, which absorbed Verestar in 2004. «Les antennes de Loèche (VS) pourraient être utilisées par l'espionnage américain», *Forum,* RTS, 17. 6. 2013; «La NSA espionne-t-elle le monde depuis le Valais?», *RTS Info*, 19. 11. 2019.

81 «Les grandes oreilles de Loèche sont-elles au service des USA?», *Tribune de Genève*, 30. 10. 2013; «Die grossen Ohren von Leuk und die US-Geheimdienste», *Swissinfo.ch*, 8. 11. 2013.

82 Question Glättli Balthasar, 13.5389, 18. 9. 2013; Question Glättli Balthasar, 13.5390, 18. 9. 2013; Question Glättli Balthasar, 13.5391, 18. 9. 2013; Interpellation Glättli Balthasar, 13.3942, 27. 9. 2013; Motion Glättli Balthasar, 13.3943, 27. 9. 2013.

a private foreign company. The link with national identity has been severed. Moreover, whereas the station formerly provided civilian services, the launch of the Onyx project and the successive buyouts by firms working with foreign secret services changed everything. Henceforth, the civil and the military, the public and the private would exist side by side in Leuk, a combination that creates confusion. In this regard, the investigative journalist Duncan Campbell said, "The Leuk station is unique in my experience in working as a civilian station while also supporting government intelligence gathering directly inside."[83] These words are taken from a recent web documentary that decrypts five key moments from the history of espionage in Switzerland. As of August 2020, the episode on "the sulphurous history of Leuk"[84] has been viewed more than 23,560 times.[85]

Today, the dominant image of the Valais antennas is tainted by suspicion. They are part of an opaque international geopolitics over which citizens have no control. In the context of the establishment of an unprecedented surveillance system by the United States following the 9/11 attacks, the ground station is perceived as one link in a network distinguished by its democratic deficit. The Leuk infrastructure has thus become a medium for criticizing the lack of transparency in national and international intelligence activities. The technological sublime is now more than ever "tinged with an element of terror."[86]

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83 La Suisse sous couverture – Les grandes oreilles de la Confédération (2/5), *RTS documentaires*, 19. 11. 2020, 4 min 27 sec.
84 Ibid., 7 min 1 sec.
85 Combined viewings on the documentary web page and on YouTube.
86 Nye 1994, p. xvi.

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