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RESEARCH ARTICLE

## Communicating science, mediating presence: reflections on the present, past and future of conferencing

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### Abstract

The move online of almost all meetings in 2020 in the wake of the COVID-19 pandemic threw into sharp relief the taken-for-granted centrality of conferences within scientific culture. While its impact on science has yet to be fully grasped, for the authors of this special issue, this situation held heuristic power for understanding the meanings and functions, now and historically, of international scientific conferencing. Ongoing discussions in the academic world about the pros and cons of virtual meetings bring out the central place of presence in these events and its mediation across space and time by modern infrastructures and technologies. From their rise in the mid-nineteenth century to the experiences of the present day, as well as in imagined futures, international conferences have been about communication. Following James Carey, they can be considered both as places for sharing knowledge and as rituals aimed at fostering and performing communities.

Is real-life conferencing becoming a relic of past times? The move online of almost all scientific meetings in the spring of 2020 in the wake of the COVID-19 pandemic threw into sharp relief the often taken-for-granted centrality of conferences within scientific (and other) cultures, and perhaps also their dispensability. Virtual meetings do have many advantages. In the form of the ‘virtual conference call’ they have the potential to speed up the communication of results. In addition, as Karen Daniels, a physicist at North Carolina State University in Raleigh, claimed in March 2020,

If anything, the talk quality was easier to see ... Nobody’s head was blocking your way ... There’s a lot of reasons that we should have virtual meetings ... Meeting spaces that are inaccessible to some disabled scientists, health considerations, a lack of access to childcare and travel restrictions can all end up alienating potential attendees from physical conferences.<sup>1</sup>

The journal *Nature* has been a sharp observer of, and commentator on, these developments. In April 2020 it surveyed attendees of the first virtual American Physical Society meeting, and revealed that 82 per cent of 455 respondents would be willing to

<sup>1</sup> Guliana Viglione, ‘A year without conferences? How the coronavirus pandemic could change research’, *Nature* (March 2020) 579, p. 327.

attend an online conference in the future.<sup>2</sup> Attendance at that meeting increased by 300 per cent compared with previous in-person meetings, and the number of countries represented increased to seventy-nine from twenty-eight the previous year. It was considered a success.<sup>3</sup> A year later, the journal carried out a similar poll, finding that 74 per cent of respondents believed, despite growing Zoom fatigue, that meetings should continue to be virtual, at least in part.<sup>4</sup> *Nature* employees themselves adopted the position that ‘the move to virtual [should be] the default for scientific interactions’, advocating the widespread adoption of the ‘ABCD framework (All continents, Balanced gender, low Carbon transport, Diverse backgrounds).’<sup>5</sup>

The flurry of questions about the future of conferencing in a world where planes were suddenly grounded and people were locked in their homes merged with concerns about the environmental impact of science. An editorial of *Nature Review Physics* that appeared just before the West went into lockdown argued for ‘Rethinking conferences’: ‘How can physics reap the benefits of conferences while reducing their environmental impact? New formats, such as online and multisite conferences, may be part of the solution.’<sup>6</sup> *Nature Photonics*, in another editorial published on 27 February 2020, concurred: ‘Should researchers reduce their conference travel, for environmental, personal and financial reasons?’<sup>7</sup>

Pre-pandemic discussions had set the stage for a widespread and forceful advocacy of moving conferences online permanently. Scientists measured the staggering collective carbon footprint of conferencing, caused in particular by air travel:

Estimates of the carbon cost of conferences vary, but range from 0.5 to 2 or more tonnes of carbon dioxide per participant in travel alone. If each of the estimated 7.8 million researchers in the world travelled to one conference every year, the lower bound of the annual carbon emissions would be roughly equivalent to those of small nations.<sup>8</sup>

Another pre-pandemic concern, focusing on inclusivity in the academic world, was integrated in these discussions. Online conferences seemed more accessible to early-career scholars and scientists from less privileged institutions, including in the global South, as well as to parents, carers and disabled scientists.<sup>9</sup>

<sup>2</sup> Chris Woolston, ‘How to love virtual conferences’, *Nature* (4 June 2020) 582, pp. 135–6.

<sup>3</sup> Similar conclusions were drawn from other meetings going online in 2020. Lorena Villanueva Almanza, ‘Virtual scientific conferences open doors to researchers around the world’, *Science*, 25 September 2020, doi: 10.1126/science.caredit.abe9591 (accessed 1 April 2022).

<sup>4</sup> Ariana Rimmel, ‘Scientists want virtual meetings to stay after the Covid pandemic’, *Nature* (11 March 2021) 591, pp. 185–6.

<sup>5</sup> ‘Online meetings for the win. We welcome the move to virtual being the default for scientific interactions’, anonymous editorial, *Nature Ecology & Evolution* (December 2020) 4, p. 1569. See also, within the humanities and social sciences, Sam Robinson et al., ‘Innovation in a crisis: rethinking conferences and scholarship in a pandemic and climate emergency’, *British Journal for the History of Science* (December 2020) 53 (4), pp. 575–90; and other papers in the Forum section of this issue; Emily F. Henderson, *Gender, Definitional Politics and ‘Live’ Knowledge Production: Contesting Concepts at Conferences*, London: Routledge, 2020.

<sup>6</sup> ‘Rethinking conferences’, anonymous editorial, *Nature Reviews Physics* (February 2020) 2, p. 67.

<sup>7</sup> ‘Conference conundrum: does the popularity of a recent online photonics conference signify a growing appetite for change in scientific interaction?’, anonymous editorial, *Nature Photonics* (March 2020) 14, p. 129.

<sup>8</sup> Giuliana Viglione, ‘How scientific conferences will survive the coronavirus shock’, *Nature* (2020) 582, pp. 166–7. See also Adam R.H. Stevens, Sabine Bellstedt, Pascal J. Elahl and Michale T. Murphy, ‘The imperative to reduce carbon emissions in astronomy’, *Nature Astronomy* (September 2020) 4, pp. 843–51; Milan Klöwer, Debbie Hopkins, Myles Allen and James Higham, ‘An analysis of ways to decarbonize conference travel after COVID-19’, *Nature* (16 July 2020) 583, pp. 356–9.

<sup>9</sup> E.g. Woolston, op. cit. (2); Rimmel, op. cit. (4).

## Going virtual, opening the black box

STS and history of science scholarship has shown that the breakdown of well-established paradigms yields debates that make explicit practices and conceptions that otherwise remain under the threshold of conscious awareness. The move to virtual conferencing that took place during the preparation of this special issue was not without its bitter ironies (how were we to carry out a collaborative, international project without meeting in person? Was real-life conferencing disappearing before our very eyes as we set out to study it?), but the interruption of the well-oiled practice of conferencing also harboured heuristic potential for investigating the phenomenon of conferencing, past and present. It revealed much about the tacit dimensions of these activities.

Current debates have, for instance, helped us realize that conferences are valued not only for the presentation and discussion of scientific and technical work but also for informal moments and the exchanges they enable. As one contemporary scientist put it, 'Researchers want to be part of an international conversation, sparking new collaborations and lines of research. Intense discussion, over the unspeakable coffee, is where it happens.'<sup>10</sup> As Thomas Mougey, Geert Somsen and Georgiana Kotsou show for geology and chemistry meetings in this special issue, conferences have historically been expected to perform social, as much as scientific, functions.

Another striking parallel between contemporary discussions and the history of international scientific conferences is the fact that both are characterized by pervasive debates about the structure and function of conferences. As Jessica Reinisch and Thomas Mougey discuss in this volume, since they began taking place on an ever greater scale from the mid-nineteenth century onwards, conferences have been accompanied by passionate debates on the best way to organize them. Though they settled early into a range of recognizable formats, international conferences have nonetheless recurrently been the object of sharp criticism, of calls for reform and of prescriptive manifestos.

At the onset of the pandemic, different actors involved in conferencing similarly grappled not only with the difficulties of planning anything beyond a few weeks' notice, but also about how to rethink the format of the conference in new, exceptional circumstances. They faced not just technical, material, organizational, economic and sanitary issues, but also social and scientific challenges: what can be achieved in different formats? At the bottom line, these discussions were about what conferences do and what they are for. Today's guides to good online conferencing continue the tradition of prescriptive manuals originating in diplomatic contexts as discussed by Jessica Reinisch, while affording fascinating insights into what has, in different times and places, been considered to be good conferencing and how best to achieve it. In criticizing past and present practices and outlining better futures, these writings reveal the values and ideals of both individuals and social groups.

Starting from these insights, I propose to situate contemporary discussions within the history of discourses regarding conferencing and the history of communication technologies and infrastructures. Drawing on the other contributions to this special issue I show that today, as in the past and in imagined futures, technologies of communication and travel have shaped the ways in which presence is mediated and global scientific communities are maintained and performed. This resonates with James Carey's conception of communication that emphasizes ritual rather than transmission, to which I turn in my conclusion.

<sup>10</sup> Jonathan Wolff, 'What hypocrisy, I think guiltily, as I jet off to academic conferences far and wide', *The Guardian*, 29 October 2019.

## The technological infrastructures of conferencing

If physical meetings are impossible or unsustainable but intercourse, in particular informal interaction, is essential, how can the latter be enabled without the former? Solutions proposed today (obviously unavailable during the other major historical interruptions of international conferencing, the two world wars) include mentorship programmes or a combination of in-person and remote participation, for instance through regional hubs. Most often they focus on technological fixes, experimentation and improvement in distant modes of interaction via the Internet, using virtual-reality tools, for instance, with maximum kinaesthetic capabilities, as well as a formalization of, in particular, informal interaction. A scientists' 'community', initially gathered during the pandemic under the aegis of the CSIRO, Australia's national science agency, under the heading TFOM (The Future of Meetings), proposed that

the primary goal of future conference organization should be that attendees have equivalent agency regardless of location. Coming out of 2020, we have seen many claims that hybrid will be the way of future meetings. We contend this is only viable and fair if these meetings are designed to be digital-first. By digital-first, we mean prioritizing the digital means of communication above all other ways of connecting even if there is an in-person component to the event.<sup>11</sup>

The collective concluded, 'While we are still exploring how best to be digital natives, we have seen tremendous progress in virtual communication and collaboration over the last few decades. To have come this far at remote collaboration in such a short time is incredible, and hints at some of the amazing things yet to come.'<sup>12</sup>

Promoters of virtual tools see in them a promise of better collaboration and communication, but these are anything but transparent, immaterial media. Presence at a distance, we have learned – not least through their frequent breakdowns – requires important, reliable infrastructures of telecommunication, such as transatlantic and optical cables, satellites, data centres and software. In enabling a broader access they also potentially alienate persons for whom digital communication is difficult for a range of reasons. The organizers of the pioneering First African Virtual Conference on Bioinformatics in 2009, for instance, acknowledged that bandwidth was a major issue and voiced hope that connections would be improved in the near future with the laying of an optical cable around the coast of Africa.<sup>13</sup> Continuing issues with bandwidth and connectivity should put in perspective the uncritical promotion of online meetings, made by, among others, some conference-organizing businesses that have predictably expressed enthusiasm for technological substitutes to meeting in person (while still heavily investing in in-person meetings and congress centres).<sup>14</sup>

In opposing virtual to in-person conferences, critics of the latter rightly underscore the vastly different carbon footprint of both kinds of meeting. However, they do not usually

<sup>11</sup> Vanessa A. Moss, Matt Adcock, Aidan W. Hotan, Rika Kobayashi, Glen A. Rees, Coralie Siégel, Chenoa D. Tremblay and Claire E. Trenham, 'Forging a path to a better normal for conferences and collaboration', *Nature Astronomy* (March 2021) 5, pp. 213–16.

<sup>12</sup> Moss *et al.*, *op. cit.* (11), p. 214–15.

<sup>13</sup> Nelson N. Gichora *et al.*, 'Ten simple rules for organizing a virtual conference—anywhere', *PLoS Computational Biology* (February 2010) 6(2), pp. 1–4, 3. On the materiality of networks see e.g. Nicole Starosielski, *The Undersea Network*, Durham, NC and London: Duke University Press, 2015.

<sup>14</sup> Thale Jarvis, 'The rapid evolution of virtual scientific conferences' (advertisement feature), *Nature*, at [www.nature.com/articles/d42473-020-00396-2](http://www.nature.com/articles/d42473-020-00396-2) (accessed 20 March 2022). There is a substantial literature on conferences written by or for businesses. See e.g. Judith F. Mair, *Conferences and Conventions: A Research Perspective*, London: Routledge, 2014. I thank Sven Widmalm for this reference.

acknowledge that both conference formats crucially rely on the reach of global technological infrastructures (and that both produce carbon emissions).<sup>15</sup> For it is surely not a coincidence that international meetings began taking place on an ever larger scale from the mid-nineteenth century, just as steamship routes and railway networks began sprawling across the world.<sup>16</sup> This was the material, technological condition of possibility for setting up and maintaining scientific disciplines and organizations at an international level. The evolving map of conference locations is logically patterned on the evolving map of rail and steamship routes, reflecting and reinforcing global imbalances in power and access to these networks.

This did not always go unnoticed. Early congress advocate Simeon E. Baldwin, a US Progressive lawyer, governor and campaigner for ‘the solidarity of the world’, remarked in 1907 that congresses had made a significant contribution to increasing the speed of transport of letters, passengers and goods. Steam transport, modern means of travel, the modern press and telegraph and the telephone ‘have put the world ... on a different footing’. Baldwin made the powerful claim that nations ‘have been brought together by material forces, starting into action greater immaterial forces. Electricity is finishing what steam began. Men come together to breathe a common intellectual atmosphere’. Internationalism and solidarity, in other words, could result from the industrialization of the world, rather than nationalism and war.<sup>17</sup>

International academic life has continued to be shaped and transformed by new communication and travel technologies and infrastructures. In the postwar decades, the jet-setting academic became a stereotype.<sup>18</sup> David Lodge’s infamous satire of academic mores set in 1979, *Small World*, had his character Professor Morris Zapp exclaim,

There are three things which have revolutionized academic life in the last twenty years ... jet travel, direct-dialling telephones and the Xerox machine. Scholars don’t have to work in the same institution to interact, nowadays: they call each other up, or they meet at international conferences. And they don’t have to grub about in library stacks for data: any book or article that sounds interesting they have Xeroxed and read it at home. Or on the plane going to the next conference.<sup>19</sup>

The exponential increase in the number of international conferences over the past 150 years is, then, as much a product of the massification of science, as the continuous growth of the academic community has been described, as of the accelerating industrialization of the world: without railways and steamships, telegraph and postal services, airport hubs and the Internet, international science cannot exist.<sup>20</sup> But this globalization of

<sup>15</sup> Simon Sleight and Toby Green, ‘Historians and sustainability: a working paper’, at <https://rhs150.files.wordpress.com/2019/10/green-sleight-sustainability-working-paper-rhs.pdf> (accessed 20 March 2022).

<sup>16</sup> Yrjö Kaukiainen, ‘Shrinking the world: improvements in the speed of information transmission, c. 1820–1870’, *European Review of Economic History* (2001) 5, pp. 1–28; Ken Alder, ‘Scientific conventions: international assemblies and technical standards from the republic of letters to global science’, in Mario Biagioli and Jessica Riskin (eds.), *Nature Engaged: Science in Practice from the Renaissance to the Present*, New York: Palgrave Macmillan, 2012, pp. 19–39.

<sup>17</sup> Simeon E. Baldwin, ‘The international congresses and conferences of the last century as forces working toward the solidarity of the world’, *American Journal of International Law* (July 1907) 1(3), pp. 565–78, 577.

<sup>18</sup> See e.g. Kristian Björkdahl, Adrian Santiago and Franco Duharte (eds.), *Academic Flying and the Means of Communication*, Singapore: Palgrave Macmillan, 2022.

<sup>19</sup> David Lodge, *Small World: An Academic Romance*, London: Vintage Books, 2011 (first published 1984), p. 43.

<sup>20</sup> France, for instance, went from having five hundred faculty in 1928 to eleven thousand by 1970. Antoine Prost and Jean-Richard Cytermann, ‘Une histoire en chiffre de l’enseignement supérieur en France’, *Le mouvement social* (2010) 233, pp. 31–46. The international conference should, then, be considered a cultural form shaped by the broader history of modernization and globalisation. See Miriam Levin, Sophie Forgan, Martina Hessler,

communication itself depended upon achieving international agreements usually negotiated by scientists gathered at congresses. Scientists, then, contributed to the construction and maintenance of communication networks as much as they relied on them. Today, they participate in research on and implementation of the digital infrastructures that are contributing to the dematerialization of scientific collaboration, or rather its re-mediation in digital forms. With Zoom and Microsoft Teams, we are perhaps now in a further, if not final, stage of what Zapp hailed as ‘the global campus’, when scientists can claim, ‘Going online made it a truly international meeting.’<sup>21</sup> As has been shown for internationalism, science was not exempt from what Paul Edwards and colleagues in their ‘Agenda for infrastructure studies’ describe as the sweeping effect of infrastructure on many areas of life.<sup>22</sup>

### Mediating presence

Conferences are fundamentally about presence. The etymologies of ‘conference’, ‘congress’ and ‘meeting’ in different European languages all involve human bodies gathering in one place and talking, with all the multi-layered and complex dimensions that human interaction usually involves.<sup>23</sup> Crucially, socializing has, historically and now, been invested with functions and values that go beyond simple pleasure or entertainment. In the early twentieth century, it was considered essential by the likes of Baldwin or the chemists and geologists studied here by Thomas Mougey, Geert Somsen and Georgiana Kotsou for promoting mutual understanding. Today, informal talk is seen to fulfil important functions at scientific conferences in encouraging creativity, promoting conference-goers’ careers (‘networking’) or fostering a more democratic and meritocratic academic system.<sup>24</sup> It is often where cutting-edge work is discussed. Tanguy Chouard, an ‘article hunter’ for *Nature*, explained that in looking for new and exciting material, listening to scientists’ talks was less important than hovering in the coffee breaks, speaking informally to scientists, offering to visit their labs and eventually persuading them to publish any breakthroughs in his journal.<sup>25</sup>

This chimes with the views of professional conference organizers. Conference organizing is part of a growing commercial sector, developing so-called solutions for the

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Robert H. Kargon and Morris Low, *Urban Modernity: Cultural Innovation in the Second Industrial Revolution*, Cambridge, MA: MIT Press, 2010; Emily S. Rosenberg, *Transnational Currents in a Shrinking World 1870–1945*, Cambridge, MA: Belknap Press, 2014. It should also be considered part of the transnational history of knowledge circulation. See e.g. John Krige (ed.), *How Knowledge Moves: Writing the Transnational History of Science and Technology*, Chicago: The University of Chicago Press, 2019.

<sup>21</sup> Alistair Forrest, molecular geneticist at the University of Western Australia in Perth and lead organizer of the virtual Human Genome Meeting 2020, quoted in Nic Fleming, ‘What’s on the agenda for post-pandemic meetings?’, *Nature*, 3 August 2020, at <https://doi.org/10.1038/d41586-020-02254-z> (accessed 20 March 2020).

<sup>22</sup> Paul N. Edwards, Geoffrey C. Bowker, Steven J. Jackson and Robin Williams, ‘Introduction: an agenda for infrastructure studies’, *Journal of the Association for Information Systems* (2009) 10, pp. 364–74, 372. On infrastructures and internationalism see Fabian de Kloe, ‘Constructing worlds with words: science and international language in the early twentieth century’, PhD dissertation, University of Maastricht, 2014; S.M. Müller and Heidi Tworek, ‘“The telegraph and the bank”: on the interdependence of global communications and capitalism, 1866–1914’, *Journal of Global History* (2015) 10(2), pp. 259–83; David Brydan and Jessica Reinisch, *Internationalists in European History: Rethinking the Twentieth Century*, London: Bloomsbury, 2021, especially Part I, ‘Communication and infrastructure’.

<sup>23</sup> E.g. the definition of the *Oxford English Dictionary* (Oxford: Oxford University Press, 2020) for ‘congress’ includes ‘The action of coming together (of persons); a meeting, interview’ and ‘The assembling of a society’, as well as ‘Social intercourse, converse’.

<sup>24</sup> E.g. Wolff, op. cit. (10); Q & A, ‘Navigating virtual conferences as a junior researcher’, *Nature Communications*, 7 October 2020, at <https://doi.org/10.1038/s41467-020-18656-6> (accessed 30 March 2022).

<sup>25</sup> Personal communication by Tanguy Chouard, *Nature* senior editor in neuroscience, systems biology and artificial intelligence, 28 February 2019.

organization of work in offices, from acoustics to architecture to ergonomics. In the present-day, it is their job to think about strategies to ensure the efficacy of conferencing.<sup>26</sup> These professionals' concerns echo, perhaps, those of diplomats, who actively promote certain outcomes by engineering spatial and material settings with specific goals in mind.<sup>27</sup> When the contributors to this special issue interviewed Henriette Jensenius, an employee of the Lorentz Center in Leiden whose task is to organize workshops and conferences (albeit a non-commercial entity hosted by a university), she explained that she could tell that a conference was successful from the sound of coffee breaks and the ways in which this sound unfolded, slowly growing to a climax by the end of the conference.<sup>28</sup>

In times of COVID-19, the many perceived benefits of socializing at conferences have led to intense reflection and research into ways of simulating it at a distance. Today's videoconferencing technologies may be seen in a line of imagined devices going back to the late nineteenth century, from Jules Verne's *phonotéléphote* and Mark Twain's 'telectroscope' to E.M. Forster's 'Machine'.<sup>29</sup> By the mid-twentieth century, some of these began to be realized, for instance with AT&T's (commercially unsuccessful) picturephone. Especially significant was the pioneering computing technology for 'online' conferencing developed by Douglas Engelbart and William English in the late 1960s. It rested on an innovative conception of the computer, no longer considered as a calculating engine, but as an interactive technology able to 'augment human intellect', including 'procedures and methods for working individually and cooperatively'.<sup>30</sup> Engelbart worked closely with J.C.R. Licklider and Robert W. Taylor, articulating the vision that led to ARPANET and later to the Internet. They were convinced that in a few years, 'men will be able to communicate more effectively through a machine than face to face':

A communications engineer thinks of communicating as transferring information from one point to another in codes and signals. But to communicate is more than to send and to receive ... we believe we are entering a technological age in which we will be able to interact with the richness of living information ... When minds interact, new ideas emerge ... Creative, interactive communication requires a plastic or moldable medium ... the programmed digital computer. Its presence can change the nature and value of communication even more profoundly than did the printing press and the picture tube ... This kind of communication – through a single multi-access computer with the aid of telephone lines – is beginning to foster cooperation and promote coherence more effectively than do present arrangements for sharing computer programs by exchanging magnetic tapes by messenger or mail.<sup>31</sup>

<sup>26</sup> See e.g. the different room arrangements proposed by the Maison de la chimie in Paris, each implying different kinds of interaction and outcome: <https://congres.maisondelachimie.com/salle/262> (accessed 30 March 2022).

<sup>27</sup> Steven Legg, Mike Heffernan, Jake Hodder and Benjamin J. Thorpe, *Placing Internationalism: International Conferences and the Making of the Modern World*, London: Bloomsbury, 2022.

<sup>28</sup> Personal communication by Henriette Jensenius, Lorentz Center employee, 26 January 2021.

<sup>29</sup> Jules Verne, 'La journée d'un journaliste américain en 2889', *Petit journal*, 29 August 1891 (first published in *The Forum* in February 1889); Iwan Rhys Morus, 'Looking into the future: the telectroscope that wasn't there', *Osiris* (2019) 34, pp. 19–35; E.M. Forster, *The Machine Stops*, London: Penguin Books, 2011 (first published 1909), pp. 1–56.

<sup>30</sup> Douglas C. Engelbart and William K. English, 'A research center for augmenting human intellect', *AFIPS Conference Proceedings of the 1968 Fall Joint Computer Conference* (9 December 1968) 33, pp. 395–410, 395. Engelbart's 1968 demonstration is available online at <https://dougengelbart.org/content/view/276> (accessed 20 March 2022).

<sup>31</sup> J.C.R. Licklider and Robert W. Taylor, 'The computer as communication device', *Science and Technology* (April 1968) 76, pp. 21–9. See Thierry Bardani and Michael Friedenwald, 'Chronicle of the death of a laboratory: Douglas Engelbart and the failure of the knowledge workshop', *History of Technology* (2002) 23, pp. 191–212.

In these early efforts to develop the computer as an interpersonal communication device, it is possible to recognize today's idea that mediated communication via, for example, videoconferencing, enhances face-to-face interaction, improving cooperation and collaboration. Researchers have since pursued this goal, often by combining computing and cognitive science. There was a sense of urgency to this undertaking, put forward by Engelbart *et al.* as a potentially vital contribution to solve the 'recent international crises' related to Cold War tensions that, as Sven Widmalm, Waqar Zaidi and Jenny Beckman show in this issue, were also addressed at the time by means of more conventional meetings.<sup>32</sup>

But here again one should be wary of opposing too quickly in-person versus virtual conferences, or seeing in these developments a progressive replacement of meeting in the flesh by technologically mediated surrogates. Communication technologies are, of course, pervasive at in-person meetings themselves. Conference organizers and attendants have long been avid consumers of new sound amplification devices such as microphones and loudspeakers, and projection apparatus to show lantern slides, plastic overhead slides or Microsoft Powerpoint presentations, which enabled content to be shared with increasing large live audiences, not to speak of the technologies introduced after the Second World War for facilitating instantaneous translation, even down to efforts to automate that process entirely.<sup>33</sup>

If presence is taken in an even wider sense, then we might also consider how distant audiences were also very much targeted by conference makers. As Laura Foster, Thomas Mougey and Sven Widmalm discuss in this special issue, conference organizers often encouraged and carefully managed the coverage of events in the press, on radio and on television. Congress advocate Paul Otlet wrote in 1910, 'Thanks to the Press that can act powerfully on widely disseminated minds, Congresses have also become events that are brought before public opinion and appear among other news items.'<sup>34</sup> Conferences sought to cater to audiences not only across space but also across time, by capturing events for posterity and producing prodigious amounts of documentation, including the established genres of the group photograph and the conference proceedings. And there have even often been remote conference participants, as in the congresses that took place during universal exhibitions of the late nineteenth century, when some scientists and their talks duly appeared in proceedings even though they were never physically present.<sup>35</sup>

Throughout its history, then, conferencing has been about mediating presence, across space and time, by deploying a range of communication technologies, from printing to

<sup>32</sup> Licklider and Taylor, *op. cit.* (31), p. 27. See e.g. Jim Hollan and Scott Stornetta, 'Beyond being there', *ACM*, 1992, pp. 119–25.

<sup>33</sup> Ron Ekers, radio astronomer and former president of the International Astronomical Union, details in an online lecture the changes in projection technology he experienced since the 1960s: Ron Ekers, 'The evolution of scientific meetings', at <https://thefutureofmeetings.wordpress.com/keynotes/#keynote2>, minutes 13–18 (accessed 1 April 2022); Walter Keiser, 'L'interprétation de conférence en tant que profession et les précurseurs de l'Association Internationale des Interprètes de Conférence (AIIC) 1918–1953', *Meta* (2004) 49(3), pp. 576–608; Christian Fügen, Alex Waibel and Muntsin Kolss, 'Simultaneous translation of lectures and speeches', *Machine Translation* (2007) 21(4), pp. 209–52; Michael D. Gordin, *Scientific Babel: How Science was Done before and after English*, Chicago: The University of Chicago Press, 2015, Chapter 8. I thank Jessica Reinisch for some of these references.

<sup>34</sup> Paul Otlet, *L'organisation internationale et les associations internationales*, Brussels: Office central des institutions internationales, 1910, p. 108, my translation. Paul Otlet co-founded the Union of International Associations, which since 1907 has compiled information about congresses. Otlet's work paved the way towards the creation of the International Institute for Intellectual Cooperation, a forerunner of UNESCO.

<sup>35</sup> Joséphine Colic, 'Internationalisme et internationalité dans les congrès d'expositions universelles parisiennes', MA thesis, Strasbourg University, 2022.

audio and visual devices and now to online videoconferencing tools. ‘Presence’ is a more complex experience than one might initially suspect, and it is certainly not an experience necessarily devoid of technological mediation. Jérôme Bourdon has suggested that there have been many historical proxies for telepresence, whether it is understood as an immersion in a space or as a social co-presence, from immersive paintings to the feeling of togetherness created by newspapers or epistolary exchange. It can even include techniques for communicating with the dead. Since before the telegraph and computer-mediated communication and virtual reality, all of which always harboured both promises and frustrations, there has been ‘a whole spectrum of partial presences’ that are arguably intrinsic to human cultures.<sup>36</sup> Since long before contemporary virtual technologies became available, conferencing and scientific life in general have been sustained by tools of mediating presence, from epistolary networks to publishing, telegraphy, means of travel and their successors that have provided the material foundations for scientists to build and maintain their imagined communities.<sup>37</sup> From the early modern Republic of Letters to virtual conferencing, presence at a distance has been a central dimension of scientists’ collective lives, work and identities.

### In conclusion: communication as transmission and as ritual

This perspective can help situate the current soul-searching regarding the future of conferencing and perhaps relativize the novelty of its technological solutions. It can also perhaps lead to a more nuanced understanding of communication in science.

For this we can turn to early communication studies scholar James Carey’s insights into the historical meanings of communication. Carey distinguishes two historical roots of communication, both of which he claims originate in a religious context. First, the ‘transmission view of communication’ came to be embodied from the middle of the nineteenth century by the telegraph, which for the first time ‘broke the identity of communication and transportation’ by allowing an apparent dematerialization of the communication of information. In this view, time and space are overcome, but communication is unidirectional, and in any case leaves little possibility for interaction. Carey notes that the religious undertones of this view survive in the ‘profound possibility for moral improvement’ and control that is invoked in relation to communication machines, from the telegraph to the computer.<sup>38</sup>

In contrast, for Carey, a ritual definition of communication

exploits the ancient identity and common roots of the terms ‘commonness,’ ‘communion,’ ‘community,’ and ‘communication.’ A ritual view of communication is directed not toward the extension of messages in space but toward the maintenance of society in time; not the act of imparting information but the representation of shared beliefs. If the archetypal case of communication under a transmission view is the extension of messages across geography for the purpose of control, the archetypal case under a

<sup>36</sup> Jérôme Bourdon, ‘Telepresence: or, we have always been ghosts, from Cicero to computers’, in Gabriele Balbi, Nelson Ribeiro, Valérie Schafer and Christian Schwarzenegger (eds.), *Digital Roots: Historicizing Media and Communication Concepts in the Digital Age*, Munich: De Gruyter Oldenbourg, 2021, pp. 211–28. On presence in art-works see Hans Belting, *Likeness and Presence: A History of Images before the Era of Art*, Chicago: The University of Chicago Press, 1994.

<sup>37</sup> Benedict Anderson, *Imagined Communities: Reflections on the Origins and Spread of Nationalism*, London: Verso, 1983.

<sup>38</sup> James W. Carey, *Communication as Culture: Essays on Media and Society*, New York and London: Routledge, 2009 (first published 1989), p. 13. This typology is already laid out in Carey, ‘Communication and culture’ (review essay of Clifford Geertz’s *The Interpretations of Cultures*), *Communication Research* (1975) 2(2), pp. 173–91.

ritual view is the sacred ceremony that draws persons together in fellowship and commonality.<sup>39</sup>

For our purposes, Carey's distinction is useful in that it helps to historicize and bring together different ways in which the history of science has considered communication, and by extension how to reconcile different perspectives on conferencing. The much-criticized diffusionist view of scientific communication appears in this light to be rooted in a technological understanding of communication, by analogy with the transport of goods and information – another sign that technology, here by way of metaphor, shapes historical understanding. In contrast, recent efforts to think about communication as circulation are closer to Carey's ritual view that focuses on interaction.<sup>40</sup> Conferences are not only places for the transmission of scientific information but are also codified stages where, to put it in the words of historian of ideas Daniel Rogers, 'ideas must be rethought and rearticulated: given new life and credence outside the circumstances of their generation. What we name, too simply, as the diffusion of ideas disguises an intense and continuous labour of translations, appropriation, re-acquisition, and re-creation'.<sup>41</sup> Like publishing, as recent historians of the book and journal have shown, and as highlighted in all of this special issue's contributions, conferencing not only does essential work in establishing the rules of trust and collective agreement on matters, but also performs critical social and political work across a range of communities.<sup>42</sup> This is why scientists still guiltily want to travel to conferences, and why, perhaps, conferences have been compared to other rituals such as honeymoons.<sup>43</sup> Good conferences are transformative. They do not simply reproduce scientific work, but can change the order of things both scientific and social as well as the participants themselves. That is what makes them memorable.

Carey's ideas were developed in the late 1960s and the 1970s, inspired by John Dewey and – as is evident here – by anthropologists such as Clifford Geertz and Erwin Goffman. They emerged in the period immediately after the Second World War, when a new world order was being reconstructed and when people were urgently preoccupied with the nature of human collaboration and cooperation, particularly within scientific research. Carey's work also displays valences with Engelbart and his colleagues' proposal in the late 1960s that computers and phone lines should be turned into engines of human collaboration. What if these technologies could support not only the transmission of information across space but, more importantly, also the fostering of interpersonal and, by extension, international relations? In this way, conferences could perform the ritualistic kind of communication identified by Carey.

Contemporary discussions about moving international conferences online have been the starting point for this contribution's sketch of the intertwined history of international conferencing and of infrastructures and technologies of communication. In this account, these have appeared as historical determinants for the phenomenon of international conferencing, as bearers of hopes and values for historical actors, as metaphors for historians' understanding of communication itself. But the uses and understandings both of

<sup>39</sup> Carey, *Communication as Culture*, op. cit. (38), p. 15.

<sup>40</sup> James A. Secord, 'Knowledge in transit', *Isis* (December 2004) 95(4), pp. 654–72.

<sup>41</sup> Daniel T. Rogers quoted in Larry S. McGrath, 'Intellectual ambassadors: building peace across the Atlantic in the early twentieth century', *History of Humanities* (2018) 3(1), pp. 159–75, 162.

<sup>42</sup> E.g. Roger Chartier, *Lectures et lecteurs dans la France d'Ancien Régime*, Paris: Seuil, 1987; Anderson, op. cit. (37); Alex Czar, *The Scientific Journal: Authorship and the Politics of Knowledge in the Nineteenth Century*, Chicago: The University of Chicago Press, 2018.

<sup>43</sup> Emily Sohn, 'The future of the scientific conference', *Nature*, 19 December 2018, at [www.nature.com/articles/d41586-018-07779-y](https://www.nature.com/articles/d41586-018-07779-y) (accessed 20 March 2022): 'virtual meetings will replace face-to-face meetings when virtual honeymoons replace face-to-face honeymoons'.

conferences and of communication have not been stable, warranting their study starting from the assumption of Edwards *et al.* that ‘moral and social qualities are ... distributed between people and infrastructure’.<sup>44</sup> We should take this on board when we discuss the future of conferences.

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<sup>44</sup> Edwards *et al.*, *op. cit.* (22), p. 372.

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