



# Absent Balloons? How a Global Germany Contributed to a European Physics of the Atmosphere

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**Franziska Hupfer 2019. *Das Wetter der Nation. Meteorologie, Klimatologie und der schweizerische Bundesstaat, 1860–1914.*** Zurich: Chronos, hardcover, 380 pages, 44 images, 48€. ISBN 9783034015028.

**Linda Richter 2019: *Semiotik, Physik, Organik. Eine Geschichte des Wissens vom Wetter (1750–1850)*** (Series on Discourses of Weakness & Resource Regimes, 8). Frankfurt: Campus, hardcover, 495 pages, 14 images, 45€. ISBN 9783593510743.

**Hannah Zindel 2020: *Ballons. Medien und Techniken früher Luftfahrten.*** Leiden: Brill | Fink, hardcover, 191 pages, 50 images, 39,90€. ISBN: 9783770564514.

In the global history of contemporary meteorological infrastructure, the focus is often on either Cold War computers and satellites or nineteenth-century international organizations (Edwards 2010)<sup>1</sup>. I would like to propose another vital infrastructural project on which the later existence of American and Soviet satellites and computers depended: structural weather balloon campaigns, organized mainly on the European mainland between 1890 and 1933. In those years, the German empire led a group of Eurasian and North American states in establishing a multi-continental network that launched weather balloons to collect data from several layers of the atmosphere. German balloon-propagating meteorologists working in Europe and elsewhere very publicly claimed the air by presenting themselves

as pioneering “aerologists” on both the scientific and diplomatic stage, actively contributing to a distinct “physics of the free atmosphere”. The Frenchman Leon Teisserenc de Bort (1855–1913), working at his private observatory in Trappes near Paris, for example, was only able to put forward his hypothesis of the stratosphere as a new atmospheric layer because of his cooperation with Richard Assmann (1845–1918), working at the Prussian Meteorological Institute in Berlin. Assmann was more successful than Teisserenc de Bort in creating a government institute for what was called “aerology”, the scientific meteorology of the upper air: in 1905, German emperor and Prussian king Wilhelm II inaugurated the Royal Prussian Aeronautical Observatory in Lindenberg, 50 km southeast of Berlin. Similarly, in 1896, Hugo Hergesell (1859–1938), operating from German-occupied France, became the founding president (until 1914) of what would later be known as the International Aerological Commission. The result of a series of internationally coordinated ascents of balloons (mainly in Europe, North America, and a few sites in Asia), Hergesell’s upper air data were of crucial importance for the construction of the first models of numeric weather production (Lynch 2006).

Germany’s international position did not evaporate with the World Wars. A few years after the end of the First World War, Hergesell was again asked to preside over the International Meteorological Organization’s coordinated balloon ascents (Reinbothe 2019). And after the Second World War, German meteorologists moved to the United States or worked to establish modern meteorological institutes across all four (American, British, French and Soviet) German occupation zones. German upper atmosphere physics even moved to the Southern Hemisphere: During the Cold War, German meteorologists played an active role in the World Meteorological Organization’s Global Atmospheric Research Program (GARP) (Weart 2008: 105).

Historians writing in English have long made clear how, in the first half of the twentieth century, several countries in Central and Northern Europe played a large role in expanding the discipline of global meteorology and transforming it into a modeling science of “atmospheric physics” (Friedman 1989; Coen 2018). Yet, in the dominant Anglo-American historiography, the focus has often been on the theoretical contributions by atmospheric physicists from either Scandinavia (the so-called “Bergen School”) or Austria-Hungary (especially critics of the Bergen School). For long time, the global importance of meteorology in Germany was only mentioned as a contrasting “conservative” background story to the theoretical novelties of the Scandinavians.

Of course, it is important to note that before the 1871 unification of Germany, there were no “German” meteorologists; and after unification, no

singular discipline of German meteorology appeared for several decades. “German meteorology” in the late nineteenth century and early twentieth century could be used to refer to weather knowledge work done by a variety of actors: from those engaged within imperial German institutes or the different German states (such as Prussia and Bavaria, working on their own or together in “Northern” or “Southern” alliances *within* the empire); to non-German scientists connected to universities and institutes in Germany; to scientists working in German colonies in Africa and the Pacific; or even to researchers in the larger German-speaking world, including parts of Austria-Hungary and Switzerland and German migrants active in Russia and Argentina (Wille 2017). Taken together, it is perhaps better to speak of a “global Germany”. What united this global Germany was the need to both publish academically in German journals and commit to agendas jointly produced by academic meteorologists in Berlin, Hamburg, Strasburg or Munich. It is this global Germany that is absent from the international historiography of meteorology.

Germany’s invisibility within global meteorology contrasts sharply with the impressive number of histories produced by German meteorologists predominantly in German, as the 13-volume series, *Geschichte der Meteorologie in Deutschland*, published by the German weather service (DWD) demonstrates. But these publications are often biographical, institutional or highly technical in nature and do not place German meteorology in a wider political—let alone global—context. In a way, it is not so much the histories of German and global meteorology that run in parallel, but their historiographies. Luckily, times are changing. The history of science chapter in the 2018 *Palgrave Handbook of Climate History* paid attention to the important role of German meteorologists in the global machine of climate science (Heymann & Achermann 2018). A 2017 special issue in the *History of Meteorology* on the role of empire in the history of meteorology included three contributions on the history of colonial weather and climate science in the German empire (Hardy 2017; Lehmann 2017; Wille 2017). The black box of the “vast machine” of weather and climate science must thus be opened a little further in order to better evaluate the role of the German-speaking world in the history of the atmospheric sciences of weather and climate.

### ***German Meteorology and Balloons: Potential New Approaches***

Three recent monographs can help us create a new agenda for a history of the German-speaking world as a key site for the sudden emergence

of new meteorological infrastructure. They may also help us explain how German balloons suddenly became a structural phenomenon on the global stage and an agent in transforming meteorology “out of nowhere”. From the late Linda Richter, readers learn about the importance of distinguishing between multiple ways of scientific weather knowledge before one can even begin to think about balloons. Her book also helps explain why the German lands were a meteorological hotspot in the 1800s, and why, at the same time, the balloon did not initially break through there. Conversely, Franziska Hupfer focuses on the role of Switzerland, a mountainous state as fragmented as nineteenth-century Germany, but similarly focused on meteorological institutionalization and the upper atmosphere. Here especially, the Alps formed a springboard for ballooning trips. Hupfer also analyzes the role of international cooperation.

However, in order to understand the changes in meteorology at that time, it is necessary to ask more epistemic questions as well. What was needed above all was a specific concept married to a technological structure: to “know” the weather, individuals had to collect multiple data-points—the temperature and humidity at different latitudes, longitudes, altitudes and times of day. This practice of four-dimensional quantified meteorology (what we now call “atmospheric physics”) only emerged in the 1890s and was the result of the collective *ambition* of a heterogeneous collective of scientists to study the “free atmosphere”. Where did this collective ambition come from? The success of meteorological ballooning was perhaps the consequence of an “aerial alliance” between people, balloons and instruments. But what did the balloon contribute to that alliance exactly? Perhaps it is useful to focus on the role of balloons and ballooning *experience* in slowly transforming weather knowledge. In the final section of this essay, I will focus on Hannah Zindel’s study, which sheds light on the importance of studying the history of ballooning and ballooning experience in the creation of new arenas of meteorological knowledge. Whereas the first two reviewed books reside within the domain of the history of science, Zindel’s monograph must be firmly placed within the discipline of media studies, albeit with historical case studies.

### ***Multiple Ways of Knowing the Weather Between 1750 and 1850: Different Points of Departure***

In order to understand the importance of studying the contribution of balloons to weather knowledge, we first need to know how meteorology *without* balloons looked like, in the period around the invention of the

balloon. It is the absence of balloons in Linda Richter's dissertation that forms the ideal point of departure here. Richter shows how people in the German-speaking world read the weather in a different way in the period between the late Enlightenment and the *Vormärz*. The diversity in ways of knowing the weather (*Wissen vom Wetter*) also related to different material cultures. What is very helpful is that she carefully locates German weather knowledge within its European context and compares it to meteorological knowledge cultures in Britain (Jankovic 2000; Golinski 2011), but without creating dichotomies between "ancient" and "modern" traditions. Richter's crucial contribution is that she discerns *three* meteorological knowledge traditions, each with different forms of atmospheric reasoning and often different technologies. It is not a whiggish history, from "traditional to modern" meteorology, but a history of competing and initially equal ways of meteorological knowing.

First, there was a "semiotic tradition", which was *agnostic* toward the sources of causality. German semioticians preferred to read weather signs through the observation of the behavior of non-atmospheric things, such as animals and plants. A second tradition rapidly expanded between 1750 and 1850 and remains the most dominant today: that of weather as "physics", focused on instruments, especially barometers and thermometers. Keeping track of the chain of causality of atmospheric processes became the defining aspect of this way of knowing. Third, Richter describes the organic weather tradition, which included philosophical speculation about the integrity of the system as a whole. Ideas needed to precede empirical research, borrowing from the older tradition of Hippocratic medical meteorology. Wind direction and temperature needed to be brought together with "tides, earthquakes, premature births, diseases, deaths and sunspots" (Richter 2020: 7). This tradition's enduring legacy was its comparative practice. While it shared an appreciation of networks such as the *Societas Meteorologica Palatina* (1781–1792) with the physicist tradition, this tradition's proponents did not attach themselves to a distinct technology. Their goal was above all to find successful medical therapies: they were focused on people. More specifically: they saw the atmosphere as a body that needed to be diagnosed from the ground. Not only does Richter's monograph demonstrate how the history of German meteorology can be enriched by focusing on the larger German-speaking world within its European context, but it also allows us to ask new questions: why was meteorological ballooning picked up so late?

## ***Lack of Meteorological Ballooning Before 1850***

Richter's book does not see a lot of ballooning action. Indeed, Richter's main source, Gustav Hellmann's *Repertorium der deutschen Meteorologie*, only includes five articles (!) with a clear reference to balloons (Hellmann 1883). Only three stand out: the barometric measurements of Christian Gottlieb Reichard produced by a balloon flight in Dresden in 1818 and August Petermann's two articles on the English scientific campaigns of aeronauts Charles Greene and James Glaisher. One explanation for the lack of ballooning might be that meteorological semioticists and physicists were *both* so busy focusing on setting themselves apart from the astronomical sciences that balloons were but far away castles in the air. They increasingly focused on their immediate surroundings in the inhabited world. The organicists, who were most enthusiastic about the atmosphere as a living thing that consumed and reproduced (p. 340), stressed the study of all phenomena and lost themselves in ambitious projects on the ground, sending out questionnaires and convincing governments to collect different types of data.

Only at the end of the nineteenth century did physicists take the lead in studying the upper atmosphere after creating and standardizing a combination of instruments that could measure precisely *and in great quantity*: the *ballon-sonde* carrying an *Aspirationspsychrometer*. Now, meteorologists of a more systemic and holistic bent were suddenly tempted to work together with the "physicists". Perhaps only when the meteorological community unified behind the lead of a unifying *political* faction—the new Germany of 1871 under Prussia—did the balloon become an instrument of interest. Richter's approach deserves a sequel for the period after 1850: we desperately need a historical study of meteorological *Ballonwissen* around 1900, for example. I know that the author was working on a follow-up project—the history of the atmosphere in Germany and the colonies around 1900. Sadly, she passed away in 2022, only 34 years old. She will be dearly missed.

## ***The Emergence of the Balloon in the Late Nineteenth Century***

According to Sabine Höhler's classic study, a social movement for ballooning led to increased state investment in meteorological ballooning campaigns at the end of the nineteenth century (Höhler 2001). Her approach responds to earlier studies on the German romance with aviation and aviation technology by focusing on balloons instead of planes and rockets

(Fritzsche 1992; Trisschler 1992). Höhler reveals how, despite the French Montgolfière brothers' invention of their eponymous hot-air balloon in 1783 (and after nearly a century of purely casual balloon usage by scientists), a popular civil and military movement only emerged in the 1880s and 1890s to create a systemic culture of meteorological ballooning. Yet, the so-called "Berlin Scientific Balloon Flights" [*Berliner wissenschaftliche Luftfahrten*], conducted between 1888 and 1889, also resulted in a *structural* network of upper atmosphere soundings on a transcontinental level. As her research focused on German culture and not on the larger global structures of ballooning, Höhler's work does not go into the reasons behind that development. Moreover, the book ends in the 1910s—the decade that "heavier than air" flight took over the popular and scientific imagination, and meteorologists retreated into government institutions and universities.

A recent monograph on the emergence of atmospheric physics in Switzerland might help us connect the co-evolving spheres of science and the state with the role of international cooperation. In her book, Franziska Hupfer connects mountain station meteorology to both balloon expeditions and sounding balloons, and compares them to other meteorological and climatological practices engaged in between 1860 and 1914, in particular in the years during and after the foundation of the International Meteorological Organization in 1873. Hupfer's main point of reference is Sabine Höhler, who was also involved in Hupfer's dissertation. Where Höhler connected the science of ballooning with the larger movement for "aviation research", contrasting lighter-than-air ballooning with later airplane and glider research, Hupfer places "aerology" firmly in the context of the other meteorological and geophysical sciences. She meticulously analyzes how the Swiss mountain confederacy gradually centralized these sciences, often further accelerating public initiatives sparked by the liberal reforms of 1848. For a state that increasingly identified itself with the mountains, the focus was on useful quantifiable knowledge. In some ways, Hupfer's approach parallels Deborah Coen's, which also centered the mountains of Austria-Hungary as a key site for the history of meteorology and the climate sciences in general, with a special focus on the mountain observatory of Sonnblick (Coen 2018).

Hupfer clearly shows how the Swiss state never held the monopoly on weather knowledge, but always competed with lower levels of bureaucracy, the cantons, scientific societies and the public. And often, the state was itself the desired audience: many activities were not organized by the state but by associations such as the *Schweizerische Naturforschende Gesellschaft*, which in so doing hoped to gain the state's support. The importance of Hupfer's contribution resides in the elucidation of the fact that meteorology's new campaign to conquer the third dimension was not the

result of balloon technology or nationalism alone. Although Hupfer builds on the works of others who have pointed to the major role played by the liberal state and its “trust in numbers” (Porter 2001), she demonstrates how the peculiar interaction between the liberal state and its three-dimensional surroundings—the mountains, glaciers, clouds and winds interacting with each other, creating all kinds of extreme weather—created national and international momentum in the geophysical sciences. Hupfer’s analysis of Swiss climate science in general leaves us with the question of what would happen if someone wrote a history of German atmospheric physics and balloon meteorology in the same way. I would argue that something would still be missing.

### ***Balloons as a Continental Medium and Technology***

Not everything can be explained through a history of interlocking social and national movements, centralizing states and international cooperation. In *Ballons. Medien und Techniken früherer Luftfahrten*, published in 2020, Hannah Zindel considers not only the technologies and media production surrounding ballooning, but also the creation of specific forms of *Raumwissen* and *Wissensräume*. She thus offers historians of meteorology various methodological alternatives with which to study expert practices of sounding the atmosphere. Zindel’s work fits within an emerging “aerial turn” (Horn 2018; Nieuwenhuis 2016; Adey 2015) in media studies, and can be compared in particular to Derek McCormack’s *Atmospheric Things* (2018), published two years earlier. Zindel’s monograph can be also compared to the work of Scandinavian historians and sociologists of environmental science, which discusses “environing media” and “environing technologies” (Wickberg & Gärdebo 2020; Sörlin & Wormbs 2018). Not only does the environment produce knowledge, but knowledge also produces new environments, through new varieties of media and technological advances. It is insufficient to study how Germans and other Europeans picked up and reformed the balloon, one must also study how balloons changed countries and continents.

Zindel compares several famous nineteenth-century European ballooning expeditions, including one fictitious expedition. Interestingly, although she mentions developments in Germany, her chapters are focused on other European countries. In addition to Jules Verne’s now-classic balloon story, she considers the British expeditions by James Glaisher in the 1860s, the postal balloons of besieged Paris in 1870, and Nadar’s aerial photography in the 1850s and 1860s. But the most crucial chapter is on a Swiss expedi-



tion. Just like Hupfer, she devotes a whole chapter to the expedition across the Alps with the Swiss *Wega* balloon, starting from Sion (or Sitten) in the canton of Valais (Wallis).

What makes the *Wega* so interesting for Zindel is that the 1898 Swiss expedition was planned to coincide with launch of sounding balloons at other European observatories. In anticipation, the balloonists visited Hugo Hergesell—in his role as president of the new International Aerological Committee, established two years before in German-occupied Strasbourg—to exchange meteorological instruments and discuss scientific procedures. The “manned” *Wega* expedition became the public face of a new aerology that had become more invisible to the larger public eye. Many European weather balloons that were launched at the same time disappeared from the public imagination the moment they were launched (only briefly returning when they were retrieved and the date put in tables and maps). Conversely, as Zindel shows, the *Wega* expedition also sparked a kind of logistical challenge, in response to which another infrastructural resource proved vital: the telegraph. The many unmanned balloons in Germany, France, and elsewhere had to wait for the manned *Wega* balloon to launch so that the measurements could be completed simultaneously. The moment the weather in the Alps was good enough to travel, the team around the *Wega* balloon could send a message to the other launch sites that it was taking off.

Could balloons have created a new continental dream? From the start, ballooning was never just a national, but also deeply European affair. Ballooning offered additional opportunities for those meteorologists operating at the borders of their countries, such as the Alsatian Prussian-educated Hergesell, who traveled from Strasbourg to Berlin and from Paris to Sion. Zindel offers historians a new perspective by focusing on the complex web of different media. Her *Ballons* is never just about balloons during the nineteenth century: it also features other mediated technologies and infrastructure projects such as popular novels, lithographs, photography, the postal service, traffic in general and military conflict. More so than the historians, she focuses on the modes of representation and how new knowledge practices were created through their mediation.

Taken together, the three monographs offer a window onto the changing geopolitical context of meteorology on the European mainland. This window makes it easier to hypothesize that meteorological ballooning became more successful because it slowly evolved within a larger media and technological ecosystem. Central Europe—with its many small states, political and natural borders, and competing economies and identities—formed an important innovative space for such an ecosystem. Whereas the fragmented landscape around 1800 encouraged a diverse republic of mete-

orological knowledge, by 1900, that fragmented landscape had begun to encourage the growth of empires of atmospheric physics. Something had changed. Maybe, in addition to a new balance of power after 1871, meteorology just needed the telegraph, the unmanned balloon and the new global media as fruitful boundary objects.

Of course, the works of Richter, Hupfer and Zindel have much more to offer than merely leaving room for a future history of German weather balloons. All three monographs contribute to a richer historical picture of meteorological infrastructure in Europe, including the important role of the German-speaking world; all three also provide a good reason for global historians of meteorology to finally start reading German.

### ***Cultures of Remote Sensing***

Today, weather balloons still play a vital role, as does other non-satellite infrastructure, in particular airplanes and airports (Güttler 2023). The COVID-19 pandemic made clear how much we are still dependent on them: when airplanes with meteorological instruments were grounded, newspapers around the world were quick to report on all the *additional* weather balloon launches (Wille 2020). From science and technology studies, we know that infrastructure is successful when it is invisible (Star 1999): were the weather balloons launched predominantly by the German-speaking world so successful that their infrastructure has become invisible to global historians of meteorology? The emergence of weather balloon infrastructure thus forms the ideal instrument with which to reintegrate German meteorology into the global history of meteorology. Future histories of atmospheric physics in the age of weather balloons, between the Franco-Prussian War and the World Wars—not only in Germany, but also the Russian, French, Dutch and Italian empires and even the Ottoman Empire and Japan—must focus on the interactions between both national identity, the state, and the local *milieu*, and international cooperation, the global media and the continental environment. In short, they need to deal with the global *Realpolitik* of weather.

When, in the twentieth century, the action moved from aeronautical societies and the public sphere to government institutions, instrument laboratories capable of launching large numbers of weather balloons, and meteorology departments processing large quantities of data into handbooks, ballooning became an important standard tool, not only in the two Germanies, but also in the two largest continental empires: the United States and the Soviet Union. Unmanned weather balloons had created

a large “impersonal” atmosphere, full of numbers and uniformist expectations. Ultimately, this is a story of an emerging form of *Wetterwissen* decades before the age of computers and satellites: a culture of “collective remote sensing.” That story still needs to be told—especially its German-European dimensions.

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## Endnotes

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## References

- Adey, Peter 2015. Accounting for the Elemental. *Dialogues in Human Geography* (5:1): 98–101.
- Coen, Deborah R. 2018. *Climate in Motion. Science, Empire and the Problem of Scale*. Chicago: University of Chicago Press.
- Edwards, Paul N. 2010. *A Vast Machine. Computer Models, Climate Data, and the Politics of Global Warming*. Cambridge, MA: MIT Press.
- Friedman, Robert Marc 1989. *Appropriating the Weather. Vilhelm Bjerkness and the Construction of a Modern Meteorology*. Ithaca, NY: Cornell University Press.
- Fritzsche, Peter 1992. *A Nation of Fliers. German Aviation and the Popular Imagination*. Cambridge, MA: Harvard University Press.
- Golinski, Jan 2011. *British Weather and the Climate of Enlightenment*. Chicago: University of Chicago Press.
- Güttler, Nils 2023. *Nach der Natur: Umwelt und Geschichte am Frankfurter Flughafen*. Göttingen: Wallstein.
- Hardy, Penelope 2017. Meteorology as Nationalism on the German Atlantic Expedition, 1925–1927. *History of Meteorology* (9):124–144.
- Hellmann, Gustav 1883. *Repertorium der Deutschen Meteorologie. Leistungen der Deutschen in Schriften, Erfindungen und Beobachtungen auf dem Gebiete der Meteorologie und des Erdmagnetismus von den Ältesten Zeiten bis zum Schlusse des Jahres 1881*. Leipzig: Wilhelm Engelmann.
- Heymann, Matthias, and Dania Achermann. 2018. From Climatology to Climate Science in the Twentieth Century. In: Sam White, Christian Pfister, and Franz Mauelshagen (eds.) *The Palgrave Handbook of Climate History*. London: Palgrave Macmillan: 605–632.
- Höhler, Sabine 2001. *Luftfahrtforschung und Luftfahrtmythos: wissenschaftliche Ballonfahrt in Deutschland, 1880–1910*. Frankfurt am Main: Campus.
- Horn, Eva 2018. Air as Medium. *Grey Room* (73): 6–25.
- Jankovic, Vladimir 2000. *Reading the Skies: A Cultural History of English Weather, 1650–1820*. Manchester: Manchester University Press.
- Lehmann, Philipp 2017. Losing the Field. Franz Thorbecke and (Post-)Colonial Climatology in Germany. *History of Meteorology* (9):145–158.
- Lynch, Peter 2006. *The Emergence of Numerical Weather Prediction: Richardson's Dream*. Cambridge: Cambridge University Press.
- McCormack, Derek P. 2018. *Atmospheric Things. On the Allure of Elemental Envelopment*. Durham: Duke University Press.
- Nieuwenhuis, Marijn. 2016. Introduction: Atmospheric Politics and State Governance. *Critical Studies on Terrorism* (9:3): 478–81.

- Porter, Theodore M. 2001. *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*. Princeton: Princeton University Press.
- Reinbothe, Roswitha 2019. *Deutsch als internationale Wissenschaftssprache und der Boykott nach dem Ersten Weltkrieg*. Berlin: De Gruyter.
- Richter, Linda. 2020. 'Forms of Meteorological Knowledge 1750–1850 in German Countries and Beyond', *Wiley Interdisciplinary Reviews: Climate Change*, 11.4
- Sörlin, Sverker, and Nina Wormbs 2018. *Environging Technologies: A Theory of Making Environment*. *History and Technology* (34:2): 101–25.
- Star, Susan Leigh 1999. *The Ethnography of Infrastructure*. *American Behavioral Scientist* (43:3): 377–91.
- Trischler, Helmuth 1992. *Luft- und Raumfahrtforschung in Deutschland: 1900–1970. Politische Geschichte einer Wissenschaft*. Frankfurt am Main: Campus.
- Weart, Spencer R. 2008. *The Discovery of Global Warming*. 2nd edn. Cambridge, MA: Harvard University Press.
- Wickberg, Adam, and Johan Gärdebo 2020. *Where Humans and the Planetary Conflate—An Introduction to Environing Media*. *Humanities* (9:3): 65.
- Wille, Robert-Jan 2017. *Colonizing the Free Atmosphere*. Wladimir Köppen's 'Aerology', the German Maritime Observatory, and the Emergence of a Trans-Imperial Network of Weather Balloons and Kites, 1873–1906. *History of Meteorology* (9): 95–123.
- Wille, Robert-Jan 2020. *Keep Focusing on the Air: COVID-19 and the Historical Value of an Atmospheric Sensibility*. *Journal for the History of Environment and Society* (5): 181–93.

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