

Online end matter for *Air-Borne: The Hidden History of the Air We Breathe* (Dutton, 2025)

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The end matter in the print edition of *Air-Borne* includes endnotes for quoted passages, as well as a list of selected sources for each chapter. This online version provides more detail, including notes for factual statements. The notes are followed by a bibliography that includes all cited sources.

You can find this end matter as a pdf file at <http://carlzimmer.com/airborne>. I have also archived this page on the Internet Archive.

Abbreviations of People

BC: Beulah Chase

CC: Charles Chapin

CW: Charles-Edward Amory Winslow

CL: Charles Lindbergh

ER: Edward Riley

ES: Elvin Stakman

EW: Edwin Wilson

FM: Fred Meier

JS: Joseph Stokes

MW: Mildred Weeks Wells

OR: Oswald Robertson

RC: Roger Crane

RH: Roderick Heffron

RR: Richard Riley

SM: Stuart Mudd

TR: Theodor Rosebury

WW: William Firth Wells

Archival Sources and Abbreviations

APS/JS: Joseph Stokes Jr. Papers. Mss.B.St65p. American Philosophical Society, Philadelphia, PA.

APS/OR: O. H. Robertson Papers. Mss.B.R546. American Philosophical Society, Philadelphia, PA.

CAL: Charles Augustus Lindbergh Papers (MS 325). Selected Correspondences, 1911–1974. Manuscripts and Archives, Yale University Library.

CAL/FM: Correspondence between CL and FM. CAL Box 21, Folder Meier, Fred Campbell.

CC/BU: Charles Chapin Papers. Correspondences, 1901–1939. John Hay Library, Brown University.

CC/RI: Charles Chapin Papers. Mss 343, Series 6. Rhode Island Historical Society.

CWP: Charles-Edward Amory Winslow Papers. General Correspondences, 1897–1957. Box 31. Manuscripts and Archives, Yale University Library.

CF: Commonwealth Fund Records. Rockefeller Archives Center, Sleepy Hollow, NY.

EWP: Edwin Wilson Papers. Box 2, Folder 34. Countway Library of Medicine, Center for the History of Medicine, Harvard School of Public Health.

NAS: National Academies of Sciences–National Research Council Archives: B&A: DNRC: Committee on Aerobiology.

NRC: National Research Council Archives. Committee on Aerobiology. General: 1937–1939.

OHECS: Oral History of E. C. Stakman. Box 1, Folder 9. Elvin C. Stakman Papers, ua-01017. University of Minnesota Archives.

https://archives.lib.umn.edu/repositories/14/archival_objects/348190.

RRP: Richard L. Riley Papers. HMS c363 Accession #2011-131. Countway Library of Medicine, Center for the History of Medicine, Harvard School of Public Health.

TRP: Theodor Rosebury Papers. US National Library of Medicine.

USDA/BPI: USDA, Records of the Bureau of Plant Industry. National Archives, College Park, MD.

USDA/CSA: USDA, Records of the Commissioner and Secretary of Agriculture. National Archives, College Park, MD.

USDA/ES: USDA, Records of the Extension Service. National Archives, College Park, MD.

USDA/WB: USDA, Records of the Weather Bureau. National Archives, College Park, MD.

USGPO: US Government Printing Office, Washington, DC.

WCA: Westchester County Archives, White Plains, New York.

Epigraph

ix Szymborska 2002, p.70.

Prologue: That's Where It Is

xiv a major announcement: World Health Organization 2023b.

xv worst public health disaster of modern times: Covid Crisis Group 2023.

xv “This virus is here”: Quoted in World Health Organization 2023d.

xvii The Centers for Disease Control and Prevention: For an example of CDC guidance, see Hall 2021.

xvii Susanne Jones: Stone 2020.

xvii “Suddenly my annoying allergy symptoms”: Cauvel 2020.

xviii Howard Leibrand: “Local Choir Suffers Devastating Losses.” *Skagit Valley Herald*, March 30, 2020.

xviii “The community should postpone”: Quoted in Skagit County 2020a.

- xix “Individuals should try”: Inslee 2020.
 xx “FACT: #COVID19 is NOT airborne”:
<https://twitter.com/WHO/status/1243972193169616898>.
 xx Covid-19 was airborne: Lazarus et al. 2022; Lewis 2022.
 xxii Hantaviruses: Forbes et al. 2018.
 xxiii Measles: Stockholm et al. 2021.
 xxiii Dolphins: Van Bresse et al. 2014.
 xxiv the aerobiome: *Aerobiome* was first coined by Gordon et al. 2015.

Chapter 1: The Floating Germs

- 3 Louis Pasteur: For Louis Pasteur’s life, see Cavaillon and Legout 2022; Debré 1998; Geison 1995; Vallery-Radot and Devonshire 1902.
 3 “The entire facade”: “Obsequies of Louis Pasteur.” *New York Times*, October 2, 1895.
 4 “Everything gets complicated”: Pasteur to A. Chappuis, August 10, 1860, in Pasteur 1940, p. 73.
 4 Albert Edelfelt: Weisberg and Hansen 2015.
 4 With the help of his guide: Pasteur’s experiment is described in Adler and Dücker 2018; Ariatti and Comtois 1993; Manchester 2007; Pasteur 1864.
 5 Mary Wollstonecraft Godwin and Percy Bysshe Shelley: Nardin 1999; Wilson 2005.
 5 “The immensity of these aerial summits”: Shelley and Shelley 1817, p. 151-2.
 5 “I perceived, as the shape”: Shelley 1823, p. 203.
 5 “the germs that float”: Pasteur 1864.
 5 Anaximenes: Hobza 2020.
 5 “Life and death”: Aristotle 1908, p. 472.
 6 Hippocrates: Jouanna 2012; Zucconi 2019.
 6 The word had existed for generations: Parker 1983; Temkin 1977.
 6 “It attacks everyone”: Quoted in Jouanna 2012, p. 127.
 6 “When the air is full”: Ibid., p. 125.
 7 Robigo: Zadoks 1985.
 7 “Take your rough hands”: Quoted in Palmer 2018.
 7 “For every plant”: Quoted in Hughes 1985, p. 298.
 7 “Lands which are exposed”: Hort 1916, p. 203.
 8 the plague: Conrad 1982.
 8 Baghdad: Fancy and Green 2021.
 8 “This caused a severe epidemic”: Quoted in Dols 1977.
 8 “Since it is civil”: Quoted in Geltner 2020, p. 18.
 8 seemed useless: Arrizabalaga 1994.
 8 “The art of Hippocrates”: Quoted in Cohn 2007, p. 10.
 9 mange: Aberth 2011.
 9 Qusṭā ibn Lūqā: Gari 2002; Swanson 2010.

- 9 “Infection is a spark”: Quoted in Stearns 2011, p. 71.
- 9 cities tried to prevent: Kinzelbach 2006.
- 9 the Major Council of Dubrovnik: Blažina-Tomić and Blažina 2015.
- 9 Thus the quarantine was born: Sehdev 2002.
- 10 leather masks: Ruisinger 2020.
- 10 cinnamon, cloves, and opium: Mussap 2019.
- 10 Girolamo Fracastoro: Beretta 2003; Henderson 2019; Howard-Jones 1977.
- 10 “born amid squalor”: Fracastoro 1984, p. 55.
- 10 “It was necessary”: Greenwood 1927, p. 465.
- 10 *On the Nature of Things*: Greenblatt 2011.
- 11 “There are many seeds”: Lucretius 1924, p. 575.
- 11 “so very varied”: Fracastoro 1984, p. 53.
- 11 “The air is the most suitable”: Fracastoro 1930, p. 57.
- 12 gradually abandoned it: Nutton 1990.
- 12 Antonie van Leeuwenhoek: Robertson 2022; Wilson 1995.
- 12 contagionists: DeLacy 2017; Pastoret et al. 2006.
- 12 “Mankind, Quadrupeds and Plants”: Bradley 1721, p. 47-8, 57.
- 12 Richard Bradley: Egerton 2006.
- 13 Newgate Prison: Buckland 2022; Hales 1752.
- 13 “the wholesome breath”: Quoted in Evans 2011, p. 100.
- 13 “unwholesome atmosphere”: Rush 1789, p. 90.
- 13 “Philadelphia, from having been”: *Ibid.*, p. 86.
- 13 “The first cases”: Quoted in McFarland 1929, p. 454.
- 14 “the miasmata from our atmosphere”: Benjamin Rush to Thomas Jefferson, August 29, 1804.
<https://founders.archives.gov/documents/Jefferson/01-44-02-0289>.
- 14 “A new era”: Quoted in Apel 2016, p. 144.
- 14 “Like a primal fixed star”: Staughton 1813, p. 24.
- 14 “He has done”: Quoted in Brodsky 2004, p. 365.
- 14 anticontagionists: Ackerknecht 2009.
- 14 roundly condemned contagionism: Brown 2008.
- 14 Charles Maclean: Mullett 1952.
- 14 “little short of willful murder”: Quoted in *ibid.*, p. 523.
- 14 “This unknown and incomprehensible power”: Maclean 1824, p. 208.
- 14 Christian Gottfried Ehrenberg: Dolan 2022; Krumbein 1995; Natural History Museum 2013; Sarjeant 1978; Williams and Huxley 1998.
- 15 “Of small things”: Quoted in Grote 2022, p. 2.
- 15 paper meteorites: Ehrenberg 1839.
- 15 “How many thousand millions”: Ehrenberg 1849, p. 57.
- 16 “the falling of impalpably fine dust”: Darwin 1909, p. 14.

- 16 “I am truly astonished”: Darwin to Ehrenberg, July 4, 1844.
<https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-760.xml>.
- 16 “I will feast”: Ehrenberg to Darwin, July 11, 1844.
<https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-762.xml>.
- 16 published an account: Darwin 1846.
- 17 “proved the actual existence”: Cunningham 1873, p. 2.
- 17 Ireland: Woodham-Smith 1962.
- 17 a third of the country’s population: Connolly 2022.
- 17 a fierce scientific debate: Matta 2010.
- 17 a water-mould: Egerton 2012. The modern name for the cause of late potato blight is *Phytophthora infestans*.
- 17 “destruction by absorption of miasm”: *Gardeners’ Chronicle*, September 5, 1846, p. 595.
- 18 spontaneous generation: Farley 1977.
- 18 Miles Berkeley: Nelson 1983; Nelson and Ristaino 2011.
- 18 “The decay is the consequence”: Berkeley 1846, p. 23.
- 18 Anton de Bary: Turner 2005.
- 18 “are wafted about”: Quoted in Berkeley 1857, p. 258.
- 19 spoiled beet juice: Lecerf 2023.
- 20 “Their presence is always”: Quoted in Cavaillon and Legout 2022, p. 2.
- 20 “unfair, arrogant, haughty”: *Ibid.*, p. 1.
- 20 “The most brazen plagiarist”: *Ibid.*, p. 2.
- 20 “Where do they come from”: Quoted in Debré 1998, p. 148.
- 20 The late potato blight: Pouchet’s anticontagionism is mentioned in Berkeley 1846.
- 21 “Spontaneous generation is the production”: Quoted in Debré 1998, p. 157.
- 21 a public spectacle: Roll-Hansen 1979.
- 21 “The world into which”: Quoted in Vallery-Radot 1902, p. 99.
- 22 “The air in which”: Quoted in Debré 1998, p. 163.
- 23 “gives us the indubitable proof”: Pasteur 1922, p. 204.
- 24 The Sorbonne: All quotations from the 1864 lecture are from Pasteur 1922, p. 328-46.

Chapter 2: The Sanitarians

- 26 “They sometimes carry”: Pasteur 1922, p. 338.
- 26 Joseph Lister: Fisher 1977.
- 27 “simplicity and perfect conclusiveness”: Lister 1909, p. 486.
- 27 “some material capable”: Lister 1867, p. 246.
- 27 “I do not think”: Quoted in Debré 1998, p. 278.
- 28 Max von Pettenkofer: I based my account of his life on sources including Bencko 2018; Evans 1973; Hume 1927; Locher 2007.
- 28 “No living epidemiologist”: Von Pettenkofer 1887.
- 28 “was known throughout”: “Max Josef von Pettenkofer.” 1901. *Nature* 63:399.

- 28 “*das Cholera-Miasma*”: Von Pettenkofer 1855, p. 104.
- 28 “the monster”: Snowden 2020, p. 235.
- 28 only gained the world’s attention: Pollitzer 1959; Shah 2016.
- 29 “It can scarcely be necessary”: Maclean 1824, p. 425.
- 29 John Snow: Johnson 2006; Koch 2008.
- 29 “The evidence brought forward”: Westminster Medical Society 1832, p. 150.
- 29 It suddenly killed 918 residents: Kisskalt 1948, p. 39.
- 30 “inhaled poison”: Snow 1849, p. 4.
- 31 “I have disposed”: Quoted in Winslow 1967, p. 314.
- 31 “It looked as if”: Quoted in Kisskalt 1948, p. 44.
- 32 “We live in the air”: Von Pettenkofer 1875, p. 51.
- 32 “Cleanliness acts as a deterrent”: Von Pettenkofer 1884b, p. 771.
- 33 “It is possible by increasing”: Von Pettenkofer 1875, p. 52-3.
- 33 Indoor pollution: Von Pettenkofer 1873.
- 33 sanitarians: Duffy 1990; Fairchild et al. 2010.
- 33 “a great laboratory”: Quoted in Duffy 1968, p. 113.
- 34 “Suffice it to say”: Nightingale 1863, p. 9.
- 34 the architecture of houses: Klauss et al. 2011.
- 34 forty-six thousand windows: Blake 1948.
- 34 an international consensus: Richmond 1954.
- 34 At cholera conferences: Howard-Jones 1975.
- 34 “drinking-water faith”: Quoted in Howard-Jones 1973, p. 103.
- 35 silkworms: Davidson 2012.
- 36 Robert Koch: Blevins and Bronze 2010; Brock 1999; Jones 2010.
- 36 “They looked like”: Koch 1987, p. 5.
- 37 Jacob Henle: Howard-Jones 1977.
- 38 “The man has made”: Quoted in Brock 1999, p. 46.
- 38 tuberculosis: Kaufmann and Schaible 2005.
- 38 one in seven humans: Koch 1987, p. 83.
- 38 Koch’s postulates: Carter 1985.
- 39 Damietta: Rose 2020.
- 39 The British soldiers: Ogawa 2000.
- 39 “who do not believe”: Hunter 1884, p. 93.
- 40 the comma bacillus: Coleman 1987.
- 41 “Koch’s discovery of the comma bacillus”: Quoted in Howard-Jones 1973, p. 104.
- 41 “If a weather storm”: Von Pettenkofer 1884a, p. 993.
- 41 Hamburg: Evans 2005; Morabia 2024.
- 42 melting Arctic icebergs: Evans 2005, p. 234.
- 42 “I felt as if”: Quoted in *ibid.*, p. 312.
- 42 a germ-driven disease: Baldwin 1999.

- 42 1.34 percent: Morabia 2024.
- 43 blamed the disaster in Hamburg: Von Pettenkofer 1892.
- 43 his performance: Ibid.
- 44 “Herr Doktor Pettenkofer”: Quoted in Sherman 2020, p. 165.
- 44 “we could guess”: Quoted in Kisskalt 1948, p. 118.
- 45 “Thus, it is probable”: Koch 1987, p. 94.
- 45 doctors urged housewives: Tomes 1999.
- 45 making spitting in public a crime: Cochran 2020.
- 46 “The dissemination of germs”: Flügge 1897, p. 213.
- 47 an operating room: Strasser and Schlich 2020.
- 47 Johannes Mikulicz: Schlich and Strasser 2022.
- 48 Charles Chapin: Cassedy 1962; Terris 1999.
- 48 “Air was the chief vehicle”: Chapin 1934, p. 14.
- 48 “The most natural explanation”: Chapin 1908, p. 2048.
- 48 “A bundle comes home”: Quoted in “Well Men May Carry Diseases.” *Boston Post*, March 27, 1911. CC/RI, Box 13, vol. 30.
- 48 “Many a lifelong infection”: Quoted in “Tells of Contagion in Personal Contact.” *Providence Journal*, March 27, 1911. CC/RI, Box 13, vol. 30.
- 48 “The breath of a patient”: Quoted in “Stop Kissing, Keep Healthy.” *Boston Evening News*, March 27, 1911. CC/RI, Box 13, vol. 30.
- 48 spray-borne: Chapin 1908.
- 49 “They have not wings”: Quoted in “Well Men May Carry Diseases.” *Boston Post*, March 27, 1911. CC/RI, Box 13, vol. 30.
- 49 pulled the trigger: “Prof. Pettenkofer a Suicide.” *New York Times*, February 11, 1901.
- 49 “The death of Professor Pettenkofer”: “Max von Pettenkofer.” *Lancet* 157(4042):490-1.
- 49 “Pettenkofer and his teaching”: Greenwood 1935, p. 60.
- 49 “To men of this generation”: “Pettenkofer and His Theory.” 1935. *Br Med J* 2(3897):518.
- 49 a classic of the field: Rosen 1963.
- 49 “It will be a great relief”: Chapin 1910, p. 264.
- 50 “I believe that perhaps”: Quoted in “Dr. Chapin Paid Greatest Honor by Contemporaries.” *Providence Journal*, April 16, 1930.

Chapter 3: A Watermelon Doctor

- 51 Charles Lindbergh: My account of the Lindberghs is based on sources including Berg 1998; Friedman 2008; Herrmann 1992; Hertog 1999; Lindbergh 1978.
- 51 “They have flown so much”: Owen 1933.
- 52 Supplies were loaded: Weems 1934.
- 52 “We circle and circle”: Lindbergh 1974, p. 46.
- 52 “the government’s ace-spore hunter”: “Flying Scientist Chases Spores.” *El Paso Herald-Post*, May 12, 1933.

- 53 Pierre Miquel: Comtois 1997.
- 54 “There are too few scientists”: Miquel 1883, p. vii.
- 54 “an inference made yesterday”: Ibid., p. vi.
- 54 “The micrographer who has leisure”: Quoted in Gregory 1961, p. 10.
- 54 “I have succeeded”: Miquel 1883, p. vii.
- 54 Charles Harrison Blackley: Taylor and Walker 1973.
- 55 “When I had got”: Quoted in Blackley 1873, p. 43.
- 55 “A small cloud of pollen”: Ibid., p. 44.
- 55 one of Pasteur’s tricks: Blackley 1873, p. 118.
- 56 some unexpected fan mail: Lownes 1947.
- 56 “The power of pollen”: Darwin to Blackley, July 5, 1873.
<https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-8965.xml>.
- 56 “Hay-fever is essentially a neurosis”: Quoted in Waite 1995, p. 193.
- 56 Microbiologists had their own objections: MacPhail 2023.
- 57 “Absolute *silence* reigns supreme”: Glaisher 1871, p. 147.
- 57 Hector Cristiani: Cristiani 1893; Cristiani 1895; Soret 1896.
- 57 Eduard Spelterini: Mangold 2019.
- 57 Otto Lilienthal: Lemelson-MIT n.d.; Reichhardt 2016.
- 58 “What goes on up in the air?”: OHECS, vol. 7, p. 1350.
- 58 Elvin Stakman: Christensen 1992; Mann 2018; OHECS; Rensberger 1979.
- 58 lost up to half their harvest: Olmstead and Rhode 2002.
- 58 “The terrible devastation”: Stakman 1937, p. 118.
- 59 its huge harvest: Fullilove 2017.
- 59 keep Allied soldiers well fed: Bennett 1939.
- 59 “This epidemic of late blight”: Quoted in Garnett 2021, p. 113.
- 59 its advantage in food: Trenholm 2012.
- 60 “We don’t know”: OHECS, vol. 2, p. 270.
- 60 “This barberry bush”: Quoted in Peterson 2013.
- 60 “Thousands of bushes”: Stakman 1919, p. 100.
- 60 “If there was”: OHECS, vol. 7, p. 1345.
- 61 dozens of flights: Stakman and Christensen 1946; Stakman et al. 1923.
- 61 the summer of 1915: Meier 1916.
- 61 spend the afternoon fishing: Haskell and Barss 1939.
- 62 “The 8 checks”: Meier 1916, p. 151.
- 62 “This piece of research”: Harvard College 1922, p. 293.
- 62 “to be of as much service”: Ibid., p. 294.
- 62 a full-time job: Meier’s positions at USDA are recorded on his service card. Fred C Meier; Official Personnel Folders-Department of Agriculture; RG 146: Records of the U.S. Civil Service Commission; National Archives, St. Louis.
- 62 a PhD at Harvard: Haskell and Barss 1939.

- 62 “In March 1918”: Harvard College 1922, p. 293.
- 62 a watermelon doctor: Ibid., p. 294.
- 63 Meier’s arrival in Florida: “Man from Department of Agriculture Here to Learn What Ails Melons.” *Miami News*, April 8, 1918.
- 63 “weakling parasite”: Orton and Meier 1922, p. 21.
- 63 crisscrossed the United States: See, for example, “Nevada Potatoes Win High Praise.” *Reno Gazette-Journal*, July 30, 1923; “Plant Pathologist on Tour.” *Spokesman-Review*, July 12, 1925.
- 63 traveled more than anyone: FM to W. P. Cox, December 24, 1935. USDA/BPI, RG 33, Extension Service, Entry PI-83 3, General Correspondence, Box 371.
- 64 taught fruit inspectors: Haskell and Barss 1939.
- 64 urged farmers: Meier 1924.
- 64 go on the radio: Meier 1930.
- 64 18 million barberry bushes: Meier and Popham 1932.
- 64 “Excellent progress has been made”: Meier 1933.
- 64 Meier’s task: Meier 1931.
- 64 “To an increasing degree”: Meier and Popham 1932.
- 64 “Too often have farmers”: Meier 1933.
- 64 Stakman persuaded Meier: Haskell and Barss 1939.
- 65 charmed his way: Smith 1938.
- 65 “The crew of the *Los Angeles*”: Meier 1933.
- 65 dozens of species: Meier, Stevenson, and Charles 1933.
- 65 “Judging from our success”: Meier 1933.
- 66 “ridiculed the idea”: FM to Anne M. Lindbergh, February 23, 1935. CAL/FM.
- 66 Pan American Airways: Van Vleck 2013.
- 66 flying boats: C. Lindbergh 1978, p. 108.
- 66 “girl-meeting project”: Quoted in Friedman 2008, p. 46.
- 66 Anne Morrow: Lindbergh 1974; Strohlic 2020.
- 66 “baseball-player type”: Quoted in Hertog 1999, p. 32.
- 66 disgusting Charles: Horrigan 2002.
- 67 “I was spellbound”: C. Lindbergh 1978, p. 129.
- 67 Alexis Carrel: Friedman 2008.
- 67 “In Carrel”: C. Lindbergh 1978, p. 17.
- 68 “attempting to build”: Ibid.
- 68 toward the Arctic: Cochrane 2021.
- 68 “You could evade”: C. Lindbergh 1978, p. 108-9.
- 68 A mechanical engineer: A selection of 1934 letters found in CAL Box 46.
- 68 tolerate no publicity: William Taylor to Henry Wallace, n.d. RG 16, USDA/RSA 16, Entry PI-191 17, General Correspondence, 1933, Location 170/6/7/5 Box 1748, Aeronautics-Aeroplanes.

- 69 “an extremely simple device”: CL to Arthur Train Jr., May 12, 1938. CAL, Box 36, Folder 1938 May 10-14.
- 69 “While it is realized”: Henry Wallace to CL, July 5, 1933. USDA/RSA, RG 16, Entry PI- 191 17, General Correspondence, 1933, Location 170/6/7/5.
- 70 “That dreadful ache”: A. Lindbergh 1974, p. 47.
- 70 “Very bad for you”: Quoted in Herrmann 1992, p. 130.
- 70 “The mountains towered”: A. Lindbergh 1934.
- 71 “This may be sufficient”: Meier 1935, p. 27.
- 71 “He had a brief”: Quoted in “Lindberghs Safe, No Plane Crash.” *Corvallis Gazette-Times*, August 11, 1933.
- 71 the entrance of Copenhagen Harbor: “Lindberghs Hailed in Danish Capital.” *New York Times*, August 27, 1933.
- 71 “Lindy & Ann Home Again!”: British Pathé 1934.
- 71 twenty-six slides: “‘Skyhook’ on Lindbergh Plane Traps Spores Menacing Crops.” *Washington Post*, December 24, 1934.
- 71 Civilian Conservation Corps: FM to CL, December 20, 1933. CAL/FM; FM to W. P. Cox, December 24, 1935. USDA/ES, RG 33, Entry PI-83 3, General Correspondence, Box 371.

Chapter 4: Ethereal Space

- 72 A Century of Progress International Exposition: Ganz 2008; Rydell 1985.
- 72 The craft: “Big Balloon Filled for Settle Ascent.” *New York Times*, August 5, 1933; Science Service 1933.
- 72 Léon Teisserenc de Bort: McAdie 1934.
- 73 cosmic rays: “The Origin of the Cosmic Ray: Science Attacks Basic Problem.” *New York Times*, January 10, 1932.
- 73 Auguste Piccard: “Fails to Ascend into Stratosphere.” *New York Times*, September 15, 1930; “Piccard is Safe in Tyrol; Balloon Lands on Glacier After Rise of 52,462 Feet.” *New York Times*, May 29, 1931.
- 73 “Here our ascent”: Piccard 1931.
- 73 He picked out rust: “Fungus Spores Didn’t Die in the Stratosphere.” *Boston Globe*, November 28, 1933.
- 73 a gargantuan jellyfish: Universal Studios 1933.
- 73 a nearby rail yard: “Flight into Stratosphere Ends Abruptly as Valve Sticks and Releases Gas.” *Chippewa Herald-Telegram*, August 5, 1933.
- 73 Major Chester Fordney: “C. L. Fordney, Shared ‘33 Altitude Record.” *New York Times*, May 27, 1959.
- 73 the balloon carried the two men: “Pilots and Planes: Settle’s Balloon Rises Eleven Miles.” *Newsweek* 2(17):26.
- 74 a New Jersey swamp: “Balloon Missing After 11-Mile Rise in Stratosphere.” *New York Times*, November 21, 1933.

- 74 “The problem was settled”: FM to CL, December 20, 1933. CAL/FM.
- 74 “It was the first time”: “Fungus Spores Didn’t Die in the Stratosphere.” *Boston Globe*, November 28, 1933.
- 75 “Your slide exposures”: FM to CL, December 20, 1933. CAL/FM.
- 75 “Definitive evidence has been obtained”: Meier and Lindbergh 1935.
- 75 “Could you find time”: FM to CL, December 20, 1933. CAL/FM.
- 75 “We have made”: FM to Anne M. Lindbergh, February 6, 1934. CAL/FM.
- 76 “A tremendous amount”: FM to M. A. McCall, May 3, 1935. USDA/ES, RG 33, Entry PI-83 3, General Correspondence, Box 293, Folder- Plant Industry, 7-1-34 to 6-30-35.
- 76 “Adjoining countries may have”: C. W. Warburton, May 29, 1935. Memorandum for Mr. F. D. Richey. USDA/ES, RG 33, Entry PI-83 3, General Correspondence, Box 293, Folder- Plant Industry, 7-1-34 to 6-30-35.
- 76 giant box-shaped kites: National Weather Service n.d.
- 76 a small fleet of biplanes: Fleming 1996.
- 76 “that Mr. F. C. Meier shall serve”: Memo to Willis Gregg, August 10, 1934. USDA/WB, RG 27, Entry NC3 50, General Correspondence, 1912-42, Box 3001, Decimal 070.1.
- 77 *Explorer*: “The National Geographic Society-U.S. Army Air Corps Stratosphere Flight of 1934 in the Balloon ‘Explorer.’” *Natl Geogr Soc Stratosph Ser*, vol. 1, 1935.
- 77 Stratobowl: Kaempffert 1934b; Newcott 2020.
- 77 burst into vapor: Lyman 1934.
- 77 “The weather was ideal”: Quoted in Stevens 1934.
- 80 “Results were somewhat inconclusive”: Meier 1936b.
- 80 “All came back”: Stevens 1934.
- 80 “an unusual botanical collecting trip”: Meier and Lindbergh 1935, p. 5.
- 80 “A vast unseen world”: “Lindbergh’s Arctic Flight Proved Bacteria Travel in Air Across Sea.” *New York Times*, December 24, 1934.
- 81 “In the brave days”: “Germs and Winds.” *New York Times*, December 25, 1934.
- 81 he pitched Lindbergh: FM to Anne M. Lindbergh, February 23, 1935. CAL/FM.
- 82 “Have told him”: CL to FM, April 22, 1935. CAL, Box 34, Folder: 1935 Jan-Aug.
- 82 a two-week voyage: FM to M. A. McCall, May 3, 1935. USDA/ES, RG 33, Entry PI-83 3, General Correspondence, Box 293, Folder- Plant Industry, 7-1-34 to 6-30-35.
- 83 Bureau of Plant Industry: Stevenson 1954.
- 83 “As the Bureau considers”: F. D. Richey to C. W. Warburton, May 20, 1935. USDA/ES, RG 33, Entry PI-83 3, General Correspondence, Box 293, Folder- Plant Industry, 7-1-34 to 6-30-35.
- 83 “at such time”: C. W. Warburton to F. D. Richey, May 29, 1935. USDA/ES, RG 33, Entry PI-83 3, General Correspondence, Box 293, Folder- Plant Industry, 7-1-34 to 6-30-35.
- 83 *Explorer II: Natl Geogr Soc Stratosph Ser*, vol. 2, 1936.
- 83 Meier constructed quartz tubes: “Double Parachute and Sterile Tube Will Be Used to ‘Fish’ for Spores in Stratosphere Flight.” *Weekly Pioneer-Times*, April 18, 1935; “Hunt Life in

Stratosphere.” *Sandusky Register*, April 12, 1935; “Stratosphere Flying Is Old Story to Tiny Living Spores.” *Rapid City Journal*, May 29, 1935.

84 “first attempt to explore”: Rogers and Meier 1936, p. 151.

84 *Enterprise*: “Trap Perfected to Bag Spores of Plant Disease in Upper Air.” *Washington Post*, April 11, 1935.

84 “Camp life, even in heated tents”: Quoted in Stevens 1936.

85 “Plant Diseases Live 13 Miles Up”: *New York Times*, November 26, 1935.

86 “Perhaps we see from the results”: Rogers and Meier 1936, p. 151.

86 life beyond Earth: “Life Beyond This Earth.” *Intelligencer Journal*, November 30, 1935.

86 “Scientists have debated”: “New Evidence of Life Upon Planets Bared.” *Miami Tribune*, November 26, 1935.

86 a foray over the Caribbean: Meier 1936a.

87 Amelia Earhart: “Earhart Tragedy Research Loss.” *Times Colonist*, August 7, 1937.

87 Meier’s network: See Moulton 1942 for Proctor, ZoBell, and other early aerobiologists.

87 “the extent to which”: FM to Secretary of Agriculture, October 25, 1937. USDA/RSA, RG 16, Entry PI-191 17, General Correspondence, 1937, Location 170/6/23/3. Box 2528, Committees.

87 the council agreed: Report of the National Research Council for the Year July 1, 1937 to June 30, 1938. 1939. USGPO.

87 “Miss Earhart, in this phase”: Quoted in “Earhart Plane Loss Stays Collection of Microorganisms,” *Science News*, August 9, 1937.

88 the committee gathered: Committee on Aerial Dissemination of Pathogens and Allergens. Minutes of meeting of November 12, 1937. NAS, Meetings: 1937-1938.

88 Earl McKinley: Karsner 1938; McKinley 1934.

89 Laboratories for the Study of Air-borne Infection: University of Pennsylvania 1937.

89 “The Doctors Wells”: Of the two Wellses, it’s worth noting only Mildred was a doctor.

89 an ambitious plan: Outline for Special Research Project-Six Months Duration-July, August-1938-March, April, May, June, 1939. Department of Agriculture, Project No. SRF-2-6.

91 a picture of William Wells: FM to Esmond R. Long, January 4, 1938. NAS, General 1937-1939.

Chapter 5: A Perfect Cycle

92 William Firth Wells: Some details of William’s career can be found in Fitzgerald 2003 and Fitzgerald 2021. The Commonwealth Fund Archives have a wealth of memos and reports about the Wellses that fit together like pieces of an incomplete jigsaw puzzle.

92 William Sedgwick: Cassedy 1962; Couch 2015.

92 bad weather: Christison 1846; Cumbler 2001, p. 134; Sedgwick 1902, p. 358.

92 *Salmonella*-laced sewage: Sedgwick 1891.

92 “scare us to death”: Whipple 1921, p. 75.

- 92 he would still remember: WW to RC, September 14, 1952. CF, Series 13.9, Box 68, Folder 815.
- 92 “He strove to inspire”: WW to Geddes Smith, March 28, 1941. CF, Series 13.9, Box 68, Folder 813.
- 93 “the most thoughtful”: Sedgwick to CC, October 28, 1902. CC/BU, Box 1, 1901-1913, Folder 3.
- 93 “I consider it”: Sedgwick to CC, April 3, 1913. CC/RI, Box 10, Vol. 10.
- 93 “Any thoughtful student”: Sedgwick to CC, October 28, 1902. CC/BU, Box 1, 1901-1913, Folder 3.
- 93 Greenleaf Tucker: Tucker 1890.
- 93 “This is as it should be”: Ibid., p. 84.
- 93 a portable kit: WW to BC, March 14, 1954. CF, Series 13.9, Box 68, Folder 816; W. F. Wells 1918.
- 94 low-level jobs: WW to Sedgwick, September 10, 1912. William Sedgwick Papers, Yale Manuscripts and Archives, Box 1, Folder 6, Correspondence 1911-1912.
- 94 settling in Washington, DC: W. F. Wells 1913.
- 94 outbreaks of typhoid fever: Williams 1951, p. 328.
- 94 the Potomac River: Cumming 1916.
- 94 “Grave danger exists”: “Oysters Under Fire From U.S. Attorney.” *Washington Times*, October 8, 1910, p. 1.
- 94 how to purify oysters: W. F. Wells 1916.
- 94 “He did excellent work”: Wade H. Frost to Barbara S. Quin, September 11, 1937. CF, Series 18, Box 269, Folder 2566.
- 94 “paranoiac”: Quoted in Lester G. Evans, September 17, 1937. Interview with Earle B. Phelps. CF, Series 18, Box 269, Folder 2566.
- 94 hired a young doctor: Esmond R. Long, JS, and SM, August 4, 1937. A Project for Further Study of the Prevention and Control of Air-Borne Infections. CF, Series 200, Box 20, Folder 233.
- 94 married in a small April ceremony: WW, June 9, 1931. Personal History Record. CF, Series 200, Box 20, Folder 233; “Society.” *Washington Post*, April 12, 1917, p. 7.
- 94 William Wells Jr.: U.S., Social Security Numerical Identification Files (NUMIDENT), 1936-2007.
- 94 drafted into the army: U.S. World War I Draft Registration Cards, 1917-1918.
- 95 hastily threw up camps: Setzekorn 2022.
- 95 Scarlet fever, diphtheria, mumps, and measles: Capps 1918a; Capps 1918b.
- 95 “special skills in sanitation”: Quoted in Ginn 1997, p. 57.
- 95 a reporter visited: “Filtration Plant on Wheels Is New Feature at Meade.” *Washington Times*, July 3, 1918.
- 96 Sanitary Corps handbook: Mason 1917.
- 96 At Camp Meade: U.S. Army Center of Military History 2017.

- 96 “massed singing as”: U.S. War Department 1919.
- 96 shipped to France: Cable No. 2022, General Headquarters A.E.F., France, 06 October 1918. NAID: 209267030. <https://catalog.archives.gov/id/209267030>.
- 96 the 301st Water Tank Train: “Wells, William Firth.” In *Who’s Who in New York 1929*. New York, NY: L. R. Hamersly; Lee 1920.
- 96 commanded four hundred twenty men: U.S. Army Corps of Engineers 1920.
- 96 a convoy of trucks: Orchard 1919; Pratt 1919.
- 96 340,000 were hospitalized: Byerly 2010.
- 97 young adults: Wever and van Bergen 2014.
- 97 Martha: WW, June 9, 1931. Personal History Record. CF, Series 200, Box 20, Folder 233.
- 97 “some generally-diffused poison”: Peacock 1848, p. 106.
- 97 Richard Pfeiffer: Pinkowski 2022.
- 97 “I consider myself”: Pfeiffer 1892, p. 128.
- 97 “the bacillus influenza of Pfeiffer”: Quoted in “Government Seeks to Check Influenza.” *Providence Journal*, September 14, 1918.
- 97 Charles Chapin: DeCesare n.d.; Navarro and Markel 2016.
- 97 “The air has no part”: Chapin 1914, p. 428.
- 97 “Influenza is chiefly sprayed”: Quoted in “How to Keep from Getting Influenza.” *Providence Sunday Journal*, October 6, 1918.
- 98 “One may fool”: Chapin 1919, p. 785.
- 98 going out in public: French 2020; Markel et al. 2007.
- 98 an inhaled form of plague: “Inside Harbin Plague Hospital Whence No Patient Comes Alive.” *Times-Democrat*, May 14, 1911.
- 98 Wu Lien-teh: Flohr 1996; Lynteris 2018; Wu 1926; Wu 1959.
- 98 “Otherwise, the germs present”: Wu 1959, p. 21.
- 98 Wu was hailed: Great Britain Parliament House of Commons 1911.
- 99 Only after the epidemic: Strong, Petrie, and Stanley 1912.
- 99 “Their use during”: Barber and Teague 1912, p. 268.
- 99 “The mask not only protects”: Weaver 1918, p. 78.
- 99 without any hard data: Nakayama 2020; Tomes 2010.
- 99 “The evidence before”: “A Working Program Against Influenza Prepared by an Editorial Committee of the American Public Health Association.” 1919. *Am J Public Health* 9:1-13.
- 99 “During the compulsory”: Kellogg 1919, p. 12.
- 100 spent the winter: “Society.” *Austin American-Statesman*, October 23, 1918.
- 100 “the failure of public health”: WW, n.d. Author’s Questionnaire. CF, Series 13.9, Box 68, Folder 821.
- 100 returned to saving oysters: W. F. Wells 1920.
- 100 twentieth-century pollution: Nelson 1957.
- 101 a long, spectacular history: Nigro 2011.
- 101 “Oyster culture, the most valuable fishery”: W. F. Wells 1922, p. 42.

- 101 “I was completely stumped”: Quoted in Borland 1922.
- 101 millions of oysters: Pope 1924.
- 101 “I have had to be”: Quoted in “How to Raise a Large Family.” *Suffolk County News*, August 20, 1920.
- 102 “eating with obvious gusto”: “The Sad Story of a Social Downfall.” *St. Louis Post-Dispatch*, February 15, 1925.
- 102 artificially propagated oysters: “‘Synthetic’ Oysters Served to Diners.” *New York Times*, October 2, 1925; Haskin 1926.
- 102 “Artificial oysters!”: “Artificial Oysters.” *Pittsburgh Gazette*, December 25, 1924.
- 102 “The super oyster”: “Super-Oyster Is on Its Way to Dinner Table: Bigger and Better Bivalve Sports Pedigree.” *Hartford Courant*, March 27, 1927.
- 102 filled an auditorium: “The Birth of an Oyster Makes a Good Movie Show.” *Patchogue Advance*, February 25, 1927.
- 102 consulting for the city of New York: Johns Hopkins University Individual Record Card for Faculty Members.
- 103 shellfish biologists: Timmons et al. 2004.
- 103 “Mildred has a widespread reputation”: University of Texas 1915, p. 349.
- 103 beat a newspaper editor: “Raising Cain.” *Austin American-Statesman*, March 11, 1885.
- 104 Weeks was arrested: “An Arrest Made.” *Galveston Daily News*, December 18, 1889.
- 104 “that he believed”: “W. F. Weeks: Former Stewart at the Insane Asylum, Arrested by Sheriff White.” *Austin American-Statesman*, December 19, 1889.
- 104 The case was dismissed: “Wouldn’t Hold Water.” *Austin American-Statesman*, April 2, 1890.
- 104 the care of her parents: “Mrs. Margaret Hester Denton.” *Austin American-Statesman*, March 16, 1921.
- 104 Her obituary: “Death of Mrs. Alice Denton Weeks.” *Austin American-Statesman*, October 6, 1901.
- 104 “housework”: 1925 Census Record, New York. familysearch.com.
- 104 “After the business meeting”: “Town Talk.” *Suffolk County News*, October 26, 1928.
- 105 Bud: ER and RR, n.d. “Biography of the Riley Family.” RRP, Box 4.
- 105 “confined at home”: Quoted in Lester G. Evans, September 13, 1937. 3101 University of Pennsylvania—Study of the Prevention and Control of Air-Borne Infections. CF, Series 18, Box 269, Folder 2566.
- 105 an apartment in Harlem: WW, June 9, 1931. Personal History Record. CF, Series 200, Box 20, Folder 233.
- 105 International Committee for the Study of Infantile Paralysis: Wilson 2015.
- 105 a polio detective: Thorne 1923.
- 105 review all the published research: “Four Years Survey of Infantile Paralysis Throws New Light on This Scourge of Childhood.” *Brooklyn Daily Eagle*, January 29, 1933.
- 105 “The medical profession”: “Studying Child Paralysis.” *New York Times*, August 5, 1899.

- 105 Karl Landsteiner and Erwin Popper: Kristensson 1999.
- 105 “The lack of obvious connection”: Milbank 1932, p. 370.
- 105 “does not behave”: Ibid., p. 444.
- 106 “Absence of infection”: Chapin 1914, p. 428.
- 106 “the various air-borne”: Milbank 1932, p. 447.
- 106 “It is conveyed”: Ibid., p. 442.
- 106 “It is interesting”: “Review of Poliomyelitis.” 1933. *N Engl J Med* 208(11):616-7.
- 106 “No new conclusions”: “Notices of Recent Publications.” 1933. *Brain* 55(4):604-8.
- 107 an instructor in sanitary science: W. F. Wells 1934a.
- 107 twenty-five hundred dollars: WW, June 9, 1931. Personal History Record. CF, Series 200, Box 20, Folder 233.
- 107 A colleague at Harvard: Lester G. Evans, September 13, 1937. 3101 University of Pennsylvania—Study of the Prevention and Control of Air-Borne Infections. CF, Series 18, Box 269, Folder 2566.
- 107 “This slender, middle-aged man”: E. Riley 1980a, p. 81.
- 107 “He has given”: Wilson Smillie to John A. Ferrell, May 28, 1931. CF, Series 200, Box 20, Folder 233.
- 107 Wilson Smillie: “Dr. Wilson G. Smillie, a Leader in Public Health, Is Dead at 84.” *New York Times*, August 6, 1971.
- 107 peculiar: Lester G. Evans, September 7, 1937. Memo to Miss Quinn. CF, Series 18, Box 269, Folder 2566.
- 107 walking in the path: WW to Geddes Smith, March 28, 1941. CF, Series 13.9, Box 68, Folder 813.
- 107 Gordon Fair: “Prof. G. M. Fair of Harvard Dies.” *New York Times*, February 13, 1970.
- 108 metal fume fever: Drinker and Hatch 1936.
- 108 the humidity in hospitals: Blackfan, Yaglou, and Wyman 1933.
- 108 an old pen-and-ink picture: WW to CW, March 22, 1945. CWP.
- 108 an air centrifuge: Drinker and Wells 1934; W. F. Wells 1933.
- 109 alpha streptococci: Grinnell 1928.
- 109 “He won”: EW to RH, May 6, 1947. CF, Series 18, Box 270, Folder 2577.
- 109 Edwin Wilson: “Dr. Edwin B. Wilson, Taught at Harvard.” *New York Times*, December 29, 1964.
- 109 Edward Riley: E. Riley 1980a; ER, June 5, 1994. “More biography.” RRP, Box 4; ER and RR, n.d. “Biography of the Riley Family.” RRP, Box 4.
- 109 a surge of *E. coli*: W. F. Wells 1935.
- 110 The Commonwealth of Massachusetts: Massachusetts Department of Public Health 1935; Wells and Riley 1937.
- 110 make the air humid: Thompson 1924.
- 110 “a wizard whom”: R. Riley 1957, p. 931.
- 111 test poison gas: W. F. Wells 1955.

- 111 some remnants survived: W. F. Wells 1934a.
- 111 credit Richard Riley: W. F. Wells 1955, p. viii.
- 111 “The contrast between”: Ibid., p. vii.
- 111 his first public talk: W. F. Wells 1934b.
- 111 “It appears”: W. F. Wells 1934a.
- 112 a chilly day in late 1934: Neither Wells nor Richard Riley provided the exact date for this demonstration. However, we know that Riley, who assisted Wells and recorded the results, joined him in 1934. The first reference I find to this prank is in a February 19, 1935 letter to Charles-Edward Amory Wilson. Discussing a newly published paper, he says that he continued the work and obtained interesting results, including the surveys of the lecture hall, clinics, and so on. In his own report, Riley writes that the sneezing powder experiment took place when the weather was cold. It is reasonable to conclude that the experiment took place in late 1934. See WW to CW, February 19, 1935. CWP; RR, 1937. “A Comparative Study of *Streptococcus viridans* Isolated from Room Air and From the Normal Nasopharynx.” RRP, Box 1.
- 112 “This is the type”: Esmond R. Long, JS, and SM, August 4, 1937. A Project for Further Study of the Prevention and Control of Air-Borne Infections. CF, Series 200, Box 20, Folder 233.
- 112 “A practical joke”: Wells and Wells 1936, p. 1701.
- 113 “‘Air-borne infection’ might revive”: Ibid., p. 1702.
- 114 As a couple: W. Frank Walker to Barbara S. Quin, September 27, 1937. CF, Series 18, Box 269, Folder 2566.
- 114 Mildred gained a reputation: Lester G. Evans. 1937. 3101 University of Pennsylvania—Study of the Prevention and Control of Air-Borne Infections. CF, Series 18, Box 269, Folder 2566.
- 114 how long bacteria could stay alive: W. F. Wells 1934b; Wells and Stone 1934.
- 114 In New York City: Pincus and Stern 1937.
- 114 thirty-six thousand cubic feet of air: Buchbinder, Solowey, and Solotorovsky 1938.
- 115 “the most prevalent”: Rosenau 1935, p. 1.
- 115 “The hazard is much less”: Ibid., p. 917.
- 115 “If, on the contrary”: Wells and Wells 1936, p. 1703.
- 115 half an hour: Labadie et al. 2020; Wells and Brown 1936.
- 116 “The complacency of those”: WW to RC, February 10, 1958. CF, Series 13.9, Box 68, Folder 818.
- 116 “shatter this comforting doctrine”: Kaempffert 1934a.
- 116 “Germs and Winds”: *New York Times*, December 25, 1934.
- 116 reveal the same living atmosphere: Wells and Fair 1935.
- 117 “The indoor air”: WW to BC, July 20, 1954. CF, Series 13.9, Box 68, Folder 821.
- 117 mercury lamps: Fair 1920; Fair 1963.
- 117 None developed the flu: “Ultra-Violet Rays Free Air of Germs.” *New York Times*, September 20, 1935.

- 117 Charles McKhann: McKhann, Steeger, and Long 1938.
- 117 Infants' Hospital: Del Mundo and McKhann 1941; Reed 2010.
- 117 Joseph Stokes: "Joseph Stokes, 76, Pediatrician, Dies." *New York Times*, March 12, 1972.
- 117 ultraviolet lights in doorways: Wells et al. 1940.
- 117 The Pullman Company: Lester G. Evans, 1937. Interviews with Joseph Stokes, Esmond R. Long, SM, Mr. and Mrs. Wells, and Charles McKhann. CF, Series 18, Box 269, Folder 2566.
- 117 the Bangor and Aroostook line: SM to Barry C. Smith, December 20, 1937. CF, Series 18, Box 269, Folder 2566.
- 118 "Ultra Violet Air Dooms Germs": *Times Union*, September 20, 1935.
- 118 "Scientists Fight Flu Germs With Violet Ray": *Decatur Daily Review*, July 30, 1936. See also "Light on Influenza." *New York Times*, July 23, 1936.
- 118 "In time the lamps": "Bacteriology: Researchers Measure Light's Antiseptic Power." *Newsweek*, September 28, 1935, p. 17.
- 118 "Chief among his aids": "Scientists Turn to Schools in Fight on Infections in Air." *South Bend Tribune*, June 25, 1937.
- 118 "In his fast scientific stride": "Medicine: Light on Disease." *Time*, August 3, 1936.
- 118 an enormous gathering: Harvard School of Public Health 1937.
- 118 "the intellectual center": "World Scholars to Honor Harvard." *New York Times*, August 30, 1936.
- 118 publish the speech: Wells and Wells 1936.
- 119 "The growth of these ideas": WW to CW, September 30, 1936. CWP.
- 119 seems to have started: Lester G. Evans, 1937. Interviews with Joseph Stokes, Esmond R. Long, SM, Mr. and Mrs. Wells, and Charles McKhann. CF, Series 18, Box 269, Folder 2566.
- 120 share a patent: Fair and Wells 1937.
- 120 none of their colleagues: SM to Barry C. Smith, August 4, 1937. Memorandum: Telephone conversation with Dr. Alfred N. Richards, June 29, 1937. CF, Series 200, Box 20, Folder 233.
- 120 "has his feet": Wade H. Frost to Barbara S. Quin, September 11, 1937. CF, Series 18, Box 269, Folder 2566.
- 120 Mildred carried out: W. Frank Walker to Barbara S. Quin, September 27, 1937. CF, Series 18, Box 269, Folder 2566.
- 120 "I had an extraordinary amount": JS to Cretyl Mills, December 14, 1964. APS/JS.
- 121 Henry Phipps Institute: McBride 1987.
- 121 the three men agreed: Memorandum: Telephone conversation with Dr. Alfred N. Richards. June 15, 1937. CF, Series 200, Box 20, Folder 233.
- 121 "have all had": SM to Barry C. Smith, August 4, 1937. CF, Series 200, Box 20, Folder 233.
- 121 "there is a brilliant": RH, August 16, 1941. Visit to project. CF, Series 18, Box 269, Folder 2573.
- 121 "So far as": MW to SM, September 10, 1937. CF, Series 18, Box 269, Folder 2566.
- 122 September 22, 1937: SM to Barbara S. Quin, September 22, 1937. CF, Series 18, Box 269, Folder 2566.

122 entirely convinced of their theory: RH, August 14-16, 1941. Visit to project. CF, Series 18, Box 269, Folder 2571.

122 "I am afraid": MW to CW, May 19, 1938. CWP.

122 a new kind of chamber: W. F. Wells 1940.

122 the Infection Machine: "A Robot That Sneezes Microbes." *Tennessean*, March 10, 1940; Shaltz 1941.

123 introducing the Wellses: RH, May 18, 1945. Summary memorandum. CF, Series 18, Box 270, Folder 2581.

123 Germantown Friends School: <https://www.germantownfriends.org/about-us/history-timeline>.

123 "Pupils come to this school": Wilder 1935, p. 199.

123 The Wellses expected: RH, May 19, 1943. Summary memorandum. CF, Series 18, Box 270, Folder 2575.

123 "Black Light Kills 'Flying' Germs": Spencer 1938.

Chapter 6: The Scattered Workers

125 "The *Hawaii Clipper*": "'Mercy' Flight for PAA Plane." *Honolulu Star-Bulletin*, July 23, 1938.

125 "Fred had left Washington": Haskell and Barss 1939, p. 293.

126 "ARRIVED HONOLULU 7MORNING": Memorandum Regarding Mr. Fred C. Meier. U.S. Department of Agriculture, September 10, 1938. NAL Special Collections, USDA Historical Collection.

126 thirteen hundred miles west: Geoghegan 2017.

126 "Stand by for one minute": Quoted in Civil Aeronautics Authority 1938.

126 dispatched a fleet: Wilkins 1938.

127 The crisis: Coverage of Meier's disappearance included "Lost Clipper Third Major South Sea Aerial Mishap," *San Francisco Examiner*, July 30, 1938; "Two Scientists Sought More Data on Flight." *Baltimore Sun*, July 30, 1938.

127 "The present problem": "Distinguished Men on Board Clipper." *New York Times*, July 30, 1938.

127 "Strangely enough, Dr. Meier": "Cling to Hope: D.C. Men Alive." *Evening Star*, July 30, 1938.

127 "The loss to our Committee": Coker to Committee on Aerobiology. August 8, 1938. NAS, Death of Chairman 1938.

128 "Fantastic tales are being passed": Mallon 1938.

128 "He has of course": Albert L. Barrows to Esmond R. Long, September 13, 1938. NAS, Chairman Death 1938.

128 Karl Compton: Albert L. Barrows to Karl T. Compton, October 3, 1938. NAS, Chairman Death 1938.

128 "I think probably": National Research Council Division of Biology and Agriculture Committee on Aerobiology. Minutes of meeting, October 1, 1938. NAS, Meetings: 1937-1938.

- 129 “Pending the discovery”: Civil Aeronautics Authority 1938.
- 129 “If it had to be”: Smith 1938, p. 233.
- 129 the martyr of aerobiology: Gregory 1961.
- 130 “if anything of value”: E. C. Auchter to R. E. Coker, October 5, 1938. USDA/BPI, RG 54, Entry PI-66 167, General Correspondence of the Chief, 1908-39, Box 822, File 31754.
- 130 “We are existing”: National Research Council Division of Biology and Agriculture Committee on Aerobiology 1938.
- 130 organizing a symposium: Moulton 1941.
- 130 *Aerobiology*: Moulton 1942.
- 130 R. C. McLean: McLean 1915; McLean 1935.
- 131 “not quite the book”: McLean 1943, p. 258.

Chapter 7: War at Home

- 135 many in his audiences were unimpressed: RH, August 16, 1940. Visit to project. CF, Series 18, Box 269, Folder 2571.
- 135 “Misunderstanding, or even misrepresentation”: WW and MW, August 1940. Annual Report, August 1, 1939-July 31, 1940. CF, Series 18, Box 271, Folder 2584.
- 136 Friedrich Weyrauch: Klee 2001; Klimpel 2005.
- 136 mysteriously immune: Schütz 2020.
- 136 This racist myth: Weindling 2000.
- 136 Hygiene Institute: Weindling 2015.
- 136 Weyrauch’s close friend: Mrugowsky was Weyrauch’s daughter’s godfather. Klimpel 2005.
- 136 Buchenwald: Steinbacher 2010.
- 137 “It is often forgotten”: Weyrauch and Rzymkowski 1938.
- 137 “A large part”: “Nobel Prize Laureates.” <https://www.zeiss.com/microscopy/en/about-us/nobel-prizes.html>.
- 137 Johannes Rzymkowski: DigiPortA. <http://www.digiporta.net/index.php?id=994933857>.
- 137 “In general, the droplets sink”: Weyrauch and Rzymkowski 1938.
- 138 “We immediately recognized”: W. F. Wells 1955, p. 4.
- 138 Mildred promptly wrote: WW to BC, January 28, 1953. CF, Series 13.9, Box 68, Folder 815.
- 138 “Infection of Air”: Wells, Wells, and Mudd 1939.
- 138 “With our disclosure”: WW to BC, June 24, 1953. CF, Series 13.9, Box 68, Folder 816.
- 139 old scientific questions: Jennison 1934; Jennison 1935.
- 139 Harold Edgerton: Edgerton and Killian 1979.
- 139 a steamer clam: Jennison and Bunker 1934.
- 139 saw another opportunity: Marshall Jennison, June 14, 1940. Infection of Air by Sneezing. CF, Series 13.9, Box 68, Folder 819.
- 139 The images: Jennison 1941; Jennison and Edgerton 1940; Turner, Jennison, and Edgerton 1941.

- 140 "The muzzle velocity": Marshall Jennison, June 14, 1940. Infection of Air by Sneezing. CF, Series 13.9, Box 68, Folder 819.
- 140 "proof of air-borne": Moulton 1942, p. 125.
- 140 "This Is Nothing to Sneeze At": *Plain Speaker*, April 19, 1940.
- 141 "Here for the first time": RH, May 4-5, 1939. Visit of Mr. Geddes Smith and Dr. Heffron to Dr. Mudd and the Wells. CF, Series 18, Box 269, Folder 2569.
- 141 a shy, mouselike man: RH, September 15, 1938. Meeting with Drs. Mudd, Long, and Stokes. CF, Series 18, Box 269, Folder 2568.
- 141 the natural way: Shaltz 1941.
- 141 took longer to die: University of Pennsylvania 1939; Lurie 1964; Wells and Lurie 1941.
- 141 "Now we have": Quoted in Shaltz 1941.
- 141 Werner Henle: Wells and Henle 1941.
- 142 delighted with the results: RH, August 23, 1939. Interview with Dr. Esmond R. Long. CF, Series 18, Box 269, Folder 2569.
- 142 "The Wells themselves": RH, August 14-16, 1941. Visit to project. CF, Series 18, Box 269, Folder 2571.
- 142 maddened other scientists: Alfred N. Richards to RH, July 31, 1940. CF, Series 18, Box 269, Folder 2571.
- 142 "Among Mr. Wells' gifts": SM to RH, August 23, 1939. CF, Series 18, Box 269, Folder 2569.
- 142 "Wells is a queer dick": Alfred N. Richards to Barbara S. Quin, May 25, 1940. CF, Series 18, Box 269, Folder 2571.
- 142 got into fights: SM to Barbara S. Quin, September 26, 1939. CF, Series 18, Box 269, Folder 2570.
- 142 rein in their spending: Barbara S. Quin to Alfred N. Richards, June 14-15, 1942. CF, Series 18, Box 270, Folder 2581.
- 142 "I cannot overlook": WW to SM, January 17, 1940. CF, Series 18, Box 270, Folder 2580.
- 142 "Creative workers in any field": SM, August 3, 1938. Report of the Laboratories for the Study of Air-Borne Infection, 1937-1938. CF, Series 18, Box 269, Folder 2567.
- 142 director: SM to WW, September 26, 1939. CF, Series 18, Box 269, Folder 2570.
- 142 accused their patrons: Alfred N. Richards to Barbara S. Quin, May 25, 1940. CF, Series 18, Box 269, Folder 2571.
- 143 Mildred scanned: RH, August 15-17, 1939. Visit to Philadelphia. CF, Series 18, Box 269, Folder 2569.
- 143 Swarthmore: "Try New Project at Swarthmore." *Delaware County Daily Times*, July 20, 1940.
- 143 "Probably no contagious disease": Wells, Wells, and Wilder 1942, p. 105.
- 143 "No more severe test": WW to RH, April 12, 1940. CF, Series 18, Box 269, Folder 2571.
- 144 about ten thousand died: Rosenau 1935.
- 144 bacteria or viruses: Enders 1940.

- 144 “Many parents have gotten”: Dafoe 1941.
- 144 the biggest wave: M. W. Wells 1942.
- 144 added up the cases: WW and MW, August 5, 1941. Fourth Annual Report, October 1, 1940-July 31, 1941. CF, Series 18, Box 269, Folder 2573.
- 144 the difference was even starker: W. F. Wells 1943.
- 145 Newspapers celebrated the results: Neff 1942.
- 145 “perfectly extraordinary”: RH, August 16, 1941. Visit to project. CF, Series 18, Box 269, Folder 2573.
- 145 “proved as conclusively”: EW to Alfred N. Richards, August 19, 1941. CF, Series 18, Box 269, Folder 2573.
- 145 “I have been”: WW to CW, October 28, 1941. CWP.
- 145 a cluster of papers: W. F. Wells 1942; W. F. Wells 1943; Wells, Wells, and Wilder 1942.
- 145 “This was more”: R. Riley 1980a.
- 145 Ronald Hare: Hare 1940.
- 146 “There is reason”: Ibid., p. 540.
- 146 “reign of terror”: Quoted in Glass 2018.
- 146 “an honor which”: CL to Herman Goering, October 25, 1938. CAL, Box 37, Folder: 1938 Oct 8-31.
- 146 “I feel that”: CL to General Erhard Milch, February 14, 1939. CAL, Box 37, Folder: 1939 Feb 11-28.
- 147 “A general European war”: CL to Joseph P. Kennedy, September 22, 1938. CAL, Box 37, Folder: 1938 Sep.
- 147 “It is time”: Lindbergh 1939, p. 67.
- 147 Roosevelt lashed out: “Copperhead Label: Lindbergh Speech Stirs FDR and Flier Resigns Commission.” *Newsweek*, May 5, 1941.
- 147 expanding the US Army: Huston 1968.
- 147 “Casualties from respiratory disease”: WW and MW, August 1940. Annual Report, August 1, 1939-July 31, 1940. CF, Series 18, Box 271, Folder 2584.
- 147 “This, of course”: SM to Barbara S. Quin, July 30, 1940. CF, Series 18, Box 269, Folder 2571.
- 147 infectious disease experts: Woodward 1990.
- 148 “Dr. Wells feels”: Science Service 1940.
- 148 some powerful allies: “Pennsylvania Men Hold Key Medical Posts in Defense Program.” *Pennsylvania Gazette* 40(3):80-1.
- 148 Arthur Hitchens: Hitchens 1941; Stafford 1941.
- 148 Speaking at the annual meeting: Hitchens 1940.
- 148 “We may expect”: “Present War May Bring Conquest of Influenza.” *York Daily Record*, October 27, 1939.
- 148 “The larger the experiment”: WW, August 14, 1941. Memorandum on Environmental Control of Epidemic Disease in the Army. CF, Series 18, Box 269, Folder 2573.

- 148 “It might be that”: WW and MW, August 5, 1941. Fourth Annual Report, October 1, 1940-July 31, 1941. CF, Series 18, Box 269, Folder 2573.
- 148 Oswald Robertson: “Dr. O. H. Robertson, Medical Pioneer.” *New York Times*, March 25, 1966; Robertson 1943.
- 148 ethylene glycol: Robertson et al. 1941a; Robertson et al. 1941b.
- 148 was left seething: WW to RH, September 24, 1942. CF, Series 18, Box 270, Folder 2574; WW to RH, October 1, 1942. CF, Series 18, Box 270, Folder 2574.
- 149 not a penny: WW to RH, June 10, 1942. CF, Series 18, Box 270, Folder 2574.
- 149 “We wasted much time”: WW and MW, April 22, 1943. Progress Report, October 1, 1940-April 15, 1943. CF, Series 18, Box 270, Folder 2575.
- 149 Hugely disappointed: RH, July 13-15, 1942. Visit to project. CF, Series 18, Box 270, Folder 2574.
- 149 “An epidemic of respiratory contagion”: WW to RH, June 10, 1942. CF, Series 18, Box 270, Folder 2574.
- 149 a short manual: RH, August 15-17, 1939. Visit to Philadelphia. CF, Series 18, Box 269, Folder 2569.
- 149 stick to their research: RH, August 16, 1940. Visit to project. CF, Series 18, Box 269, Folder 2571.
- 149 look over crude drafts: RH, August 14-16, 1941. Memorandum. CF, Series 13.9, Box 68, Folder 813.
- 149 “Frankly I’m afraid”: Geddes Smith to Barry C. Smith, October 1, 1942. CF, Series 13.9, Box 68, Folder 813.
- 149 an explosive outbreak of mumps: WW to RH, September 24, 1942. CF, Series 18, Box 270, Folder 2574.
- 150 three times deadlier: RH, May 19, 1943. Summary memorandum. CF, Series 18, Box 270, Folder 2575.
- 150 seasonal ebbs and flows: M. W. Wells 1944.
- 150 “My own feeling”: MW to EW, September 2, 1943. EWP.
- 150 “I am, of course”: MW to EW, August 16, 1943. EWP.
- 151 Lurie refused: RH, April 14, 1942. Telephone conversation with Dr. Long. CF, Series 18, Box 270, Folder 2574.
- 151 started to wonder: RH, March 15, 1943. Interview with Dr. Alfred N. Richards. CF, Series 18, Box 270, Folder 2575.
- 151 a new principal: RH, May 18, 1945. Summary memorandum. CF, Series 18, Box 270, Folder 2581.
- 151 had been skeptical: RH, August 16, 1941. Visit to project. CF, Series 18, Box 269, Folder 2573.
- 151 as a luxury: RH to Barry C. Smith, March 24, 1943. Memorandum. CF, Series 18, Box 270, Folder 2575.
- 151 “It may take”: EW to RH, May 13, 1943. CF, Series 18, Box 270, Folder 2575.

- 151 They started to argue: RH, March 15, 1943. Interview with Dr. Alfred N. Richards. CF, Series 18, Box 270, Folder 2575.
- 152 A glowing *Saturday Evening Post* feature: Spencer 1946.
- 152 “domestic crisis”: RH, May 18, 1945. Summary memorandum. CF, Series 18, Box 270, Folder 2581.
- 152 create a bigger shield: MW to EW, November 3, 1943. EWP.
- 152 “Rightly or wrongly”: MW to EW, October 6, 1944. EWP.
- 152 “The studies have”: Ibid.
- 153 “in order to”: RH, July 12, 1944. Memorandum of visit. CF, Series 18, Box 270, Folder 2576.
- 153 “We have a better set”: EW to RH, May 12, 1944. CF, Series 18, Box 270, Folder 2576.
- 153 measles and chicken pox: M. W. Wells 1944.
- 153 “I think it is one”: CW to MW, January 26, 1945. CWP.
- 153 “Will and I”: MW to EW, October 6, 1944. EWP.
- 153 the final analysis: M. W. Wells 1945.
- 154 ended up the hero: Kaempffert 1944.
- 154 “The question is more than”: MW to Theodore Wilder, October 11, 1944. 3558 University of Pennsylvania. CF, Series 18, Box 270, Folder 2576.
- 155 “Many of the points”: WW to Geddes Smith, October 9, 1944. 3558 University of Pennsylvania. CF, Series 18, Box 270, Folder 2576.
- 155 how they sprayed barracks: Bigg, Jennings, and Olson 1945.
- 155 11 percent: Wheeler et al. 1945.
- 155 Alexander Hollaender: Rader 2006.
- 155 “The mingling of sailors”: WW, August 18, 1944. Report of Laboratories for the Study of Air-Borne Infection, 1943-1944. CF, Series 18, Box 271, Folder 2587.
- 156 “Germ-killing ultraviolet light”: Science Service 1944.
- 156 “In view of the fact”: Wheeler et al. 1945, p. 468.
- 156 In a 1944 study: Robertson, Hamburger, and Loosli 1944.
- 156 applying mineral oil: RH, May 18, 1945. Summary memorandum. CF, Series 18, Box 270, Folder 2581; Wolman et al. 1947.
- 156 “Such a cloud”: WW, April 2, 1947. A Report of the Laboratories for the Study of Air-Borne Infection, April 15, 1945-April 7, 1947. CF, Series 18, Box 270, Folder 2577.
- 156 “Oiling of floors”: U.S. Army Medical Department 1955, p. 72.
- 157 “I envy your great opportunity”: WW to OR, December 19, 1944. APS/OR.
- 157 influenza vaccine: Hoyt 2006.
- 157 James Perkins: Perkins, Bahlke, and Silverman 1947.
- 157 a visionary: James Perkins to Geddes Smith, June 8, 1951. CF, Series 13.9, Box 68, Folder 814.
- 157 “Only the Wells”: James Perkins to William Holla, March 12, 1946. CF, Series 18, Box 270, Folder 2576.

- 158 “I think it would go”: WW to CW, April 10, 1945. CWP.
- 158 students were easy prey: RR, n.d. “UV Irradiation of Infected Air: Review of Experience in the United States (lecture manuscript).” RRP, Box 1.
- 158 “It is not to be construed”: Perkins, Bahlke, and Silverman 1947.
- 158 “The striking success”: “The Control of Air-Borne Infection.” *Br Med J* 2(4482):820-1. doi:10.1136/bmj.2.4482.820.
- 159 “Unless extremely violent”: Hare and Mackenzie 1946, p. 867.
- 159 “ravages of misinterpretation”: WW to RH, October 25, 1945. CF, Series 18, Box 270, Folder 2576.
- 159 a new committee: Langmuir et al. 1950; Perkins 1945.
- 159 Oswald Robertson: RH, May 9, 1947. Interview with Drs. Kenneth Maxie and Oswald H. Robertson. CF, Series 18, Box 270, Folder 2577.
- 159 Alexander Langmuir: RH, May 2, 1947. Interview with Dr. Alexander Langmuir. CF, Series 18, Box 270, Folder 2577.
- 159 “He has now fallen”: RH, June 12, 1947. 3765 University of Pennsylvania—Study of the Prevention and Control of Air-borne Infections. CF, Series 18, Box 270, Folder 2577.
- 159 “I don’t understand”: EW to RH, May 11, 1945. CF, Series 18, Box 270, Folder 2581.
- 159 “The split-up between”: RH, May 9, 1947. Interview with Drs. Kenneth Maxie and Oswald H. Robertson. CF, Series 18, Box 270, Folder 2577.
- 160 some of his most important research: W. F. Wells 1948; W. F. Wells et al. 1948.
- 160 Herbert Ratcliffe: Ratcliffe 1946.
- 160 create them in two sizes: RH, May 18, 1945. Summary memorandum. CF, Series 18, Box 270, Folder 2581.
- 160 “Most dust-born bacteria”: WW et al., August 1, 1946. Progress Report, April 1, 1945-August 1, 1946. CF, Series 18, Box 271, Folder 2588.
- 161 the Veterans Administration: WW, April 2, 1947. A Report of the Laboratories for the Study of Air-borne Infection, April 15, 1945-April 7, 1947. CF, Series 18, Box 270, Folder 2577.
- 161 install ultraviolet lamps: RH, May 1, 1947. 3677 University of Pennsylvania—Study of Air-Borne Infections. CF, Series 18, Box 270, Folder 2577.
- 161 giving up on his entire theory: Eickhoff 1996.
- 161 “The relative importance”: Alexander Langmuir to WW, May 28, 1949. CWP.
- 161 “Thus, the challenge”: Langmuir 1961, p. 175.
- 161 Heffron consulted with Langmuir: RH, May 2, 1947. 3677 University of Pennsylvania—Study of Air-Borne Infections. Interview with Dr. Alexander Langmuir. CF, Series 18, Box 270, Folder 2577.
- 162 Wilson Smillie: RH, May 12, 1947. 3677 University of Pennsylvania—Study of Air-Borne Infections. Interview with Dr. Wilson G. Smillie by Dr. Heffron. CF, Series 18, Box 270, Folder 2577.
- 162 delivered his verdict: RH, June 12, 1947. 3765 University of Pennsylvania—Study of the Prevention and Control of Air-Borne Infections. CF, Series 18, Box 270, Folder 2577.

162 “I cannot say”: WW to RH, June 17, 1947. CF, Series 18, Box 270, Folder 2577.

Chapter 8: Wings for Death

163 “is almost literally”: Stakman 1942, p. 1.

163 biological warfare: Carus 2017; Poupard and Miller 1992.

163 “They ordered corpses”: Quoted in Wheelis 2002, p. 973.

164 the centuries that followed: Carus 2015; Carus 2020.

164 unleash cholera in London: Quail 1978.

164 “All those people”: H. G. Wells 1895, p. 11-2.

164 “Distribution from airships”: Sims-Dawson 1915.

165 “The extraordinarily high proportion”: “Germ-Laden Air-Bombs.” *Aeronautics*, December 21, 1915.

165 send spies: Ewin 2020; Pfeiffer 2017.

165 more than a million horses: U.S. Foundation for the Commemoration of the World Wars.

<https://www.worldwar1centennial.org/brookeusa-home-page.html>.

165 “Great masses of men”: Quoted in League of Nations 1925, p. 340.

165 “bacteriological methods of warfare”: United Nations Office for Disarmament Affairs.

<https://www.un.org/disarmament/wmd/bio/1925-geneva-protocol>.

165 a catastrophic biological assault: Cochrane 1947; Guillemin 2006.

165 Reports surfaced: “Those German Microbes.” *New York Times*, June 29, 1934; Hugh-Jones 1992.

166 “Indeed, to fail”: ES, February 17, 1942. “Plant Pathology in War.” Exhibit F. Report of W.B.C. Committee. National Academy of Sciences Archives. Committees on Biological Warfare, Series 1, Box 2.

167 “A SHOT/GUN ATTACK”: Ibid.

167 “distinctly feasible”: E. B. Fred. Report of the W.B.C. Committee, July 18, 1942. National Academy of Sciences Archives. Committees on Biological Warfare, Series 1, Box 2.

168 “Biological warfare is”: Quoted in Whitby 2002, p. 72.

168 Camp Detrick: Regis 1999.

168 “The world was like”: Quoted in Harrison 1968.

168 “Mr. Biological Warfare”: Shepard 1959.

168 his father: A. Rosebury 1973; TR to John Williamson, July 28, 1971. TRP, Box 1, Folder 31; TR, n.d. “Five Morbid Pieces.” TRP, Box 11, Folder 5.

169 a Philadelphia lunchroom: TR, 1975. “A Random Reminiscence.” TRP, Box 1, Folder 1.

169 Lily Aaronson: “Noted Author Succumbs; Made Home in Conway.” *Recorder*, December 29, 1976.

169 biology of teeth: TR, 1972. Experiences at the Columbia Medical Center in Its Early Years. SDOS lecture. TRP, Box 7, Folder 6; TR, n.d. “Autobiographical Sketch of Theodor Rosebury, Author of ‘Peace of Pestilence.’” TRP, Box 1, Folder 1.

169 In his school notebook: TR, 1926-1928. TRP, Box 1, Folder 10.

- 169 fellowship at Columbia: Miller 1930.
- 169 “looked to my dental classmates”: TR. “Autobiographical Sketch.”
- 170 the origin of cavities: McHugh 1936; Rosebury and Karshan 1931.
- 170 more prone to cavities: “Caries Not Due to Diet Alone.” *Kansas City Star*, March 18, 1936.
- 170 “with a fallen log”: TR, 1972. “Experiences at the Columbia Medical Center in Its Early Years.” SDOS lecture. TRP, Box 7, Folder 6.
- 170 The diet of the Eskimos: Rosebury and Waugh 1939.
- 170 “White man’s food”: “Footnotes.” *Lincoln Nebraska State Journal*, December 12, 1938.
- 170 “I began to read”: TR, 1972. “Experiences at the Columbia Medical Center.” SDOS lecture. TRP, Box 7, Folder 6.
- 170 American Association of Scientific Workers: “Scientists Start Social Work Body.” *New York Times*, December 31, 1938; Kuznick 1987.
- 170 launched a boycott: “College Scientists Boycott Nazi Products, Boston and Cambridge Group Taking Lead.” *New York Times*, March 26, 1939.
- 171 resumed his research: Rosebury 1940.
- 171 “normal flora”: TR. “Normal Flora: A Tentative Outline.” TRP, Box 6, Folder 15, 1958.
- 171 “neither recognize nor stop”: Quoted in “Influenza Sure to Follow War.” *Union County Journal*, January 8, 1940.
- 171 “At most, this was”: Rosebury 1949, p. 5.
- 171 “I shall never forget”: TR, 1951. “Fear, War, and Science.” TRP, Box 9, Folder 2.
- 171 defeat Hitler: Rosebury 1942.
- 172 “The air-borne route”: Rosebury and Kabat 1947.
- 172 “By the air-borne route”: Rosebury 1949, p. 121.
- 173 A doctor in Annapolis, Maryland: Honigsbaum 2019.
- 173 Lying on the bottom: Zimmer 2019.
- 174 woolsorter’s disease: Eurich 1913; Metcalfe 2004; Wyatt 1978.
- 174 “Scarcely a month passes”: Bell 1880, p. 872.
- 174 “The fluids from this animal”: Bell 1902, p. 635.
- 174 “Its properties make it”: Rosebury and Kabat 1947.
- 174 the secret analysis: E. B. Fred, September 11, 1942. Memorandum: Subject: Conference with Prof. A. R. Dochez. National Academy of Sciences, Archives collection “Committees on Biological Warfare, 1941-1948,” Series 6: Name Files: Fred E B: Memoranda: Sept 1942.
- 175 “The immense amount”: E. H. Cushing to TR, June 11, 1942. TRP, Box 1, Folder 20.
- 175 “I have no doubt”: TR, May 12, 1942. Note to be attached to Form 38746 (C.S.C.). TRP, Box 1, Folder 21.
- 175 A colonel in the army’s Dental Corps: R. C. Craven to TR, September 21, 1942. TRP, Box 1, Folder 21.
- 175 “This is so ridiculous”: TR to “George,” January 29, 1943. TRP, Box 1, Folder 21.
- 175 A few months later: Annie L. Williams to TR, August 9, 1943. TRP, Box 1, Folder 21; TR, “Autobiographical Sketch.”

- 175 “It was a cause”: TR, “Five Morbid Pieces.”
- 176 gained some notoriety: Butler 1994.
- 176 they were startled: E. B. Fred, 1942. Memorandum.
- 176 handed a copy: Kabat 1983.
- 176 the best kind of biological weapon: Reed, Nalca, and Roy 2018.
- 176 “These germs may have constituted”: Rosebury 1949, p. 115.
- 176 Airborne Infection Project: TR, n.d. Theodor Rosebury Biographical Data. TRP, Box 1, Folder 1.
- 177 anthrax: Hugh-Jones and Blackburn 2009.
- 177 Camp Detrick’s officers’ club: Rosebury, Ellingson, and Meiklejohn 1947. TR recounts his illness in “Five Morbid Pieces.”
- 179 Gordon Meiklejohn: Eickhoff 1997.

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- 181 British officials: Bernstein 1987, p. 119; Bernstein 1988, p. 298-9.
- 181 working on biological weapons: Beedham and Davies 2020.
- 181 “for use if this mode”: Quoted in Willis 2002.
- 181 Harry Truman: Bernstein 1987.
- 182 Interrogations of Nazi scientists: Weindling 2000.
- 182 Friedrich Weyrauch: Duckwitz and Groß 2021.
- 182 Mrugowsky: Office of Chief of Counsel for War Crimes 1946a; Office of Chief of Counsel for War Crimes 1946b.
- 182 Hitler ordered: Bernstein 1988, p. 299-300.
- 182 wildly underestimated Japan: Barenblatt 2004; Harris 1992; Nie et al. 2010; Port 2014.
- 183 keep the Japanese officers talking: Harris 1995.
- 183 Americans had no plans to stop: Guillemin 2005; Wright 1990.
- 183 Theodor Rosebury officially resigned: Leo J. Hardin, October 1, 1945. Memo. TRP, Box 1, Folder 21.
- 183 sponsoring civilian science: TR, 1972. “Experiences at the Columbia Medical Center.”
- 183 officially came to light: Shalett 1946a; Shalett 1946b.
- 183 “significant contributions”: Merck 1946.
- 184 “I hope that”: TR to Willard C. Rappleye, October 3, 1945. TRP, Box 1, Folder 21.
- 184 Camp Detrick’s technical director: TR. Untitled document, 1970-1973. TRP, Box 6, Folder 7.
- 184 “throw light on the general problem”: Rosebury et al. 1947.
- 184 “It still smacks” Oram C. Woolpert to TR, June 11, 1946. TRP, Box 1, Folder 21.
- 184 “I think they have”: TR to Oram C. Woolpert, June 15, 1946. TRP, Box 1, Folder 21.
- 184 *Experimental Air-borne Infection*: Rosebury 1947.
- 185 Decoration for Exceptional Civilian Service: August 8, 1952. Data on Theodor Rosebury pertaining to draft status for Dr. Brandhorst. TRP, Box 1, Folder 1.

- 185 “We were in a crisis”: Rosebury 1963, p. 514.
- 185 “to bring the subject”: TR to Waldermar Kaempffert, May 19, 1947. TRP, Box 3, Folder 14.
- 185 “Frankly, I believe”: Oram C. Woolpert to TR, March 30, 1946. TRP, Box 1, Folder 20.
- 186 “Publication of this paper”: Willard Rappleye to TR, April 12, 1946. TRP, Box 1, Folder 20.
- 186 submitted their paper: Rosebury and Kabat 1947.
- 186 a press conference: “Scientists See U.S. Very Vulnerable to Germ Warfare.” *New York Times*, May 19, 1947.
- 186 “It is now presented”: Kaempffert 1947.
- 186 The nightmare scenarios: “Bacterial Warfare.” *New York Times*, May 20, 1947.
- 186 “Set down with”: “Medicine: Death in Convenient Bottles.” *Time*, May 26, 1947.
- 186 meted out swift reprisals: Kabat 1983.
- 186 Kabat was a Communist sympathizer: Columbia University Department of Microbiology and Immunology n.d.
- 187 “It was clear”: TR. “Five Morbid Pieces.”
- 187 irrevocable damage: TR to “Isaac and Esther,” January 15, 1950. TRP, Box 1, Folder 1.
- 187 “I had returned”: TR. “Five Morbid Pieces.”
- 187 “Leaving my lab”: TR to Elvin Kabat, July 19, 1949. TRP, Box 3, Folder 14.
- 187 “The integrity of science”: Rosebury and Phillips 1949, p. 123.
- 187 “We need not doubt”: Rosebury 1949, p. 116.
- 188 “It seems to me”: *Ibid.*, p. 167.
- 188 “atomic Pearl Harbor”: Quoted in McEnaney 2020, p. 41.
- 188 “There are indications”: U.S. Department of Defense 1950, p. 15.
- 188 released a pamphlet: U.S. Federal Civil Defense Administration 1951.
- 188 “The big danger”: *Ibid.*, p. 8.
- 189 Alexander Langmuir: Etheridge 1992; Schultz and Schaffner 2015.
- 189 secretly visiting Camp Detrick: Vogel 2021.
- 189 “Specially designed bombs”: Langmuir 1951, p. 396.
- 189 “Epidemiology means getting out”: Quoted in Fairchild, Bayer, and Colgrove 2007, p. 17.
- 189 “When we see”: Quoted in Etheridge 1992, p. 127.
- 189 from biological attacks: Langmuir and Andrews 1952.
- 190 a fifth of his time: Altman 1977.
- 190 North Korea accused: Moon 1992.
- 190 germ warfare attacks: Fairchild, Bayer, and Colgrove 2007.
- 190 Epidemic Intelligence Service: Fearnley 2010.
- 190 the new medium of television: Fee and Brown 2001.
- 190 “What You Should Know About Biological Warfare”: Ray Film Industries 1952.
<https://digital.library.jhu.edu/islandora/what-you-should-know-about-biological-warfare>
- 191 more than two hundred calls: Etheridge 1992.
- 192 “The ranks of American scientists”: McCarthy 1950, p. A7255.
- 192 The government took note: U.S. Subcommittee to Investigate the Administration of the Internal Security Act 1965.

- 192 the United Nations hired Rosebury: "11 in U.N. Accused of Communist Ties." *New York Times*, January 2, 1953.
- 192 "It may be well": TR, 1951. "Fear, War, and Science." TRP, Box 9, Folder 2.
- 193 "I came to feel": TR. "Five Morbid Pieces."
- 193 the three biggest mistakes: TR, 1970-1973. No title. TRP, Box 6, Folder 7.
- 193 "If we could tolerate": TR. "Five Morbid Pieces."
- 193 "believed to be Communists": "Red Quiz Names 38 U.S. Employees in U.N." *Los Angeles Times*, January 2, 1953.
- 193 "Some of my colleagues": TR. "Five Morbid Pieces."
- 194 "It is ironic": Ibid.
- 194 expanding the research: Shane 2004; Sidell, Takafuji, and Franz 1997; Wheelis, Rózsa, and Dando 2006.
- 194 Eight Ball: Reed, Nalca, and Roy 2018.
- 194 "looks like a spaceship": Kortepeter 2020, p. 144.
- 194 "We were pioneers": Quoted in Mabeus 2013.
- 195 Edward Nevin: Altman 1977; Cole 1988; Tansey 2004.
- 195 published a report: Wheat, Zuckerman, and Rantz 1951.
- 195 sparked a panic: The army's concerns came to light in 1977. See U.S. Subcommittee on Health and Scientific Research 1977.
- 196 three died: Kortepeter 2020.
- 197 crop-killing spores: Baker 2020; Whitby 2002.
- 197 stockpiled enough rust: Rogers, Whitby, and Dando 1999.
- 197 "Spare me your sermon": TR. "Five Morbid Pieces."
- 197 turned back to the mystery: "\$54,320 Grant to W.U. Professor." *St. Louis Globe-Democrat*, December 9, 1959.
- 198 the Pugwash Conferences: Robinson 1998.
- 198 "I was back": TR. "Five Morbid Pieces."
- 198 "Science has brought forth": Rosebury 1960.
- 198 "to dispel the miasma": Chisholm et al. 1959, p. 1020.
- 199 first book ever: Rosebury 1962, p. ix.
- 199 Jack Ostergren: Ostergren 1964.
- 199 plant-killing herbicides: "U.S. Jets to Get Plant-Killer Spray." *Detroit Free Press*, March 28, 1965.
- 199 J. Edgar Hoover: Gage 2022.
- 200 Herbert Aptheker: "Red Leader Speaks Here to Dubois Unit." *St. Louis Post-Dispatch*, February 15, 1965.
- 200 "Although I had never": TR. "Five Morbid Pieces."
- 200 tipped off reporters: Matthews and Adams 1977.
- 200 some twelve hundred pages: <https://www.muckrock.com/foi/united-states-of-america-10/theodor-rosebury-report-138467>.

- 200 “The control of the anti-Vietnam movement”: U.S. Subcommittee to Investigate the Administration of the Internal Security Act 1965.
- 201 “If Rosebury is not”: “Disgrace to St. Louis.” *St. Louis Globe-Democrat*, October 17, 1965.
- 201 leave of absence: “Rosebury Granted Leave of Absence.” *St. Louis Post-Dispatch*, April 14, 1966.
- 201 “the intermittent attack”: “A Distinguished Scientist.” *St. Louis Post-Dispatch*, April 17, 1966.
- 202 “sane, elegant, and informative”: Leonard 1969.
- 202 Studs Terkel: Terkel and Rosebury 1969.
- 202 Johnny Carson: Fine 2006.
- 202 “Since the United States”: Rosebury 1967.
- 202 an explosive series of stories: Hersh 1968.
- 203 young anti-war activists: Carter and Nelson 1968.
- 203 “Biological weapons have massive”: Nixon 1969, p. 968-9.
- 203 gave up its vast stockpile: Tucker 2002.
- 203 Biological Weapons Convention: United Nations Office for Disarmament Affairs n.d.
- 203 “Our entire stockpile”: Ford 1975.
- 204 “He knew the stuff”: TR. “Five Morbid Pieces.”
- 204 biological warfare labs: Rimmington 2018.
- 204 “But if our enemies”: Leitenberg et al. 2012, p. 25.
- 205 *Biohazard*: All quotations from Alibek in this section are from Alibek and Handelman 1999.
- 206 “inadvertent exposure of large numbers”: Quoted in Gwertzman 1980.
- 207 a biological weapons disaster: Meselson et al. 1994.
- 208 external threats: Fee and Brown 2001; Fearnley 2010.
- 209 biodefense: Long and Marzi 2021.
- 209 tuberculosis, malaria, and HIV: King 2004; Stefansson 2003.
- 210 “Luckily, I was not drafted”: WW to RC, October 25, 1951. CF, Series 13.9, Box 68, Folder 814.
- 210 “the suicide of bacteriology”: WW to R. M. Ferry, January 18, 1949. CF, Series 13.9, Box 68, Folder 813.
- 210 confirmed his theory: RH, May 1, 1947. 3677 University of Pennsylvania—Study of Air-Borne Infections. CF, Series 18, Box 270, Folder 2577.
- 210 “I only wish”: WW to RC, October 25, 1951. CF, Series 13.9, Box 68, Folder 814.

Chapter 10: Loch Raven

- 213 “This is a rather quiet corner”: WW to Cyril Tasker, March 23, 1948. CWP.
- 214 “I submit for your perusal”: WW to RH, September 17, 1948. CF, Series 13.9, Box 68, Folder 813.
- 214 “The sheer multitude”: RH to RC, September 21, 1948. CF, Series 13.9, Box 68, Folder 813.

- 214 "I am not too sure": RH, July 29, 1949. William F. Wells' Manuscript on Dynamics of Airborne Contagion. CF, Series 13.9, Box 68, Folder 813.
- 214 still in the fight: W. F. Wells 1951.
- 214 a matter of conjecture: Albert W. Snoke to JS, September 24, 1951. APS/JS.
- 214 more than forty-eight thousand American lives: Iskrant and Rogot 1953.
- 215 "We must feel": WW to JS, August 19, 1948. APS/JS.
- 215 "He is a true pioneer": JS to John Barnwell, July 6, 1948. APS/JS.
- 216 "When I get the outline": MW to EW, October 6, 1944. EWP, Box 2, Folder 34.
- 216 "There is one opportunity": EW to MW, October 9, 1944. EWP, Box 2, Folder 34.
- 216 William Holla: "Dr. Holla: Two-Fisted Fighter for County Health to Retire." *Daily Item*, December 29, 1955.
- 216 enjoyed the support: "500 Say 'Thank You' to Retiring Dr. Holla." *Mount Vernon Argus*, February 18, 1956.
- 216 "One can well cite": Holla 1949, p. 3.
- 217 Westchester: MW to EW, November 6, 1944. EWP.
- 217 "I feel wholly inadequate": MW to EW, February 14, 1945. EWP.
- 217 a generous thirty-two thousand dollars: "Violet Rays Head Off Measles and Chicken Pox in Trial Run." *New York Herald Tribune*, May 24, 1950.
- 217 Holla announced the launch: "Pleasantville to Make Community Test of Ultra-Violet Ray to Curb Child Diseases." *New York Times*, October 10, 1945.
- 217 "in the control": Quoted in "Experiment with Health Rays Pleases County Commissioner." *Daily Times*, June 27, 1946.
- 217 began spending weeks: WW to James Perkins, March 14, 1946. CF, Series 18, Box 270, Folder 2576.
- 217 "difficulties encountered in the application": Informal Discussion of Westchester Board of Health Commissioner's Office, May 23, 1946. Board of Health Minutes, 1948. Series 390 A-0540 (2) F. Westchester County Archives.
- 218 "the most patronized": M. W. Wells and Holla 1950.
- 218 a door-knocking campaign: Downes and Mertz 1953; Milbank Memorial Fund Records. Biographical and Historical Records. Group 845, Series 11, Box 29, Folder: Historical Records, Progress Reports, 1942-1950. Manuscripts and Archives, Yale University.
- 218 a full-page essay: Holla 1946.
- 218 scolded Holla: James Perkins to William Holla, March 12, 1946. CF, Series 18, Box 270, Folder 2576.
- 218 the experiment was already working: "Experiment with Health Rays Pleases County Commissioner." *Daily Times*, June 27, 1946, p. 14.
- 218 "These germs": "Special Lights Cut School Illnesses." *New York Times*, June 25, 1946.
- 219 "We are dubious": MW to Peter Huntington, February 10, 1947. APS/JS.
- 219 "I think you have": Geddes Smith to WW, September 21, 1948. CF, Series 13.9, Box 68, Folder 813.

- 220 send him to Europe: RH, July 20, 1949. Interview with Mr. William F. Wells. CF, Series 13.9, Box 68, Folder 813.
- 220 "Until now she has been": WW to JS, November 10, 1949. APS/JS.
- 220 He was finally rescued: RH, June 14, 1949. Comments Concerning Mr. William F. Wells' Proposed Book on Air-Borne Infection. Interview with Dr. Richard Riley. CF, Series 13.9, Box 68, Folder 813.
- 220 left Boston for New York: ER and RR, n.d. "Biography of the Riley Family." RRP, Box 4; RR to JS, February 1, 1940. APS/JS.
- 220 Aviation Medical Research Laboratory: Naval School of Aviation Medicine 1946.
- 220 "He was an aristocrat": Permutt 2002.
- 221 a barrier of immunity: "3-Year Test in 2 Villages Shows Ultraviolet Reduces Airborne Ills." *New York Times*, May 24, 1950.
- 221 Somers: Wells family, 1950 U.S. Census.
- 221 "Do you suppose": WW to RH, January 3, 1950. CF, Series 13.9, Box 68, Folder 813.
- 221 the results of the Pleasantville experiment: Wells and Holla 1950.
- 221 "Ultra-violet radiation disinfects": "Violet Rays Head Off Measles and Chicken Pox in Trial Run." *New York Herald Tribune*, May 24, 1950, p. 23.
- 222 paid for itself: "Holla Reports Success with Ultraviolet Ray." *Herald Statesman*, May 24, 1950.
- 222 Jean Downes: "Jean Downes 1893-1968." *Milbank Memorial Fund Quarterly* 47(1):9-10; Downes 1952.
- 222 no difference whatsoever: Downes 1951; "Epidemiology." *Public Health Reports* 65(50):1679-90.
- 222 "It is apparent": Downes 1950.
- 222 "It proved inconclusive": Westchester County Health Department, 1955. To Westchester's Good Health: A Silver Anniversary report on One County Department's War Against Disease and Disability. Westchester County Archives.
- 222 Richard Riley would puzzle: R. Riley 1980a.
- 222 "it contributed to the blackballing": RR to Don Smith, July 9, 1985. RRP, Box 6.
- 223 a decrepit colonial farmhouse: Delaware Public Archives. RG3555.021 Rolls 173-4. Recorder of Deeds; Kent County; Deed Books W-Z Vol. 18, 1949-50.
- 223 Pleasanton Abbey: Delaware Federal Writers' Project 1976; MacDonald 1954.
- 223 "We can't make": RC, April 25, 1950. Memorandum to Geddes Smith and Doctor Heffron. CF, Series 13.9, Box 68, Folder 813.
- 223 "improve the form": WW to RC, November 27, 1950. CF, Series 13.9, Box 68, Folder 814.
- 223 "I hope that I can find": WW to RC, January 8, 1951. CF, Series 13.9, Box 68, Folder 814.
- 223 "Will seems to have": MW to RH, March 30, 1951. CF, Series 13.9, Box 68, Folder 814.
- 224 "as I had to get": WW to RH, May 17, 1951. CF, Series 13.9, Box 68, Folder 814.
- 224 "The sad truth": WW to RC, February 27, 1952. CF, Series 13.9, Box 68, Folder 814.
- 224 "a goal beyond anything": WW to RC, June 29, 1951. CF, Series 13.9, Box 68, Folder 814.

- 224 "I hope this will not": WW to RC, July 9, 1951. CF, Series 13.9, Box 68, Folder 814.
- 224 "at last it has really": WW to RC, December 7, 1951. CF, Series 13.9, Box 68, Folder 814.
- 224 "I have read it": RC to RH, December 7, 1951. CF, Series 13.9, Box 68, Folder 814.
- 224 one VA hospital after another: JS to Henry Walters, August 21, 1951. APS/JS; JS to Theodore Moise, February 28, 1952. APS/JS; WW to RC, November 5, 1951. CF, Series 13.9, Box 68, Folder 814.
- 225 came to Wells's rescue: Joseph Lillienthal to JS, February 28, 1952. APS/JS; ER and RR, n.d. "Biography of the Riley Family." RRP, Box 4; R. Riley 2001.
- 225 "a bilious attack": WW to RC, March 24, 1952. CF, Series 13.9, Box 68, Folder 814.
- 225 more bad news: JS to Lewis Gundry, April 21, 1952. APS/JS; John Barnwell to JS, April 29, 1952. APS/JS.
- 225 Stokes called Roderick Heffron: JS to RH, May 5, 1952. APS/JS.
- 226 "I am sorry": RH to JS, May 29, 1952. APS/JS.
- 226 "that a man": JS to RH, June 16, 1952. APS/JS.
- 226 "Let's hope Mrs. Chase": RC, June 18, 1952. Memo. CF, Series 13.9, Box 68, Folder 815.
- 226 "Your patience served": WW to BC, January 28, 1953. CF, Series 13.9, Box 68, Folder 815.
- 226 "As I recede": WW to RC, May 7, 1952. CF, Series 13.9, Box 68, Folder 814.
- 226 "The whole of 'Book One'": WW to RC, October 6, 1952. CF, Series 13.9, Box 68, Folder 815.
- 226 "This about exhausts": WW to RC, December 10, 1952. CF, Series 13.9, Box 68, Folder 815. (Crane added his note to this letter.)
- 226 an international microbiology congress: International Congress for Microbiology 1953.
- 226 William spoke: W. F. Wells 1953.
- 227 Mildred talked: M. W. Wells 1953.
- 227 "We added one more stone": WW to BC, August 25, 1953. CF, Series 13.9, Box 68, Folder 819.
- 227 "it would be nice": WW to RC, September 11, 1950. CF, Series 13.9, Box 68, Folder 814.
- 227 take her name off: BC to RC, April 19, 1954. CF, Series 13.9, Box 68, Folder 816.
- 227 "I cannot believe": WW to BC, March 14, 1954. CF, Series 13.9, Box 68, Folder 816.
- 228 "Sanitary principles which": WW to BC, July 20, 1954. CF, Series 13.9, Box 68, Folder 821.
- 228 "Prejudice dies but": WW to BC, March 14, 1954. CF, Series 13.9, Box 68, Folder 816.
- 228 "I was shocked": MW to RC, April 17, 1954. CF, Series 13.9, Box 68, Folder 816.
- 228 "It's hard to tell": BC to RC, April 19, 1954. CF, Series 13.9, Box 68, Folder 816.
- 228 "As you know": BC to MW, April 19, 1954. CF, Series 13.9, Box 68, Folder 816.
- 228 "Thank you for your nice letter": MW to BC, April 1954. CF, Series 13.9, Box 68, Folder 816.
- 229 Mildred remained cordial: RC to Thomas Wilson, July 17, 1954. CF, Series 13.9, Box 68, Folder 816.
- 229 "Mr. Wells told me": RC to BC, April 26, 1954. CF, Series 13.9, Box 68, Folder 816.
- 229 "I think we broke": WW to BC, August 17, 1954. CF, Series 13.9, Box 68, Folder 816.

- 229 a paid consultant: WW to BC, September 27, 1954. CF, Series 13.9, Box 68, Folder 817.
- 229 "has been somewhat": JS to RR, February 12, 1954. APS/JS.
- 229 Loch Raven had a wing: ER and RR, n.d. "Biography of the Riley Family." RRP, Box 4.
- 229 prepped the rooms: R. Riley et al. 1957.
- 230 "This arrangement prevented": R. Riley 1960.
- 230 Cretyl Mills: "Interested." *Philadelphia Inquirer*, May 25, 1947.
- 230 "In a word": R. Riley 2001.
- 231 "Until I am thrown out": WW to BC, January 23, 1955. CF, Series 13.9, Box 68, Folder 817.
- 231 "After I looked": WW to RC, April 19, 1955. CF, Series 13.9, Box 68, Folder 817.
- 231 "The book is not": WW to BC, November 9, 1954. CF, Series 13.9, Box 68, Folder 817.
- 231 John J. Phair: Phair 1955.
- 231 Theodor Rosebury: Rosebury 1956.
- 232 "The only fly": WW to BC, June 14, 1955. CF, Series 13.9, Box 68, Folder 817.
- 232 "the deepest satisfaction": WW to RC, October 9, 1956. CF, Series 13.9, Box 68, Folder 817.
- 232 In a preliminary test: "V.A. Tests May Cut TB Infection Rate." *New York Times*, December 23, 1956.
- 232 filled with veterans: "Do TB Patients Really Spray Air with Germs?" *Pittsburgh Courier*.
- 232 "How long, oh Lord": WW to JS, December 27, 1955. APS/JS.
- 232 "You will be pleased": RR to JS, December 11, 1956. APS/JS.
- 232 seventy-one guinea pigs: R. Riley et al. 1959.
- 233 "These ideas do not constitute": R. Riley 1957.
- 233 "It always does me": JS to RR, January 14, 1958. APS/JS.
- 233 "If and when": WW to RC, October 9, 1956. CF, Series 13.9, Box 68, Folder 817.
- 233 "I have come back": WW to RC, July 1, 1957. CF, Series 13.9, Box 68, Folder 817.
- 234 she died of cancer: ER and RR, n.d. "Biography of the Riley Family." RRP, Box 4.
- 234 a short obituary: "Mrs. William F. Wells." *News Journal*, February 25, 1957.
- 234 "Wells kept in touch": R. Riley 2001.
- 235 "Maybe the guinea pigs": Ibid.
- 235 "This may profoundly modify": WW to JS, May 6, 1957. APS/JS.
- 235 A vast wave of influenza: Rusk 1957.
- 235 "Throughout each day": "Hong Kong Battling Influenza Epidemic." *New York Times*, April 17, 1957.
- 235 Maurice Hilleman: Offit 2007.
- 236 "The Livermore study": RR to JS, September 25, 1957. APS/JS.
- 236 "will not be ended": WW to RC, July 19, 1957. CF, Series 13.9, Box 68, Folder 817.
- 236 reached the United States: Kaplan 1957.
- 236 more than a million worldwide: Viboud et al. 2016.
- 236 "The mission of the sanitarian": WW to RC, February 10, 1958. CF, Series 13.9, Box 68, Folder 817.

- 236 "I hope these running notes": WW to RC, December 7, 1957. CF, Series 13.9, Box 68, Folder 817.
- 237 "I have been wanting": JS to RR, January 14, 1958. APS/JS.
- 237 "having weathered the cold weather": RR to JS, March 19, 1958. APS/JS.
- 237 collapsed on his farmhouse floor: RR to JS, September 22, 1958. APS/JS.
- 237 His oatmeal diet: ER and RR, n.d. "Biography of the Riley Family." RRP, Box 4.
- 237 Wells raved: R. Riley 2001.
- 237 "We continue to discuss": RR to JS, September 22, 1958. APS/JS.
- 238 "It was impossible": M. A. Tarumianz to N. Maxon Terry, February 23, 1959. APS/JS.
- 238 "This came as no surprise": RR to JS, March 2, 1959. APS/JS.
- 238 a trusteeship: Delaware Public Archives. RG3555.021 Roll 017. Grantor/Seller Index; Kent County. Grantor W-Z, Corporations A-L, 1873-1959. William Sr. represented William Jr., a mentally ill person. Deed Book O 22 p. 505.
- 238 the ultraviolet light experiment finally began: Cretyl Mills to RC, April 8, 1962. "Biography of the Riley Family." CF, Series 13.19, Box 68, Folder 818.
- 239 masks might help: R. Riley 1980c.
- 239 "To achieve the prerequisites": R. Riley 1959.
- 239 "The individual would be relieved": R. Riley and O'Grady 1961, p. 168.
- 240 direct his lawyer: Jane Massey to RC, September 10, 1958. CF, Series 13.9, Box 68, Folder 818.
- 240 "I make note": WW to RC, November 19, 1959. CF, Series 13.9, Box 68, Folder 818.
- 240 "It seems therefore": RC to WW, November 20, 1959. CF, Series 13.9, Box 68, Folder 818.
- 240 "This study was designed": Jordan 1961, p. 36. See also Wehrwein 1959.
- 241 "Their epidemic control": Ross McLean to William Tucker, February 23, 1960. APS/JS.
- 241 "The question is": R. Riley and O'Grady 1961, p. 163.
- 241 "I was hospitalized myself": Cretyl Mills to RC, April 8, 1962. CF, Series 13.9, Box 68, Folder 818.
- 241 Riley went to Loch Raven: Riley recounted Wells's final months in R. Riley 2001 and "Biography of the Riley Family."
- 242 William Firth Wells died: "William Firth Wells." *Evening Sun*, October 10, 1963.
- 242 "The end came": Clara W. Masland to JS, 1963. APS/JS.
- 242 Cretyl Mills traveled: Cretyl Mills to JS, September 21, 1964. APS/JS; RC, October 23, 1964. Excerpt from letter to Mr. Crane from Mrs. Cretyl Crumb Mills. CF, Series 13.9, Box 68, Folder 818.
- 242 "the final proof": JS to Cretyl Mills, December 14, 1964. APS/JS.
- 243 the production of penicillin: Hare 1982.
- 243 nothing changed his mind: Hare 1945. See also "The Control of Air-Borne Infection." *Br Med J* 2(4482):820-1. doi:10.1136/bmj.2.4482.820.
- 243 spacing out the bunks: Hare 1943.
- 243 "Despite the contentions": Hare 1964.

- 243 his own eulogy of sorts: Langmuir 1964.
- 244 distorting Wells's ideas: Randall et al. 2021.
- 244 a major misunderstanding: Molteni 2021.
- 244 little incentive: Roy and Milton 2004.
- 245 "The future appears": Waksman 1964, p. 214.
- 245 last part of the tuberculosis experiment: RR to Lee B. Reichman, June 22, 1993. RRP, Box 6.
- 245 Pilot Ward had been reclaimed: Ed Nardell to Phil Brickner, January 26, 1996. RRP, Box 6.
- 245 a Baltimore junior college: "14 Full-Time Members to Join B.J.C. Staff." *Evening Sun*, August 15, 1962.

Chapter 11: The Brothers Riley

- 246 small-scale experiments: R. Riley and Kaufman 1971; R. Riley and Permutt 1971.
- 246 sealed his office: R. Riley, Knight, and Middlebrook 1976.
- 246 searching for natural experiments: RR, 1970. "New Aspects of Tuberculosis." RRP, Box 3; R. Riley 1974.
- 246 USS *Richard E. Byrd*: Houk 1980; Houk et al. 1968a; Houk et al. 1968b.
- 247 diagnosed with smallpox: Sullivan 1970; Tewogbola and Aung 2021; Wehrle et al. 1970.
- 247 Ed Riley: ER and RR, n.d. "Biography of the Riley Family." RRP, Box 4; ER, n.d. "More biography 6-5-94." RRP, Box 4.
- 247 "I shared Wells' conviction": E. Riley 1980b, p. 25.
- 248 in just six months: Sencer, Dull, and Langmuir 1967.
- 248 "I have rarely": Langmuir 1987, p. 355.
- 248 Linus getting vaccinated: Schultz 1967.
- 249 "In my opinion": R. Riley 1976, p. 577.
- 250 They recommended rejection: John P. Fox to RR. August 16, 1977. RRP, Box 1.
- 250 "This is an original contribution": RR to John P. Fox. September 4, 1977. RRP, Box 1.
- 250 "Airborne Spread of Measles": E. Riley, Murphy, and R. Riley 1978.
- 250 "This is something": RR to ER, June 3, 1977. RRP, Box 1.
- 251 "rather egregious blunder": Langmuir 1980.
- 251 "sinned grievously": Langmuir 1987.
- 251 "I am happy": ER to RR, July 26, 1993. RRP, Box 6.
- 251 "carry on the gospel": ER to RR, June 20, 1993. RRP, Box 6.
- 252 "These are the grubby kinds": RR to Don Smith, May 22, 1992. RRP, Box 6.
- 252 not the only disease: R. Riley 1977; R. Riley 1980b.
- 252 sick building syndrome: Sadler 2016.
- 252 raised the prospect: R. Riley 1988.
- 252 "The construction of tighter buildings": Ibid., p. 193.
- 252 "The medical profession": R. Riley 1980a.
- 253 The turnaround: Chowder 1992.

- 253 continued to drop: Farmer 1999.
- 254 “the gay plague”: Quoted in Eilperin 2013.
- 254 a crisis in homelessness: Centers for Disease Control and Prevention 1985.
- 254 a single Pine Street Inn guest: Nardell et al. 1986.
- 255 some promising signs: Nardell, McInnis, and R. Riley 1988; R. Riley and Nardell 1989.
- 255 “If just one case”: R. Riley and Nardell 1989.
- 255 remove the stigma: RR to Don Smith, July 9, 1985. RRP, Box 6.
- 255 urged other hospitals: First et al. 1999; Nadler et al. 1992.
- 255 “He is courageous”: RR to L. Jack Failing, December 2, 1993. RRP, Box 6.
- 255 sway government regulators: National Institute for Occupational Safety and Health 1995; Nardell 2015.
- 255 *Airborne Contagion*: National Institute for Occupational Safety and Health 1993.
- 256 like astronaut helmets: Fennelly 1997.
- 256 Sara Little Turnbull: Sources include Abdelfatah and Arablouei 2020; Rees and Eisenbach 2020; Wilson 2020.
- 256 Peter Tsai: Allain 2022; Tsai 2020; Tsai and Tsai 2020; Yam 2020.
- 257 The new tuberculosis guidelines: National Institute for Occupational Safety and Health 1995; Centers for Disease Control and Prevention 1994.
- 257 some doctors complained: Nelson 1992.
- 257 Mark Nicas: Nicas 1995.
- 257 “Unfortunately, I’ve witnessed”: Mark Nicas to RR, June 29, 1993. RRP, Box 6.
- 257 Philip Brickner: Wald 1994.
- 258 no overall difference: Brickner and Vincent 2013; Nardell et al. 2008.
- 258 Solbert Permutt: Brower and Sylvester 2012.
- 258 on a napkin: Mateus 2023.
- 259 “Thus ended the career”: R. Riley 2001, p. 8.
- 259 he died at ninety: Koenig 2001.
- 259 prisons in Siberia: Keshavjee et al. 2008.
- 259 about 80 percent: Mphaphlele et al. 2015.
- 259 “conditional recommendation based”: World Health Organization 2019b, p. xvi.
- 260 “airborne precautions”: Garner 1996; Garner and Hospital Infection Control Practices Advisory Committee 1996.
- 260 “may remain suspended”: Garner and Hospital Infection Control Practices Advisory Committee 1996, p. 65.
- 260 “generally travel only short distances”: Ibid., p. 63.

Chapter 12: Sacks of Sugar, Vials of Powder

- 261 Joshua Lederberg: Sapp 2021.
- 261 “It is hard to imagine”: Lederberg 1988b, p. 358.
- 261 “suicidal policies of biological warfare”: Lederberg 1970.

- 261 natural microbes: Lederberg 1988a.
- 262 “The idea of a totally new”: Fauci 2024, p. 36.
- 262 The Soviet Union: Boghardt 2009.
- 262 “There is no medical authority”: Quoted in Thomas 1985.
- 262 the New School for Social Research: Mack 1988.
- 262 “lead the way”: New School Center for Public Scholarship 2016.
- 263 “Our principal competitors”: Lederberg 1988b, p. 347.
- 264 “Interesting, he thought”: Crichton 1969, p. 127.
- 264 “you might find ways”: Joshua Lederberg to D. D. Coradimi (?), 1973.
<https://mhm.nlm.nih.gov/spotlight/bb/catalog.nlm:nlmuid-101584906X18804-doc>.
- 264 two hundred leading scientists: Marwick 1989.
- 264 “I think that”: Weiss 1989, p. 201.
- 265 “certainly induced a lot”: Institute of Medicine 2009, p. 85.
- 265 plenty of stories: Culliton 1990; Morse and Schluederberg 1990; Institute of Medicine 1992.
- 265 Influenza experts explained: Webster 2023.
- 265 Ebola: Jacob et al. 2020; Centers for Disease Control and Prevention 2023; Weyer, Grobbelaar, and Blumberg 2015.
- 266 “I can tell you”: Quoted in Weiss 1989.
- 266 sprays of droplet nuclei: Smith 1984; U.S. Army Medical Research Institute of Infectious Diseases 1979.
- 266 the world’s most dangerous pathogens: Alibek 1999.
- 267 a shipment of monkeys: Dalgard et al. 1992.
- 267 Iraq: Braut-Hegghammer 2020; Coll 2024; U.K. Government 2002; Zilinskas 1997.
- 268 “In principle, biological weapons”: U.S. Congress Office of Technology Assessment 1993, p. 52.
- 269 “Crisis in the Hot Zone”: Preston 1992.
- 269 Stephen Morse: Morse 1991.
- 269 Nancy Jaax: Jaax et al. 1995.
- 269 “a kind of airborne Ebola flu”: Preston 1994.
- 269 “The single biggest threat”: Quoted in Petersen 1995.
- 269 the true nature: Smith 2014a.
- 269 lobbying: Lederberg 1997.
- 270 “the dangerous link”: Quoted in Wright 2007, p. 72.
- 271 “can do a lot”: Quoted in Coll 2024, p. 394.
- 271 “The likelihood of there”: Quoted in Wright 2007.
- 271 A few skeptics: Leitenberg 1999; Leitenberg 2009; Pringle 1998.
- 272 “I don’t know”: Quoted in Wright 2007, p. 100.
- 272 “Everything I heard”: Clinton 2004, p. 789.
- 272 dangerously close to violating: Miller, Engelberg, and Broad 2001b.
- 272 “to aid our preparedness”: Clinton 1999, p. 828.

- 272 “the first ever civilian stockpile”: Clinton 1999, p. 85.
- 272 Joshua Lederberg: Miller et al. 2001a.
- 272 “because I then had”: Clinton 1999, p. 85.
- 272 created a game: Block 2001; Borio et al. 2002.
- 273 outbreak of pneumonic plague: Inglesby et al. 2000; O’Toole and Inglesby 2001.
- 273 Kenneth Bernard: Dilanian, de Luce, and Lehren 2020.
- 273 smallpox: Meltzer et al. 2001; O’Toole 1999.
- 273 Dark Winter: Barrett 2006; O’Toole, Mair, and Inglesby 2002.
- 273 hijacked planes: Hoffman 2001.
- 274 the air at the crash sites: Guillemin 2011.
- 274 “Smallpox could bring”: Gordon and Cruz 2001.
- 274 Bush was briefed: Bush 2010.
- 275 “You can not stop us”: Quoted in Guillemin 2011, p. 79.
- 275 “I was struck”: Bush 2010, p. 157.
- 275 “It appears to have foreshadowed”: U.S. Senate Committee on Armed Services 2002.
- 275 “We have copies”: Quoted in Graysmith 2003, p. 79. It would later come to light that al Qaeda leader Ayman al-Zawahiri read Theodor Rosebury’s *Peace or Pestilence*. See Cullison 2004.
- 276 Amerithrax: Inglesby et al. 2002.
- 276 Project BioShield: Fauci 2024.
- 276 unveil Project BioShield: Bush 2003.
- 276 “Less than a teaspoon”: Powell 2003.
- 277 They found none: Miller 2003; U.S. Department of State 2005.
- 277 More than a half million: Bump 2018.
- 277 “We believed it because”: deYoung 2006, p. 493.
- 277 The search for the Amerithrax killer: National Research Council 2011.
- 277 Ivins died by suicide: Engelberg 2011.
- 278 BioWatch: U.S. Government Accountability Office 2021.
- 278 “Put simply”: Bipartisan Commission on Biodefense 2024, p. 10.
- 278 “The American people”: Quoted in Koplow 2008.

Chapter 13: Sea, Land, Fire, Clouds

- 281 Paul Comtois and Scott Isard: Comtois 1999; Comtois and Isard 1999.
- 281 growing up at last: Sources include Alsante, Thornton, and Brooks 2021; Archer et al. 2023; Fröhlich-Nowoisky et al. 2016; Lang-Yona et al. 2022; Lappan et al. 2024; Šantl-Temkiv et al. 2022; Schmale and Ross 2015.
- 282 climbed Mount Melbourne: Brown and Hovmøller 2002; Skotnicki et al. 2001.
- 282 Salt Lake City: Radosevich et al. 2002.
- 283 a giant wave machine: Prather et al. 2013.
- 284 a fizz of bubbles: Deicke 2022; Gao, Deane, and Shen 2021.

- 286 odd beanlike shapes: Dommer et al. 2023.
- 286 cargo planes of the aerobiome: Michaud et al. 2018.
- 286 R/V *Hespérides*: Duarte 2015; Mayol et al. 2017.
- 286 scrambling the diversity: Breitbart and Rohwer 2005.
- 286 the Dry Valleys of Antarctica: Archer et al. 2019.
- 286 biological soil crusts: Garcia-Pichel 2023; Thomazo et al. 2020.
- 287 a rubbery goo: Flemming and Wuertz 2019.
- 287 A single grain: Probandt et al. 2018.
- 287 3.2 billion years: Korenaga 2021; Selden 2021.
- 287 across entire continents: Beraldi-Campesi 2013.
- 287 gave way to plants: Bowman 2022.
- 287 Fungi moved onshore: Berbee et al. 2020; Rimington et al. 2020; Strullu-Derrien et al. 2023.
- 287 six million moss spores: Sundberg 2013.
- 288 releasing pollen grains: Cruden 2000.
- 288 speed up their pollen grains: Timerman and Barrett 2021.
- 288 Some fungi pack spores: Golan and Pringle 2017; Lagomarsino-Oneto et al. 2020; Schmale and Ross 2017.
- 288 The gills of the mushrooms: Iapichino et al. 2020.
- 288 evolved adaptations: Kim et al. 2019; Roper and Seminara 2019.
- 288 pop out of the tubes: Bueno-Sancho et al. 2021.
- 289 a second wave of spores: Dressaire et al. 2016; Roper et al. 2010.
- 289 bacteria and algae: Tesson et al. 2016.
- 289 float for twenty-five miles: Williams 2010.
- 289 “There were so many”: Athenaeus 2010.
- 289 425 million years: Brookfield, Catlos, and Suarez 2022.
- 290 9.3 trillion insects: Huang et al. 2024.
- 290 ten thousand species: Callaghan, Nakagawa, and Cornwell 2021.
- 290 430 million years: Glasspool and Gastaldo 2023.
- 291 1.5 million square miles: Lang and Moeini-Meybodi 2021.
- 291 Leda Kobziar: Kobziar and Thompson 2020; McKenna 2022b.
- 291 The leaves and bark: Davey et al. 2009; Vacher et al. 2016.
- 291 Fishlake National Forest: Kobziar et al. 2022.
- 292 By her calculations: Kobziar et al. 2024; Gering et al. 2024.
- 292 more than 100,000 tons: Amato et al. 2023.
- 292 a common swift: Hedenström et al. 2016.
- 292 Puy de Dôme: Deniel et al. 2020; Miallier et al. 2010.
- 293 Clouds: Sources include Amato et al. 2005; Baray et al. 2020; Péguilhan et al. 2023.
- 293 “Clouds are environments”: Amato et al. 2017, p. 14.
- 294 bacteria eat clouds: Griffin 2021; Khaled et al. 2021.
- 294 alters the weather: Boxall 2013.

- 294 fungi, algae, pollen, lichens, insects, bacteria, and viruses: Adams et al. 2021.
- 294 encouraging water to freeze: Huang et al. 2021; Lukas et al. 2022.
- 294 *Pseudomonas*: Hartmann et al. 2022.
- 294 plants welcome bacteria: Hamilton 1996; Hamilton and Lenton 1998; Morris et al. 2014.
- 295 Venus: Morowitz and Sagan 1967; Seager et al. 2021.
- 295 forty-eight miles: Imshenetsky, Lysenko, and Kazakov 1978.
- 295 the stratosphere is alive: Cortesão et al. 2021; Smith and Waters 2019.
- 296 *Bacillus luciferensis*: Griffin 2004; Logan 2002.
- 296 ravaged by ultraviolet light: Khodadad et al. 2017.

Chapter 14: We're All Going to Get It

- 297 The new pandemic: My account of SARS draws on sources including Abraham 2005; Campbell 2006; Greenfeld 2020; Hui and Zumla 2019; Kleinman and Watson 2006; Peiris et al. 2003; Quammen 2012; Rosenthal 2003; World Health Organization 2006.
- 297 “atypical pneumonia”: Grady 2003.
- 298 Guangzhou: Zhao et al. 2003.
- 299 H5N1: World Health Organization 2014a.
- 300 finally laid eyes: Altman 2003a; Altman 2003c; Altman and Landler 2003.
- 300 coronavirus vaccines: Tizard 2020.
- 301 “It is beginning”: Bradsher 2003.
- 301 doubted their value: “Doctors’ Board Urges Isolation in Flu Epidemic.” *Sacramento Bee*, December 14, 1928.
- 301 in many Asian countries: Yang 2014.
- 301 Japan: Burgess and Horii 2012; Horii 2014.
- 301 Masks had debuted early in China: Wei 2020.
- 301 “Using it to cover”: Zhang 2023.
- 302 protect their lungs from smog: Hansstein and Echeagaray 2018.
- 302 scrambling to find masks: Gong 2022.
- 302 cultural practice of masking: Baehr 2008; Lynteris 2020.
- 302 Amoy Gardens: SARS Expert Committee 2003; Hong Kong Department of Health 2003; Shadbolt 2013.
- 303 how currents flow: Dai et al. 2003.
- 303 Kaixi Wang: Greenfeld 2006.
- 303 sickened 138 people: Lee et al. 2003.
- 304 “We’re not talking”: Quoted in “SARS: How One Man Infected 324 Others.” *Sydney Morning Herald*, April 18, 2003.
- 304 the Prince of Wales Hospital: Li et al. 2005.
- 305 come from Canada: Campbell 2006; Varia et al. 2003.
- 306 added Toronto to a list: Altman and Bradsher 2003.
- 306 “If we don’t have”: Quoted in Crowe 2003.

- 306 a single patient: Scales et al. 2003.
- 306 Others argued: Johnston and Conly 2004.
- 306 “There is compelling evidence”: Conly 2006, p. 264.
- 306 “Part of the heated debate”: Campbell 2006 p. 11.
- 307 “It was eerie”: Quoted in Altman 2003b.
- 307 “No...Canadians”: Schorr 2003.
- 307 isolating them: Shaw 2006.
- 307 “As April turned”: Greenfeld 2020.
- 308 “We were lucky this time”: World Health Organization 2006, p. 243.
- 308 spill over into our species: Morse 2004.
- 309 “The main mode”: World Health Organization 2006, p. 193.
- 309 Li then considered: Yu et al. 2005.
- 309 a vast cloud: Yu et al. 2004.
- 311 pollution coming from cars: Ristovski et al. 2000.
- 311 smoke rising from cigarettes: Morawska, Barron, and Hitchins 1999.
- 311 “less than basic”: Morawska 2006, p. 336.
- 312 poked their heads: Johnson et al. 2011; Morawska et al. 2009.
- 312 only a small fraction: Morawska et al. 2022.
- 312 Lydia Bourouiba: Bourouiba 2021a; Bourouiba 2021b; Bourouiba, Dehandschoewercker, and Bush 2014.
- 313 “If nature were”: Quoted in Bourouiba 2008.
- 313 the spread of influenza: Bourouiba, Teslya, and Wu 2011.
- 313 new pictures of sneezes: Lok 2016.
- 313 tickling their noses: Driscoll and Groskin 2017.
- 314 “I am definitely”: Quoted in Science Friday 2014.
- 314 “seems overly simplified”: Bourouiba 2020, p. 1837.

Chapter 15: A State of Preparedness

- 315 another major speech: Harris 2005a.
- 315 an even more ambitious plan: U.S. Department of Health and Human Services 2005.
- 315 “Three years ago”: Bush 2005.
- 316 “You’ve got to read”: Quoted in Mosk 2020.
- 316 kill millions of Americans: Harris 2005b.
- 316 one more form of biological warfare: Rosenthal 2021a.
- 317 chickens, ducks, and pigs: Davis 2005.
- 317 the crippling neglect: Weber et al. 2020.
- 317 inflict more damage: Pear 2005; Stolberg 2002.
- 317 “The amount of”: Homeland Security Council 2005, p. S4-3.
- 318 three feet away: Homeland Security Council 2006.
- 318 an airplane in Alaska: Moser et al. 1979.

- 318 “Recommending the use”: Tellier 2006, p. 1660. See also Tang and Li 2007.
- 318 Tellier’s opponents: Brankston et al. 2007.
- 318 “Effective aerosol transmission”: Lemieux et al. 2007, p. 173.
- 319 less than a thousandth: Morse, Garwin, and Olsiewski 2006; Aiello et al. 2010.
- 319 wearing surgical masks: Cowling et al. 2008; Cowling et al. 2009.
- 320 cotton lung: Milton 1993.
- 320 the Polaroid Corporation: Milton, Glencross, and Walters 2000.
- 320 cold viruses in the air: Myatt et al. 2004.
- 321 “As perplexing as”: Roy and Milton 2004.
- 322 Gesundheit II: Gerone et al. 1966; McDevitt et al. 2013.
- 322 small particles contained: Milton et al. 2013.
- 322 Gesundheit II hinted: Aiello et al. 2010.
- 322 two children: Centers for Disease Control and Prevention 2009a.
- 322 infecting other people: Centers for Disease Control and Prevention 2009c; McNeil 2009.
- 322 2009 H1N1: Centers for Disease Control and Prevention 2009b; Centers for Disease Control and Prevention 2010b.
- 323 Adela María Gutiérrez: Lacey and Malkin 2009b.
- 323 gotten its start: Reimering, Muñoz, and McHardy 2020.
- 323 Mexico closed schools: Lacey and Malkin 2009a; Lacey and McNeil 2009.
- 323 Hong Kong: Bradsher 2009.
- 323 88 percent of people: Lau et al. 2010.
- 324 “What I knew”: Obama 2020, p. 385.
- 324 launched an effort: Centers for Disease Control and Prevention 2007.
- 324 based on the assumption: Chan 2009.
- 324 recommended washing hands: Parker-Pope 2009.
- 324 In hospitals: Centers for Disease Control and Prevention 2010a.
- 324 85 million N95s: Reinhard and Brown 2020.
- 324 Joe Biden: Korecki 2020.
- 324 “a gaffe machine”: Quoted in Saenz 2018.
- 325 “I wouldn’t go anywhere”: Quoted in Lee and Parnes 2009.
- 325 “Debate continues about”: Institute of Medicine 2007, p. 46-7.
- 325 “The vice president’s advice”: Seifman 2009.
- 326 “We can’t hasten”: Quoted in Branswell 2009.
- 327 smaller than five microns: See, for example, Wenzel 2003.
- 328 a quarter of all people: Van Kerkhove et al. 2013.
- 328 an estimated 203,000: Simonsen et al. 2013.
- 328 an average year of seasonal flu: Paget et al. 2019.
- 328 looked back at 2009: Nicoll et al. 2010.
- 328 ripped through hospitals: Jaeger et al. 2011.
- 329 accidental needle sticks: Michaels and Barab 2020.

- 330 hold a meeting: Snider, Bridges, and Weissman 2010.
- 330 Mark Loeb: Loeb et al. 2009.
- 331 spend two days: Killingley et al. 2012.
- 331 played Monopoly: ICFUST 2023.
- 331 EMIT ended in disappointment: Nguyen-Van-Tam et al. 2020.
- 332 “Research over the years”: Seto et al 2013.
- 332 draw some lessons: World Health Organization 2014b.
- 332 Saudi Arabia: Zaki et al. 2012.
- 333 South Korea: Sang-Hun 2015.
- 333 travel through the air: Kim et al. 2016.
- 333 “We talked about”: Quoted in Dulaney 2020.
- 333 *The Hot Zone* and *Outbreak*: Smith 2014b.
- 333 sent letters to newspapers: Land 2014.
- 333 “We must consider”: Osterholm 2014.
- 334 publish a web page: Centers for Disease Control and Prevention 2016.
- 334 “Tony, explain to me”: Quoted in Wilson 2018, p. 124.
- 334 Ebola never became airborne: Holmes et al. 2016.
- 334 a pandemic playbook: Diamond and Toosi 2020.
- 334 “rapid airborne transmission”: National Security Council 2016, p. 30.
- 334 the Strategic National Stockpile: Frontz 2023; Lovelace, Bauer, and Torres 2022.
- 335 secure enough money: Torbati and Arnsdorf 2020.
- 335 replenish the masks: U.S. Senate Committee on Homeland Security & Governmental Affairs 2022.
- 335 “really stupid”: Quoted in Toosi, Lippman, and Diamond 2020.
- 335 promptly abandoned it: Mann 2020.
- 335 fired the pandemic czar: Sun 2018.
- 335 how long the virus could survive: Yang and Marr 2011; Yang, Elankumaran, and Marr 2011.
- 336 “How does this community”: Linsey Marr, personal communication, August 26, 2022.
- 336 a talk at TEDMED: Bourouiba 2018.
- 336 the Gesundheit II experiment: Yan et al. 2018.
- 336 A television reporter asked Fauci: Matter of Fact 2018.
- 337 updated its guidelines: U.S. Department of Health and Human Services 2017.
- 337 a new pandemic game: Cara 2019; Johns Hopkins Center for Health Security 2019b; Stern 2023.
- 337 Disease X: Crilly 2018; World Health Organization 2018.
- 338 Tijuana: Stahl 2020.
- 339 sewage bacteria in the winds: Pendergraft et al. 2023.

Chapter 16: Disease X

- 343 Zhang Jixian: My account of Zhang Jixian is drawn from sources including Global Times Staff Reporters 2020; Juengling et al. 2020; Li et al. 2020b; McCarthy et al. 2020; Patranobis 2020; Yang 2020; Yuan et al. 2020.
- 343 something she might have expected: Müller et al. 2003; Ooi and Daqing 2003.
- 344 “Something is definitely wrong!”: Quoted in Yang 2024, p. 53.
- 344 “At the end”: Quoted in Yang 2024, p. 68.
- 344 “So far the investigation”: Wuhan Municipal Health Commission 2019.
- 345 infect fourteen people: Buckley et al. 2020.
- 345 Mr. X: Cheng et al. 2022a; Ou et al. 2022.
- 346 a crowded restaurant: Lu et al. 2020.
- 347 “that the virus”: U.S. Senate Committee on Homeland Security & Governmental Affairs 2022, p. 80.
- 347 a ban on flavored e-cigarettes: Ballhaus and Armour 2020.
- 347 his well-known germophobia: Guarino 2017; Sharman 2017.
- 347 “I think it’s”: Lawrence 2005, p. 71.
- 347 new campaign staffers: Lippman 2019.
- 347 Anthony Scaramucci: Raskin 2018.
- 347 the first case: Harmon 2020.
- 347 “We have it”: Belvedere 2020.
- 348 “Forget SARS”: Quoted in Covid Crisis Group 2023, p. 88.
- 348 “We pretty much”: Quoted in Bump 2020.
- 348 “very tricky”: Quoted in Woodward 2020, p. xix.
- 348 South Korea: Kim 2020; Shuren and Stenzel 2021.
- 348 failed spectacularly: Shear et al. 2020.
- 348 researchers in Germany: Rothe et al. 2020.
- 348 substantial undocumented infections: Li et al. 2020a.
- 350 a live press conference: United Nations 2020; World Health Organization 2020b.
- 351 “Covid-19 is transmitted”: World Health Organization 2020d.
- 352 “Maintain at least”: World Health Organization 2020a.
- 352 “I don’t think”: Quoted in Greenfieldboyce 2020.
- 352 bigger than five microns: Tang et al. 2021.
- 352 news outlets: Sheikh et al. 2020.
- 353 Shelly Miller: Hedington 2021; Miller 2002.
- 353 Lawrence Garbuz: Brody 2021.
- 353 taking place indoors: Qian et al. 2021.
- 353 enshrouded diners: Li et al. 2021.
- 354 fomites were not spreading: See also Goldman 2020.
- 354 Rick Bright: Bright 2020b; Gibney 2020; U.S. Senate Committee on Homeland Security & Governmental Affairs 2022.

- 354 ten thousand people: Cheung and Lum 2020.
- 354 “I can’t believe”: Bright 2020a.
- 354 Americans were buying: Cerullo 2020.
- 355 “Should you wear”: Cramer and Sheikh 2020. The following day, Mike Ryan echoed Redfield’s comment at a WHO briefing. “The most important thing everyone can do is wash your hands, keep your hands away from your face and observe very precise hygiene,” he said.
- 355 *60 Minutes*: Farmer 2020.
- 356 on its website: Centers for Disease Control 2020c.
- 356 six feet away: Centers for Disease Control 2020b.
- 356 “Avoid the ‘Three Cs!’”: Government of Japan 2020. See also Oshitani 2022.
- 358 fifteen days: Johnson et al. 2020; Olorunnipa et al. 2020; White House 2020a.
- 358 700,000 Americans: Frank 2020.
- 358 John Lowe: Santarpia et al. 2020a; Santarpia et al. 2020b.
- 359 “consistent with aerosolization”: National Academies of Sciences, Engineering, and Medicine 2020, p. 38.
- 359 “I wouldn’t go”: Quoted in Xia 2020.
- 360 a warning of her own: Bourouiba 2020.
- 360 *USA Today* reported: Culver 2020.
- 360 “There is a professor”: Garger 2020; U.S. Department of State 2020.
- 361 John Conly: Blackwell 2021; Miller and Collins 2021.
- 361 vigorously dismissing airborne infection: Lewis 2020; World Health Organization 2020c.
- 361 “FACT: #COVID19 is NOT airborne”:
<https://twitter.com/WHO/status/1243972193169616898>.
- 362 “Dear Dr. Tedros”: Morawska et al. 2023.
- 363 “After the call”: Ibid.
- 363 “A Choir Decided”: Read 2020a.
- 364 “Skagit County Public Health”: Skagit County 2020a.
- 364 Nancy Ann Hamilton: Hutchinson 2020; Jones 2020.
- 364 “Nicki Hamilton loved”: Quoted in Stern 2020.
- 364 Carole Rae Woodmansee: Macdonald 2020.
- 365 “The hardest thing”: Quoted in Valdes 2021.
- 365 “One can only imagine”: Quoted in Tingley 2021.
- 365 earned the praise: Waldstein 2020.
- 366 final report: Hamner et al. 2020.
- 366 a letter cautioning: Skagit County 2020b.

Chapter 17: History Set Us Up

- 367 discouraged their staffs: Alltucker 2020.
- 367 “UR WEARING IT”: Quoted in Richtel 2020.
- 367 brittle rubber bands: Gibney 2020.

- 367 “I feel like”: Quoted in Schwirtz 2020.
- 368 Matthew Pottinger: Birx 2022; Wright 2021.
- 368 an unexpected new ally: Goodnough and Sheikh 2020; Mandavilli 2020a; Sun and McGinley 2020.
- 368 Kirkland: Fields and Hudetz 2020; Hudetz et al. 2020; Kimball et al. 2020.
- 368 cloth masks: These studies included Davies et al. 2013 and Macintyre et al. 2015.
- 368 make cloth masks at home: Centers for Disease Control 2020a.
- 368 “The CDC is recommending”: White House 2020b.
- 368 “The thinking is”: Quoted in PBS Newshour 2020.
- 368 “Americans wanted and needed”: Birx 2022, p. 181.
- 369 “equates wearing a mask”: Quoted in Forgey 2020.
- 369 “I just don’t want”: Quoted in Victor, Serviss, and Paybarah 2020.
- 369 “Based on the trend”: Morawska and Cao 2020.
- 369 Supermarkets: Harris 2020.
- 369 drift around them: Gnegy-Spencer et al. 2023.
- 369 Sanjay Gupta: Doherty 2020.
- 370 “The immensity of such”: “An Incalculable Loss.” *New York Times*, May 24, 2020.
- 370 “For society to resume”: Prather et al. 2020.
- 372 “Transmission of SARS-CoV-2”: It would later be published in the journal *Indoor Air* as Miller et al. 2021.
- 373 the open letter: Morawska and Milton 2020.
- 373 “We are 100 percent”: Quotes in Read 2020b.
- 373 brushed off questions: World Health Organization 2020f.
- 373 “Especially in the last couple”: Quoted in Mandavilli 2020b.
- 373 “Short-range aerosol transmission”: World Health Organization 2020e.
- 373 “opinion pieces”: Conly et al. 2020.
- 374 “This has resulted”: Chagla et al. 2020.
- 374 Economic inequality: Karnik et al. 2023; Michaels et al. 2024.
- 374 Meatpacking workers: Kaplan et al. 2020; Klein et al. 2020; Taylor et al. 2020.
- 375 keep the plants running: Select Subcommittee on the Coronavirus Crisis 2022b.
- 375 \$13,494: Michaels et al. 2024.
- 375 Americans of color: Bassett 2022; Tai et al. 2021; Zelner et al. 2021.
- 375 US jails: Chappell 2021.
- 375 Richard Corsi: Wilke 2022.
- 376 “We have limited”: Allen and Corsi 2020.
- 377 a relief bill: Barnum 2022.
- 377 Adam Rogers: Rogers 2020; Rogers, personal communication.
- 377 Jim Rosenthal: Jim Rosenthal 2021.
- 378 the Corsi-Rosenthal box: Reyes 2022; Wolf 2022; Yorio 2022; Zimmer and Veiga 2020.
- 378 the true totals: Wang et al. 2022.

- 379 “I thought, this is insane”: Fauci 2024, p. 396.
- 379 Scott Atlas: Select Subcommittee on the Coronavirus Crisis 2022a.
- 379 20 or 25 percent of Americans: Tankersley et al. 2020.
- 379 “the most amazing”: Quoted in Budryk 2020.
- 379 “Nobody knows the system”: Trump 2016.
- 379 Michigan’s state capitol building: Mauger 2020.
- 379 require masks: Select Subcommittee on the Coronavirus Crisis 2022c.
- 379 According to Mark Meadows: Pengelly 2021.
- 379 party at the White House: USA Today Editorial Board 2020.
- 380 have trouble breathing: Weiland et al. 2021.
- 380 rushed him to Walter Reed Hospital: Liptak 2020.
- 380 five hundred people: Parker and Dawsey 2021.
- 380 “felt like fucking shit”: Quoted in Fauci, p. 403.
- 380 pulled off his mask: Liptak and Reston 2020.
- 380 “the now-famous”: Fauci 2020.
- 380 a virtual performance: Smith 2022.
- 381 “We don’t know yet”: SVC Vocal Course 2020.
- 381 a new variant: Sugden and Fidler 2020.
- 381 Donald Milton investigated Alpha: Adenaiye et al. 2022.
- 382 “Are you ready?”: Quoted in Sullivan 2020.
- 382 a top priority: Biden 2021.
- 382 Trump also got vaccinated: Haberman 2021.
- 382 the first 100 million doses: White House 2021b.
- 383 But critics worried: See, for example, Feldman 2022.
- 383 drafted a letter: Wood 2021.
- 383 “Calling the virus”: Marr 2021.
- 383 a child spread it: Goldberg et al. 2021.
- 383 “A rigid new standard”: American Hospital Association 2021.
- 384 Koch’s postulates: Jefferson et al. 2022.
- 384 “low quality”: Heneghan et al. 2021.
- 385 published paeans: Jimenez et al. 2021; Jimenez et al. 2022; Randall et al. 2021.
- 385 praised him in a feature: Megan Molteni’s 2021 award-winning article first brought the Wells to worldwide attention, exploring the five-micron confusion.
- 385 National Public Radio: On the Media 2021.
- 385 “If you are fully vaccinated”: Quoted in Cohen and Bonifield 2021.
- 386 “America is headed”: White House 2021a.
- 386 Provincetown: McKenna 2022a.
- 386 Walensky reversed: Lovelace 2021.
- 386 choruses in other countries: These studies include Charlotte 2020 and Reichert et al. 2022.
- 387 “We choose not”: Stone 2021.

- 387 “Current evidence suggests”: Lewis 2022.
 388 Donald Milton studied Omicron: Lai et al. 2023; Prillaman 2022.
 388 switch from surgical masks: World Health Organization 2021.
 388 “More deaths are taking place”: Thrasher 2022.

Chapter 18: A Mark on the Air

- 390 “SARS-CoV-2 is an airborne virus”: Lazarus et al. 2022. Among other subsequent reviews, Greenhalgh et al. 2024 concluded that masks can reduce the transmission of SARS-CoV-2.
 390 harshest lockdowns: Hessler 2020a; Hessler 2020b.
 391 Xi was boasting: Yang 2022a.
 391 Shanghai: Yang 2022b.
 391 his political doom: Chotiner 2022.
 391 “There’s been so many”: Quoted in Kang 2022.
 392 2.2 percent of people: Zhang et al. 2023.
 392 two million: Xiao et al. 2023.
 393 Inflation was the top response: Quinnipiac University Poll 2023.
 393 the *Economist* estimated: Our World in Data 2024.
 393 Measles: World Health Organization 2023a.
 393 a million people: World Health Organization 2019a.
 393 remained about as high: World Health Organization 2023c.
 394 even at close range: Klompas and Rhee 2022.
 394 a long list of diseases: Tang et al. 2022.
 394 can spread outdoors: See, for example, Linsey Marr’s 2022 Jacob Bjercknes Lecture at the American Geophysical Union: https://assets.agu.org/video/upload/v1670960825/aguorg-fm22/Tue_E354a_0900_164077_rpwceq.mp4.
 394 foot-and-mouth disease: See, for example, Björnham et al. 2020 and Casal 1995.
 395 Valley fever: Goodyear 2014; Head et al. 2022; Jackson et al. 2024; Mead et al. 2022.
 395 Other human pathogens: Behzad et al. 2018; Chen et al. 2020; Ma et al. 2017.
 395 “I had never experienced”: Kawasaki and Naoe 2014.
 395 Kawasaki Disease: Burney et al. 2021.
 396 inhale millions of organisms: Prussin et al. 2015; Robinson and Breed 2023.
 397 thrive in our airways: Escapa et al. 2018; Hamm et al. 2020; Pérez-Cobas et al. 2023.
 397 *Pneumocystis jirovecii*: Cisse et al. 2024; Gigliotti et al. 2014; Salazar-Hamm et al. 2022.
 398 We are responsible: Archer and Ponting 2020.
 398 The agricultural revolution: Calvignac-Spencer et al. 2021; Davies-Barrett et al. 2020.
 398 Measles viruses: Dux et al. 2020.
 399 ancestors of *Mycobacterium tuberculosis*: Buzic and Giuffra 2020; Pepperell 2022.
 399 sub-Saharan Africa: Ngabonziza et al. 2020; Sabin et al. 2020.
 399 fed on the amoebae: Hagedorn et al. 2009; Saelens et al. 2022.
 399 Tuberculosis spread easily: Brynildsrud et al. 2018.

400 a billion cows: Ritchie, Rosado, and Roser 2019.
400 more dust: Griffin et al. 2002.
400 doubled the emission of dust: Hooper and Marx 2018; United Nations Environment Programme 2016.
400 the rise in certain diseases: Bauer and Schwartz 2023.
400 to the clouds: Rossi et al. 2023.
400 700,000 people: Gao et al. 2023.
400 chickens and other livestock grow bigger: Kirchhelle 2018.
401 David Graham: Knapp et al. 2010.
401 looked for them in the air: Gao et al. 2023; George et al. 2022; Jiang et al. 2022; Kormos et al. 2022; Wu et al. 2022.
401 thirty different kinds of resistance genes: Li et al. 2018.
402 Rusts had been growing: Aime et al. 2018; Duplessis et al. 2021.
402 Bible-era farmers: Kelm and Mazar 1983; Kislev 1982.
403 the Green Revolution: Harwood 2018; Hurt 2020.
403 Ug99: Fetch et al. 2021; Hawkins 2021.
403 “Nobody’s seen an epidemic”: Quoted in Lacey 2005.
403 other resistant rusts: Bhardwaj et al. 2022; Saunders et al. 2019.
403 TKTF: Prank et al. 2019.
403 spread these rusts farther: Meyer et al. 2017.
403 we would be better off: Aime, personal communication; Kettles and Luna 2019; Lidwell-Durnin and Laphorn 2020.
405 inhaling denser clouds: Robinson et al. 2021.
405 a blacktop-covered city: Franchitti et al. 2022; Stewart and Kremer 2021.
405 Martin Breed: Liddicoat et al. 2020.
405 an atmospheric garden: Sun et al. 2023.
406 the Probiotic City: Robinson et al. 2024. See also Robinson and Breed 2024; Matthews et al. 2024.

Epilogue: Happy Birthday, Chita Rivera

407 Club Café: Kearnan 2013; Lopata 2013.
409 “This is not a sprint”: Quoted in Jarmanning and Brown 2020.
409 “Should not air disinfection”: Nardell and Nathavitharana 2020.
409 Over half of the hamsters: Ueckermann et al. 2023.
410 remained widely distanced: Club Café 2020.
410 far-UVC: Bender 2022; Blatchley et al. 2023; Welch et al. 2018.
412 479 millijoules: International Ultraviolet Association 2021.
412 registered only fifty-three: Nardell et al. 2023.
413 not having much success: Lewis 2023; Mark-Carew et al. 2023; Morawska et al. 2024; White House 2022.

BIBLIOGRAPHY

Abdelfatah, Rund, and Ramtin Arablouei. 2020. “How One Woman Inspired the Design for the N95 Mask.” *National Public Radio*, May 21, 2020.
<https://www.npr.org/2020/05/21/859991324/how-one-woman-inspired-the-design-for-the-n95-mask>.

Aberth, John. 2011. *Plagues in World History*. Lanham, MD: Rowman & Littlefield.

Abraham, Thomas. 2005. *Twenty-First Century Plague: The Story of SARS*. Baltimore, MD: Johns Hopkins University Press.

Ackerknecht, Erwin H. 2009. “Anticontagionism Between 1821 and 1867.” *Int J Epidemiol* 38(1):7-21. doi:10.1093/ije/dyn254.

Adams, Michael P., Nina S. Atanasova, Svetlana Sofieva, et al. 2021. “Ice Nucleation by Viruses and Their Potential for Cloud Glaciation.” *Biogeosciences* 18(14):4431-44. doi:10.5194/bg-18-4431-2021.

Adenaiye, Oluwasanmi O., Jianyu Lai, P. J. B. de Mesquita, et al. 2022. “Infectious Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in Exhaled Aerosols and Efficacy of Masks During Early Mild Infection.” *Clin Infect Dis* 75(1):e241-8. doi:10.1093/cid/ciab797.

Adler, Antony, and Erik Dücker. 2018. “When Pasteurian Science Went to Sea: The Birth of Marine Microbiology.” *J Hist Biol* 51(1):107-33. doi:10.1007/s10739-017-9477-8.

Aiello, Allison E., Rebecca M. Coulborn, Tomas J. Aragon, et al. 2010. “Research Findings from Nonpharmaceutical Intervention Studies for Pandemic Influenza and Current Gaps in the Research.” *Am J Infect Control* 38(4):251-8. doi:10.1016/j.ajic.2009.12.007.

Aime, Mary C., Charles D. Bell, and Andrew W. Wilson. 2018. “Deconstructing the Evolutionary Complexity Between Rust Fungi (Pucciniales) and Their Plant Hosts.” *Stud Mycol* 89:143-52. doi:10.1016/j.simyco.2018.02.002.

Alibek, Ken. 1999. “Biological Weapons in the Former Soviet Union: An Interview with Dr. Kenneth Alibek.” *Nonproliferation Rev* 6(3):1-10. doi:10.1080/10736709908436760.

— and Stephen Handelman. 1999. *Biohazard*. New York, NY: Random House.

Allain, Rhett. 2022. “The Physics of the N95 Face Mask.” *Wired*, January 28, 2022.
<https://www.wired.com/story/the-physics-of-the-n95-face-mask>.

Allen, Joseph G., and Richard Corsi. 2020. “We Can—and Must—Reopen Schools. Here’s How.” *Washington Post*, July 27, 2020.

Alltucker, Ken. 2020. “‘Can’t Expect Nurses to Be Miracle Workers’: Mask, Equipment Shortages Push Nurses to Brink Across Nation.” *USA Today*, April 11, 2020.

Alsante, Alyssa N., Daniel C. O. Thornton, and Sarah D. Brooks. 2021. “Ocean Aerobiology.” *Front Microbiol* 12:764178. doi:10.3389/fmicb.2021.764178.

Altman, Lawrence K. 1977. "Disease Expert Sees Threat of Germ War." *New York Times*, March 21, 1977.

—. 2003a. "The SARS Epidemic: The Virus; Health Group Certain of Agent in Respiratory Ailment." *New York Times*, April 17, 2003.

—. 2003b. "The Doctor's World; Behind the Mask, the Fear of SARS." *New York Times*, June 24, 2003.

—. 2003c. "U.S. Finds Different Villain in Search for Ailment's Cause." *New York Times*, March 25, 2003.

— and Keith Bradsher. 2003. "Rare Health Alert Is Issued by W.H.O. for Mystery Illness." *New York Times*, March 16, 2003.

— and Mark Landler. 2003. "W.H.O. Reports Gains Against Respiratory Outbreak." *New York Times*, March 20, 2003.

Amato, Pierre, Frederic Mathonat, Leslie N. Lopez, et al. 2023. "The Aeromicrobiome: The Selective and Dynamic Outer-Layer of the Earth's Microbiome." *Front Microbiol* 14:1186847. doi:10.3389/fmicb.2023.1186847.

—, Matthieu Ménager, Martine Sancelme, et al. 2005. "Microbial Population in Cloud Water at the Puy de Dôme: Implications for the Chemistry of Clouds." *Atmos Environ* 39(22):4143-53. doi:10.1016/j.atmosenv.2005.04.002.

—, Muriel Joly, Ludovic Besaury, et al. 2017. "Active Microorganisms Thrive Among Extremely Diverse Communities in Cloud Water." *PLoS One* 12(8):e0182869. doi:10.1371/journal.pone.0182869.

American Hospital Association. 2021. "Statement of the American Hospital Association for the Workforce Protections Subcommittee of the Committee on Education and Labor of the U.S. House of Representatives." March 11, 2021. <https://www.aha.org/testimony/2021-03-11-aha-statement-clearing-air-science-based-strategies-protect-workers-covid-19>.

Apel, Thomas A. 2016. *Feverish Bodies, Enlightened Minds*. Stanford, CA: Stanford University Press.

Archer, Stephen D. J., and Stephen B. Pointing. 2020. "Anthropogenic Impact on the Atmospheric Microbiome." *Nat Microbiol* 5(2):229-31. doi:10.1038/s41564-019-0650-z.

—, Kevin C. Lee, Tancredi Caruso, et al. 2019. "Airborne Microbial Transport Limitation to Isolated Antarctic Soil Habitats." *Nat Microbiol* 4(6):925-32. doi:10.1038/s41564-019-0370-4.

—, Kevin C. Lee, Tancredi Caruso, et al. 2023. "Contribution of Soil Bacteria to the Atmosphere Across Biomes." *Sci Total Environ* 871:162137. doi:10.1016/j.scitotenv.2023.162137.

Ariatti, Annalisa, and Paul Comtois. 1993. "Louis Pasteur: The First Experimental Aerobiologist." *Aerobiologia* 9(1):5-14. doi:10.1007/BF02311365.

Aristotle. 1908. "De Respiratione." In *The Works of Aristotle, Volume III: Meteorologica*. Edited by John A. Smith and William D. Ross. Oxford: Clarendon Press.

Arrizabalaga, Jon. 1994. "Facing the Black Death: Perceptions and Reactions of University Medical Practitioners." In *Practical Medicine from Salerno to the Black Death*, p. 259-64. Edited by Luis García-Ballester, Roger French, Jon Arrizabalaga, et al. Cambridge: Cambridge University Press.

Athenaeus. 2010. *The Learned Banqueters*. Edited and translated by S. D. Olson. Cambridge, MA: Harvard University Press.

Baehr, Peter. 2008. "City Under Siege: Authoritarian Toleration, Mask Culture, and the SARS Crisis in Hong Kong." In *Networked Disease: Emerging Infections in the Global City*. Edited by S. H. Ali and Roger Keil. Oxford: Wiley-Blackwell.

Baker, Nicholson. 2020. *Baseless: My Search for Secrets in the Ruins of the Freedom of Information Act*. New York, NY: Penguin Press.

Baldwin, Peter. 1999. *Contagion and the State in Europe, 1830-1930*. Cambridge: Cambridge University Press.

Ballhaus, Rebecca, and Stephanie Armour. 2020. "Health Chief's Early Missteps Set Back Coronavirus Response." *Wall Street Journal*, April 22, 2020.

Baray, Jean-Luc, Laurent Deguillaume, Aurélie Colomb, et al. 2020. "Cézeaux-Aulnat-Opme-Puy de Dôme: A Multi-Site for the Long-Term Survey of the Tropospheric Composition and Climate Change." *Atmos Meas Tech* 13(6):3413-45. doi:10.5194/amt-13-3413-2020.

Barber, Marshall A., and Oscar Teague. 1912. "Studies on Pneumonic Plague and Plague Immunization, XII." In *Some Experiments to Determine the Efficacy of Various Masks for Protection Against Pneumonic Plague*. Manila: Philippine Bureau of Printing.

Barenblatt, Daniel. 2004. *A Plague Upon Humanity: The Secret Genocide of Axis Japan's Germ Warfare Operation*. New York, NY: HarperCollins.

Barnum, Matt. 2022. "Schools Got \$190 Billion in COVID Relief from the Feds. What's Happened to It?" *Chalkbeat*, February 3, 2022. <https://www.chalkbeat.org/2022/2/3/22916590/schools-federal-covid-relief-stimulus-spending-tracking>.

Barrett, Ronald. 2006. "Dark Winter and the Spring of 1972: Deflecting the Social Lessons of Smallpox." *Med Anthropol* 25(2):171-91. doi:10.1080/01459740600686633.

Bassett, Mary T. 2022. "Undoing the Racial Patterning of Health." *2022 Alexander D. Langmuir Lecture*, May 4, 2022. <https://www.cdc.gov/eis/conference/langmuir-lecture.html>.

Bauer, Tonya, and Gadi Schwartz. 2023. "Valley Fever, Historically Found Only in the Southwest, Is Spreading. It Can Have Devastating Consequences." *NBC News*, January 30, 2023. <https://www.nbcnews.com/health/health-news/valley-fever-historically-found-only-southwest-spreading-can-devastati-rcna64313>.

Beedham, Richard J., and Carwyn H. Davies. 2020. "The UK Biological-Warfare Program: Dual-Use Contributions to the Field of Aerobiology." *Nonproliferation Rev* 27(4-6):309-22. doi:10.1080/10736700.2020.1823621.

- Behzad, Hayedeh, Katsuhiko Mineta, and Takashi Gojobori. 2018. "Global Ramifications of Dust and Sandstorm Microbiota." *Genome Biol Evol* 10(8):1970-87. doi:10.1093/gbe/evy134.
- Bell, John H. 1880. "On 'Woolsorter's Disease.'" *Lancet* 115(2962):871-3. doi:10.1016/S0140-6736(02)31601-5.
- . 1902. "Anthrax: Its Relation to the Wool Industry." In *Dangerous Trades: The Historical, Social, and Legal Aspects of Industrial Occupations as Affecting Health, by a Number of Experts*. Edited by Thomas Oliver. New York, NY: E. P. Dutton.
- Belvedere, Matthew J. 2020. "Trump Says He Trusts China's Xi on Coronavirus and the US Has it 'Totally Under Control'." *CNBC*, January 22, 2020. <https://www.cnbc.com/2020/01/22/trump-on-coronavirus-from-china-we-have-it-totally-under-control.html>.
- Bencko, Vladimír. 2018. "200th Anniversary of the Birth of Max von Pettenkofer (1818-1901), the Founder of Our Medical Discipline—Hygiene." *Cent Eur J Public Health* 26(4):326-7. doi:10.21101/cejph.a5671.
- Bender, Eric. 2022. "Safety is in the Air." *Nature* 610(7933):S46-7. doi:10.1038/d41586-022-03360-w.
- Bennett, Merrill K. 1939. "Wheat and War, 1914-18 and Now." *Wheat Studies* 16(3):67-114. doi:10.22004/ag.econ.142679.
- Beraldi-Campesi, Hugo. 2013. "Early Life on Land and the First Terrestrial Ecosystems." *Ecol Process* 2(1). doi:10.1186/2192-1709-2-1.
- Berbee, Mary L., Christine Strullu-Derrien, Pierre-Marc Delaux, et al. 2020. "Genomic and Fossil Windows into the Secret Lives of the Most Ancient Fungi." *Nat Rev Microbiol* 18(12):717-30. doi:10.1038/s41579-020-0426-8.
- Beretta, Marco. 2003. "The Revival of Lucretian Atomism and Contagious Diseases During the Renaissance." *Med Secoli* 15(2):129-54.
- Berg, Andrew S. 1998. *Lindbergh*. New York, NY: G. P. Putnam's Sons.
- Berkeley, Miles J. 1846. "Observations, Botanical and Physiological, on the Potato Murrain." *J Hort Soc* 1:9-35.
- . 1857. *Introduction to Cryptogamic Botany*. London: H. Bailliere.
- Bernstein, Barton J. 1987. "The Birth of the U.S. Biological-Warfare Program." *Sci Am* 256(6):116-21. <https://www.jstor.org/stable/24979407>.
- . 1988. "America's Biological Warfare Program in the Second World War." *J Strateg Stud* 11(3):292-317. doi:10.1080/01402398808437344.
- Bhardwaj, Subhash C., Om P. Gangwar, Pramod Prasad, et al. 2022. "Wheat Rust Research-Shifting Paradigms Globally." In *New Horizons in Wheat and Barley Research: Crop Protection and Resource Management*. Edited by Prem L. Kashyap, Vikas Gupta, Om P. Gupta, et al. Singapore: Springer.

- Biden Jr., Joseph R. 2021. "National Strategy for the COVID-19 Response and Pandemic Preparedness." *White House*, January 21, 2021. <https://www.whitehouse.gov/wp-content/uploads/2021/01/National-Strategy-for-the-COVID-19-Response-and-Pandemic-Preparedness.pdf>.
- Bigg, Edward, Burgess H. Jennings, and F. C. W. Olson. 1945. "Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization." *Am J Public Health Nations Health* 35(8):788-98. doi:10.2105/ajph.35.8.788.
- Bipartisan Commission on Biodefense. 2024. *The National Biodefense Blueprint*. <https://biodefensecommission.org/reports/the-national-blueprint-for-biodefense>.
- Birx, Deborah. 2022. *Silent Invasion: The Untold Story of the Trump Administration, Covid-19, and Preventing the Next Pandemic Before It's Too Late*. New York, NY: Harper.
- Björnham, Oscar, Robert Sigg, and Jan Burman. 2020. "Multilevel Model for Airborne Transmission of Foot-and-Mouth Disease Applied to Swedish Livestock." *PLoS One* 15(5):e0232489. doi:10.1371/journal.pone.0232489.
- Blackfan, Kenneth D., Constantin P. Yaglou, and Katherine M. Wyman. 1933. "The Premature Infant: A Study of the Effects of Atmospheric Conditions on Growth and on Development." *Am J Dis Child* 46(5 Pt 2):1175-236. doi:10.1001/archpedi.1933.01960060001001.
- Blackley, Charles H. 1873. *Experimental Researches on the Causes and Nature of Catarrhus Æstivus*. London: Baillière, Tindall & Cox.
- Blackwell, Tom. 2021. "'It's Very Volatile': How a Scientific Debate Over COVID Spread Turned into an Online War." *National Post*, May 13, 2021. <https://nationalpost.com/health/airborne-vs-droplets-how-a-scientific-debate-over-covid-spread-turned-into-an-online-war>.
- Blake, John B. 1948. "The Origins of Public Health in the United States." *Am J Public Health Nations Health* 38(11):1539-50. doi:10.2105/ajph.38.11.1539.
- Blatchley, Ernest R., David J. Brenner, Holger Claus, et al. 2023. "Far UV-C Radiation: An Emerging Tool for Pandemic Control." *Crit Rev Environ Sci Technol* 53(6):733-53. doi:10.1080/10643389.2022.2084315.
- Blažina-Tomić, Zlata, and Vesna Blažina. 2015. *Expelling the Plague: The Health Office and the Implementation of Quarantine in Dubrovnik, 1377-1533*. Montreal: McGill-Queen's University Press.
- Blevins, Steve M., and Michael S. Bronze. 2010. "Robert Koch and the 'Golden Age' of Bacteriology." *Int J Infect Dis* 14(9):e744-51. doi:10.1016/j.ijid.2009.12.003.
- Block, Steven M. 2001. "The Growing Threat of Biological Weapons." *Am Sci* 89:28-37.
- Boghardt, Thomas. 2009. "Soviet Bloc Intelligence and Its AIDS Disinformation Campaign." *Stud Intell* 53(4):1-24.

Borio, Luciana, Thomas Inglesby, C. J. Peters, et al. 2002. "Hemorrhagic Fever Viruses as Biological Weapons: Medical and Public Health Management." *JAMA* 287(18):2391-405. doi:10.1001/jama.287.18.2391.

Borland, H. G. 1922. "The Rescue of Oysters." *New York Tribune*, July 9, 1922.

Boulos, Leah, Janet A. Curran, Allyson Gallant, et al. 2023. "Effectiveness of Face Masks for Reducing Transmission of SARS-CoV-2: A Rapid Systematic Review." *Philos Trans A Math Phys Eng Sci* 381(2257):20230133. doi:10.1098/rsta.2023.0133.

Bourouiba, Lydia. 2008. "Numerical and Theoretical Study of Homogeneous Rotating Turbulence." Dissertation, McGill University.

—. 2018. "How Diseases and Epidemics Move Through a Breath of Air." *TEDMED*. <https://www.tedmed.com/talks/show?id=730067>.

—. 2020. "Turbulent Gas Clouds and Respiratory Pathogen Emissions: Potential Implications for Reducing Transmission of COVID-19." *JAMA* 323(18):1837-8. doi:10.1001/jama.2020.4756.

—. 2021a. "Fluid Dynamics of Respiratory Infectious Diseases." *Annu Rev Biomed Eng* 23:547-77. doi:10.1146/annurev-bioeng-111820-025044.

—. 2021b. "The Fluid Dynamics of Disease Transmission." *Annu Rev Fluid Mech* 53:473-508. doi:10.1146/annurev-fluid-060220-113712.

—, A. Teslya, and Jianhong Wu. 2011. "Highly Pathogenic Avian Influenza Outbreak Mitigated By Seasonal Low Pathogenic Strains: Insights From Dynamic Modeling." *J Theor Biol* 271(1):181-201. doi:10.1016/j.jtbi.2010.11.013.

—, Eline Dehandschoewercker, and John W. M. Bush. 2014. "Violent Expiratory Events: On Coughing and Sneezing." *J Fluid Mech* 745:537-63. doi:10.1017/jfm.2014.88.

Bowman, John L. 2022. "The Origin of a Land Flora." *Nat Plants* 8(12):1352-69. doi:10.1038/s41477-022-01283-y.

Boxall, Bettina. 2013. "From Sahara Dust to Sierra Snow." *Los Angeles Times*, March 1, 2013.

Bradley, Richard. 1721. *The Plague at Marseilles Consider'd*. London: W. Mears.

Bradsher, Keith. 2003. "A Deadly Virus on Its Mind, Hong Kong Covers Its Face." *New York Times*, March 31, 2003.

—. 2009. "Quick Action by Hong Kong Reflects Experience of SARS." *New York Times*, May 1, 2009.

Brankston, Gabrielle, Leah Gitterman, Zahir Hirji, et al. 2007. "Transmission of Influenza A in Human Beings." *Lancet Infect Dis* 7(4):257-65. doi:10.1016/S1473-3099(07)70029-4.

Branswell, Helen. 2009. "Bringing Pandemic Vaccine to Flu Clinics Requires Testing." *Fort McMurray Today*, p. 44.

Braut-Hegghammer, Målfrid. 2020. "Cheater's Dilemma: Iraq, Weapons of Mass Destruction, and the Path to War." *Int Sec* 45(1):51-89.

Breitbart, Mya, and Forest Rohwer. 2005. "Here a Virus, There a Virus, Everywhere the Same Virus?" *Trends Microbiol* 13(6):278-84. doi:10.1016/j.tim.2005.04.003.

Brickner, Philip W., and Richard L. Vincent. 2013. "Ultraviolet Germicidal Irradiation Safety Concerns: A Lesson from the Tuberculosis Ultraviolet Shelter Study: Murphy's Law Affirmed." *Photochem Photobiol* 89(4):819-21. doi:10.1111/php.12034.

Bright, Rick. 2020a. "Complaint of Prohibited Personnel Practice or Other Prohibited Activity (OMB No. 3255-0005)." *U.S. Office of Special Counsel*.
https://web.archive.org/web/20221231033404/https://katzbanks.com/sites/default/files/NEW%20R.%20Bright%20OSC%20Complaint_Redacted.pdf.

—. 2020b. "Scientific Integrity in the COVID-19 Response." *Library of Congress*, May 14, 2020. <https://www.congress.gov/116/meeting/house/110749/witnesses/HHRG-116-IF14-Wstate-BrightR-20200514.pdf>.

British Pathé. 1934. "Lindy and Ann Home Again." <https://www.britishpathe.com/asset/40553/>.

Brock, Thomas D. 1999. *Robert Koch: A Life in Medicine and Bacteriology*. Washington, DC: ASM Press.

Brodsky, Alyn. 2004. *Benjamin Rush: Patriot and Physician*. New York, NY: Truman Talley Books.

Brody, Leslie. 2021. "Covid-19's 'Patient Zero' in New York: What Life Is Like for the New Rochelle Lawyer." *Wall Street Journal*, March 5, 2021.

Brookfield, Michael E., Elizabeth J. Catlos, and Stephanie E. Suarez. 2022. "Vertebrate Lies? Arthropods Were the First Land Animals!" *Geol Today* 38(2):65-8. doi:10.1111/gto.12383.

Brower, Roy G., and J. T. Sylvester. 2012. "Solbert Permutt, M.D." *Am J Respir Crit Care Med* 186(2):115. doi:10.1164/rccm.201206-1034le.

Brown, James K. M., and Mogens S. Hovmøller. 2002. "Aerial Dispersal of Pathogens on the Global and Continental Scales and Its Impact on Plant Disease." *Science* 297(5581):537-41. doi:10.1126/science.1072678.

Brown, Michael. 2008. "From Foetid Air to Filth: The Cultural Transformation of British Epidemiological Thought, ca. 1780-1848." *Bull Hist Med* 82(3):515-44. doi:10.1353/bhm.0.0070.

Brynildsrud, Ola B., Caitlin S. Pepperell, Philip Suffys, et al. 2018. "Global Expansion of *Mycobacterium tuberculosis* Lineage 4 Shaped by Colonial Migration and Local Adaptation." *Sci Adv* 4(10):eaat5869. doi:10.1126/sciadv.aat5869.

Buchbinder, Leon, Mathilde Solowey, and Morris Solotorovsky. 1938. "Alpha Hemolytic Streptococci of Air: Their Variant Forms, Origin and Numbers Per Cubic Foot of Air in Several Types of Locations." *Am J Public Health Nations Health* 28(1):61-71. doi:10.2105/ajph.28.1.61.

Buckland, Stephen. 2022. "The Newgate Prison Windmill." *Mills Archive*, November 14, 2022. <https://new.millsarchive.org/2022/11/14/the-newgate-prison-windmill>.

Buckley, Chris, Sui-Lee Wee, and Amy Qin. 2020. "China's Doctors, Fighting the Coronavirus, Beg for Masks." *New York Times*, February 14, 2020.

Budryk, Zach. 2020. "Infectious Disease Expert Calls White House Advisers Herd Immunity Claims 'Pseudoscience'." *The Hill*, October 18, 2020. <https://thehill.com/homenews/sunday-talk-shows/521605-infectious-disease-expert-calls-white-house-advisers-herd-immunity>.

Bueno-Sancho, Vanessa, Elizabeth S. Orton, Morgan Gerrity, et al. 2021. "Aeciospore Ejection in the Rust Pathogen *Puccinia graminis* Is Driven by Moisture Ingress." *Commun Biol* 4(1):1216. doi:10.1038/s42003-021-02747-1.

Bump, Philip. 2018. "15 Years After the Iraq War Began, the Death Toll Is Still Murky." *Washington Post*, March 20, 2018.

—. 2020. "What Trump Did about Coronavirus in February." *Washington Post*, April 20, 2020.

Burgess, Adam, and Mitsutoshi Horii. 2012. "Risk, Ritual and Health Responsibilisation: Japan's 'Safety Blanket' of Surgical Face Mask-Wearing." *Sociol Health Illn* 34(8):1184-98. doi:10.1111/j.1467-9566.2012.01466.x.

Burney, Jennifer A., Laurel L. DeHaan, Chisato Shimizu, et al. 2021. "Temporal Clustering of Kawasaki Disease Cases Around the World." *Sci Rep* 11(1):22584. doi:10.1038/s41598-021-01961-5.

Bush, George W. 2003. "Remarks on Project BioShield in Bethesda, Maryland." In *Public Papers of the Presidents of the United States: George W. Bush, 2003*. USGPO.

—. 2005. "President Outlines Pandemic Influenza Preparations and Response." *White House*, November 1, 2005. <https://georgewbush-whitehouse.archives.gov/news/releases/2005/11/print/20051101-1.html>.

—. 2010 *Decision Points*. New York, NY: Crown Publishers.

Butler, Loren J. 1994. "Robert S. Mulliken and the Politics of Science and Scientists, 1939-1946." *Hist Stud Phys Biol Sci* 25(1):25-45. doi:10.2307/27757734.

Buzic, Ileana, and Valentina Giuffra. 2020. "The Paleopathological Evidence on the Origins of Human Tuberculosis: A Review." *J Prev Med Hyg* 61(1 Suppl 1):E3-8. doi:10.15167/2421-4248/jpmh2020.61.1s1.1379.

Byerly, Carol R. 2010. "The U.S. Military and the Influenza Pandemic of 1918-1919." *Public Health Rep* 125 (Suppl 3): 81-91. doi:10.1177/00333549101250S311.

Callaghan, Corey T., Shinichi Nakagawa, and William K. Cornwell. 2021. "Global Abundance Estimates for 9,700 Bird Species." *Proc Natl Acad Sci U S A* 118(21):e2023170118. doi:10.1073/pnas.2023170118.

Calvignac-Spencer, Sébastien, Ariane Düx, Jan F. Gogarten, et al. 2021. "A Great Ape Perspective on the Origins and Evolution of Human Viruses." *Adv Virus Res* 110:1-26. doi:10.1016/bs.aivir.2021.06.001.

Campbell, Archie G. 2006. "Spring of Fear." *SARS Commission*, December 2006. https://www.archives.gov.on.ca/en/e_records/sars/report/index.html.

- Capps, Joseph A. 1918a. "A New Adaptation of the Face Mask in Control of Contagious Disease." *JAMA* 70(13):910-1. doi:10.1001/jama.1918.26010130001009.
- . 1918b. "Measures for the Prevention and Control of Respiratory Infections in Military Camps." *JAMA* 71(6):448-51. doi:10.1001/jama.1918.26020320008010a.
- Cara, Ed. 2019. "We're Not Ready for the Next Pandemic." *Gizmodo*, October 18, 2019. <https://gizmodo.com/were-not-ready-for-the-next-pandemic-1839169413>.
- Carter, K. C. 1985. "Koch's Postulates in Relation to the Work of Jacob Henle and Edwin Klebs." *Med Hist* 29(4):353-74. doi:10.1017/s0025727300044689.
- Carter, Luther J., and Bryce Nelson. 1968. "Arms Control: Demand for Decisions." *Science* 162(3858):1102-8.
- Carus, W. S. 2015. "The History of Biological Weapons Use: What We Know and What We Don't." *Health Secur* 13(4):219-55. doi:10.1089/hs.2014.0092.
- . 2017. *A Short History of Biological Warfare: From Pre-History to the 21st Century*. Washington, DC: National Defense University Press.
- . 2020. "Perspectives on 'Bioterrorism' in the Nineteenth Century: The Philosophy of Mass Destruction, Fake News, and Other Fictions." *Nonproliferation Rev* 27(4-6):267-75. doi:10.1080/10736700.2020.1843252.
- Casal, Joachim, Eulàlia Planas-Cuchí, José M. Moreso, et al. 1995. "Forecasting Virus Atmospheric Dispersion. Studies with Foot-and-Mouth Disease." *J Hazard Mater* 43(3):229-44. doi:10.1016/0304-3894(95)00040-2.
- Cassedy, James H. 1962. *Charles V. Chapin and the Public Health Movement*. Cambridge, MA: Harvard University Press.
- Cauvel, Kimberly. 2020. "Locals Speak Out About Symptoms, Seriousness of Coping with COVID-19." *Skagit Valley Herald*, April 2, 2020. https://www.goskagit.com/news/local_news/locals-speak-out-about-symptoms-seriousness-of-coping-with-covid-19/article_054cc9f1-6e53-5967-b43d-82bc49c21c79.html.
- Cavaillon, Jean-Marc, and Sandra Legout. 2022. "Louis Pasteur: Between Myth and Reality." *Biomolecules* 12(4):596. doi:10.3390/biom12040596.
- Centers for Disease Control and Prevention. 1985. "Drug-Resistant Tuberculosis Among the Homeless—Boston." *Morb Mortal Wkly Rep* 34(28):429-31.
- . 1994. "Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health-Care Facilities." *Morb Mortal Wkly Rep* 43(RR13):1-132.
- . 2007. "Interim Pre-Pandemic Planning Guidance: Community Strategy for Pandemic Influenza Mitigation in the United States." February 2007. <https://stacks.cdc.gov/view/cdc/11425>.
- . 2009a. "Swine Influenza A (H1N1) Infection in Two Children—Southern California, March-April 2009." *Morb Mortal Wkly Rep* 58(15):400-2.

- . 2009b. “Outbreak of Swine-Origin Influenza A (H1N1) Virus Infection—Mexico, March-April 2009.” *Morb Mortal Wkly Rep* 58(17):467-70.
- . 2009c. “Press Briefing Transcripts: CDC Briefing on Public Health Investigation of Human Cases of Swine Influenza.” April 23, 2009.
<https://www.cdc.gov/media/transcripts/2009/t090423.htm>.
- . 2010a. “Interim Guidance on Infection Control Measures for 2009 H1N1 Influenza in Healthcare Settings, Including Protection of Healthcare Personnel.” July 15, 2010.
https://www.cdc.gov/h1n1flu/guidelines_infection_control.htm.
- . 2010b. “The 2009 H1N1 Pandemic: Summary Highlights, April 2009-April 2010.” June 16, 2010. <https://www.cdc.gov/h1n1flu/cdcresponse.htm>.
- . 2016. “Why Ebola Is Not Likely to Become Airborne.” January 12, 2016.
<https://stacks.cdc.gov/view/cdc/37690>.
- . 2020a. “Use of Cloth Face Coverings to Help Slow the Spread of COVID-19.” April 3, 2020.
<https://web.archive.org/web/20200405000751/https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html>.
- . 2020b. “Interim US Guidance for Risk Assessment and Public Health Management of Persons with Potential Coronavirus Disease 2019 (COVID-19) Exposures: Geographic Risk and Contacts of Laboratory-confirmed Cases.” March 7, 2020.
<https://web.archive.org/web/20200313005127/https://www.cdc.gov/coronavirus/2019-ncov/php/risk-assessment.html>.
- . 2020c. “How COVID-19 Spreads.” March 4, 2020.
<https://web.archive.org/web/20200308004135/https://www.cdc.gov/coronavirus/2019-ncov/about/transmission.html>.
- . 2023. “History of Ebola Outbreaks.” August 30, 2023.
<https://www.cdc.gov/vhf/ebola/history/chronology.html>.
- Cerullo, Megan. 2020. “Face Mask Prices Surge as Coronavirus Fears Grow.” *CBS News*, February 27, 2020. <https://www.cbsnews.com/news/amazon-coronavirus-face-mask-price-gouging-shortages>.
- Chagla, Zain, Susy Hota, Sarah Khan, et al. 2021. “Re: It Is Time to Address Airborne Transmission of COVID-19.” *Clin Infect Dis* 73(11):e3981-2. doi:10.1093/cid/ciaa1118.
- Chan, Sewell. 2009. “Swine Flu Upsets Rituals of Greeting.” *New York Times*, September 3, 2009.
- Chapin, Charles V. 1885. *The Present State of the Germ-Theory of Disease*. Providence, RI: Kellogg Printing.
- . 1908. “Air Infection of Minor Importance.” *JAMA* 51(24):2048-51. doi:10.1001/jama.1908.25410240036001k.
- . 1910. *The Sources and Modes of Infection*. New York, NY: John Wiley & Sons.

—. 1914. “The Air as a Vehicle of Infection.” *JAMA* 62(6):423-30. doi:10.1001/jama.1914.02560310001001.

—. 1919. “A Bad General.” *Am J Public Health* 9(10):784-5. doi:10.2105/ajph.9.10.784.

—. 1934. *Papers of Charles V. Chapin, M.D.: A Review of Public Health Realities*. New York, NY: Commonwealth Fund.

Chappell, Bill. 2021. “Crowded U.S. Jails Drove Millions of COVID-19 Cases, a New Study Says.” *National Public Radio*, September 2, 2021.

<https://www.npr.org/2021/09/02/1033326204/crowded-jails-drove-millions-of-covid-19-cases-a-new-study-says>.

Charlotte, Nathalie. 2023. “High Rate of SARS-CoV-2 Transmission Due to Choir Practice in France at the Beginning of the COVID-19 Pandemic.” *J Voice* 37(2):292.e9-14. doi:10.1016/j.jvoice.2020.11.029.

Chen, Pei-Shih, Feng T. Tsai, Chien K. Lin, et al. 2010. “Ambient Influenza and Avian Influenza Virus During Dust Storm Days and Background Days.” *Environ Health Perspect* 118(9):1211-6. doi:10.1289/ehp.0901782.

Cheng, Pan, Kaiwei Luo, Shenglan Xiao, et al. 2022. “Predominant Airborne Transmission and Insignificant Fomite Transmission of SARS-CoV-2 in a Two-Bus COVID-19 Outbreak Originating from the Same Pre-Symptomatic Index Case.” *J Hazard Mater* 425:128051. doi:10.1016/j.jhazmat.2021.128051.

Cheng, Vincent C., Shuk-Ching Wong, Albert K. Au, et al. 2022. “Explosive Outbreak of SARS-CoV-2 Omicron Variant Is Associated with Vertical Transmission in High-Rise Residential Buildings in Hong Kong.” *Build Environ* 221:109323. doi:10.1016/j.buildenv.2022.109323.

Cheung, Tony, and Alvin Lum. 2020. “Coronavirus: Desperate Scenes as 10,000 Queue for Masks at Hong Kong Industrial Estate.” *South China Morning Post*, February 5, 2020.

<https://www.scmp.com/news/hong-kong/health-environment/article/3049082/coronavirus-10000-queue-masks-hong-kong>.

Chisholm, Brock, Claude E. Dolman, Donald Kerr, et al. 1959. “Pugwash International Conference of Scientists: Statement on Biological and Chemical Warfare.” *Nature* 184:1018-20. doi:10.1038/1841018a0.

Chotiner, Isaac. 2022. “Why Xi Jinping Changed His Mind on ‘Zero Covid’.” *New Yorker*, December 9, 2022. <https://www.newyorker.com/news/q-and-a/why-xi-jinping-changed-his-mind-on-zero-covid>.

Chowder, Ken. 1992. “How TB Survived Its Own Death to Confront Us Again.” *Smithsonian* 23(8):180-94.

Christensen, Clyde M. 1992. *Elvin Charles Stakman, 1885-1979*. Washington, DC: National Academy of Sciences.

Christison, Robert. 1846. “Account of a Typhoid Fever, Apparently Originating in Local Miasma.” *Mon J Med Sci* 1(1):1-12.

Cissé, Ousmane H., Liang Ma, and Joseph A. Kovacs. 2024. “Retracing the Evolution of Pneumocystis Species, with a Focus on the Human Pathogen *Pneumocystis jirovecii*.” *Microbiol Mol Biol Rev* 88(2):e0020222. doi:10.1128/membr.00202-22.

Civil Aeronautics Authority. 1938. “Preliminary Report of Investigation of the Disappearance of an Aircraft of Pan American Airways, Incorporated, in the Vicinity of Latitude 12 27, North, Longitude 130 40, East, on July 29, 1938.” November 18, 1938. <https://rosap.ntl.bts.gov/view/dot/33006>.

Clinton, William J. 1999. *Public Papers of the Presidents of the United States: William J. Clinton, 1999, Book 1*. USGPO.

—. 2004. *My Life*. New York, NY: Knopf.

Club Café. 2020. “COVID-19 Handbook.” June 2020. <https://www.clubcafe.com/wp-content/uploads/2020/06/Club-Cafe-Corona-Handbookpdf>.

Cochran, Dolan. 2020. “A Long Battle Against Public Spitting: New York City’s 1896 Anti-Expectoration Law.” *Tenement Museum*, August 12, 2020. <https://www.tenement.org/blog/a-long-battle-against-public-spitting>.

Cochrane, Dorothy. 2021. “Tingmissartoq! Charles and Anne Lindbergh Tour Greenland.” *Smithsonian Institution*, March 22, 2021. <https://airandspace.si.edu/stories/editorial/tingmissartoq-charles-and-anne-lindbergh-tour-greenland>.

Cochrane, Rexmond C. 1947. *History of the Chemical Warfare Service in World War II: Biological Warfare Research in the United States*. Washington, DC: U.S. Office of Chief, Chemical Corps.

Cohen, Elizabeth, and John Bonifield. 2021. “People Vaccinated Against Covid-19 Can Go Without Masks Indoors and Outdoors, CDC Says.” *CNN*, May 13, 2021. <https://www.cnn.com/2021/05/13/health/cdc-mask-guidance-vaccinated/index.html>.

Cohn Jr., Samuel K. 2007. “The Black Death and the Burning of Jews.” *Past & Present* 196(1):3-36. doi:10.1093/pastj/gtm005.

Cole, Leonard A. 1988. *Clouds of Secrecy: The Army’s Germ Warfare Tests Over Populated Areas*. Totowa, NJ: Rowman & Littlefield.

Coleman, William. 1987. “Koch’s Comma Bacillus: The First Year.” *Bull Hist Med* 61(3):315-42. <https://www.jstor.org/stable/44442096>.

Coll, Steven. 2024. *The Achilles Trap: Saddam Hussein, The C.I.A., and the Origins of America’s Invasion of Iraq*. New York, NY: Penguin Press.

Columbia University Department of Microbiology and Immunology. n.d. “The Reclusive Revolutionary: Dr. Elvin Kabat and His Legacy.” <https://microbiology.columbia.edu/dr-elvin-kabat-and-his-legacy-the-reclusive-revolutionary-historical-faculty-highlight>.

Comtois, Paul. 1997. “Pierre Miquel: The First Professional Aerobiologist.” *Aerobiologia* 13(2):75-82. doi:10.1007/BF02694422.

- . 1999. “A Fifteen Years History at the Dawn of a New Millennium.” *Aerobiologia* 15(4):iii. doi:10.1023/A:1007644119021.
- and Scott Isard. 1999. “Aerobiology: Coming of Age in a New Millennium.” *Aerobiologia* 15(4): 259-66. doi:10.1023/A:1007606603553.
- Conly, John M. 2006. “Personal Protective Equipment for Preventing Respiratory Infections: What Have We Really Learned?” *CMAJ* 175(3):263-4. doi:10.1503/cmaj.060685.
- , Wing H. Seto, Didier Pittet, et al. 2020. “Use of Medical Face Masks Versus Particulate Respirators as a Component of Personal Protective Equipment for Health Care Workers in the Context of the COVID-19 Pandemic.” *Antimicrob Resist Infect Control* 9(1):126. doi:10.1186/s13756-020-00779-6.
- Connolly, Sean. 2022. “How Potato Blight Made Ireland into a Country of Emigrants.” *Literary Hub*, October 17, 2022. <https://lithub.com/how-potato-blight-made-ireland-into-a-country-of-emigrants>.
- Conrad, Lawrence I. 1982. “Tā’ūn and Wabā’ Conceptions of Plague and Pestilence in Early Islam.” *J Econ Soc Hist Orient* 25(3):268-307. doi:10.2307/3632188.
- Cortese, Marta, Katharina Siems, Stella Koch, et al. 2021. “MARSBOx: Fungal and Bacterial Endurance from a Balloon-Flown Analog Mission in the Stratosphere.” *Front Microbiol* 12. doi:10.3389/fmicb.2021.601713.
- Couch, Christina. 2015. “The Typhoid Buster.” *Technology Review*, December 22, 2015. <https://www.technologyreview.com/2015/12/22/164365/the-typhoid-buster>.
- Covid Crisis Group. 2023. *Lessons from the Covid War: An Investigative Report*. New York, NY: PublicAffairs.
- Cowling, Benjamin J., Kwok-Hung Chan, Vicky J. Fang, et al. 2009. “Facemasks and Hand Hygiene to Prevent Influenza Transmission in Households: A Cluster Randomized Trial.” *Ann Intern Med* 151(7):437-46. doi:10.7326/0003-4819-151-7-200910060-00142.
- , Rita O. P. Fung, Calvin K. Y. Cheng, et al. 2008. “Preliminary Findings of a Randomized Trial of Non-Pharmaceutical Interventions to Prevent Influenza Transmission in Households.” *PLoS One* 3(5):e2101. doi:10.1371/journal.pone.0002101.
- Cramer, Maria, and Knvul Sheikh. 2020. “Surgeon General Urges the Public to Stop Buying Face Masks.” *New York Times*, February 29, 2020.
- Crichton, Michael. 1969. *The Andromeda Strain*. New York, NY: Knopf.
- Crilly, Rob. 2018. “Is This the Face of Disease X? The Deadly Pathogens Which Could Cause the Next Global Pandemic.” *Telegraph*, May 14, 2018. <https://www.telegraph.co.uk/global-health/science-and-disease/face-disease-x-airborne-viruses-could-cause-next-global-pandemic>.
- Cristiani, Hector. 1893. “Analyse Bacteriologique de L’air des Hauteurs, Puise Pendant un Voyage en Ballon.” *Ann L’Inst Pasteur* 7(9):665-71.
- . 1895. “Effets de la Thyroïdectomie Chez les Serpents.” *Comptes Rendus Hebdomadaires* 47:22-3.

Crowe, Kelly. 2003. "The Mysteries of Testing, Treatment and Transmission." *CBC*, April 25, 2003. https://www.cbc.ca/news2/background/sars/crowe_mysteries.html.

Cruden, R. W. 2000. "Pollen Grains: Why So Many?" *Plant Syst Evol* 222:143-65. <http://www.jstor.org/stable/23644332>.

Cullison, Alan. 2004. "Inside Al-Qaeda's Hard Drive." *Atlantic*, September 2004. <https://www.theatlantic.com/magazine/archive/2004/09/inside-al-qaeda-s-hard-drive/303428>.

Culliton, Barbara J. 1990. "Emerging Viruses, Emerging Threat." *Science* 247(4940):279-80. doi:10.1126/science.215331.

Culver, Jordan. 2020. "6 Feet Enough for Social Distancing? MIT Researcher Says Droplets Carrying Coronavirus Can Travel Up to 27 Feet." *USA Today*, March 31, 2020.

Cumblor, John T. 2001. *Reasonable Use: The People, the Environment, and the State, New England, 1790-1930*. Oxford: Oxford University Press.

Cumming, Hugh S. 1916. *Investigation of the Pollution and Sanitary Conditions of the Potomac Watershed*. USGPO.

Cunningham, David D. 1873. *Microscopic Examinations of Air*. Calcutta: Superintendent of Government Printing.

Dafoe, Allan R. 1941. "Lax Measles Quarantines Imperil Many Children." *Philadelphia Inquirer*, April 7, 1941.

Dai, Yanjun, Krishnan Sumathy, Ruzhu Wang, et al. 2003. "Enhancement of Natural Ventilation in a Solar House with a Solar Chimney and a Solid Adsorption Cooling Cavity." *Solar Energy* 74(1):65-75. doi:10.1016/S0038-092X(03)00106-3.

Dalgard, Dan W., R. J. Hardy, Stephen L. Pearson, et al. 1992. "Combined Simian Hemorrhagic Fever and Ebola Virus Infection in Cynomolgus Monkeys." *Lab Anim Sci* 42(2):152-7.

Darwin, Charles. 1846. "An Account of the Fine Dust Which Often Falls on Vessels in the Atlantic Ocean." *Quart J Geol Soc London* 2:26-30. doi:10.1144/GSL.JGS.1846.002.01-02.09.

—. 1909. *The Voyage of the Beagle*. New York, NY: P. F. Collier & Son.

Davey, Marie L., Line Nybakken, Hävard Kausrud, et al. 2009. "Fungal Biomass Associated with the Phyllosphere of Bryophytes and Vascular Plants." *Mycol Res* 113(Pt 11):1254-60. doi:10.1016/j.mycres.2009.08.001.

Davidson, Elizabeth W. 2012. "History of Insect Pathology." In *Insect Pathology*. Edited by Fernando E. Vega and Harry K. Kaya. London: Academic Press.

Davies, Anna, Katy-Anne Thompson, Karthika Giri, et al. 2013. "Testing the Efficacy of Homemade Masks: Would They Protect in an Influenza Pandemic?" *Disaster Med Public Health Prep* 7(4):413-8. doi:10.1017/dmp.2013.43.

Davies-Barrett, Anna M., Daniel Antoine, and Charlotte A. Roberts. 2020. "Respiratory Disease in the Middle Nile Valley: The Impact of Environment and Aridification." In *The Routledge*

Handbook of the Bioarchaeology of Climate and Environmental Change, 122-140. Edited by Gwen R. Schug. London: Routledge.

Davis, Mike. 2005. *The Monster at Our Door: The Global Threat of Avian Flu*. New York, NY: New Press.

Debré, Patrice. 1998. *Louis Pasteur*. Baltimore, MD: Johns Hopkins University Press.

DeCesare, Catherine. n.d. "Pandemic Policy Parallels: Rhode Island Perspective." *University of Rhode Island*. <https://web.uri.edu/ssirep/pandemic-policy-parallels-rhode-island-perspective>.

Deicke, Luc. 2022. "Mass Transfer at the Ocean-Atmosphere Interface: The Role of Wave Breaking, Droplets and Bubbles." *Annu Rev Fluid Mech* 54:191-224. doi:10.1146/annurev-fluid-030121-014132.

Del Mundo, Fé D., and Charles F. McKhann. 1941. "Effect of Ultraviolet Irradiation of Air on Incidence of Infections in an Infants' Hospital." *Am J Dis Child* 61(2):213-25. doi:10.1001/archpedi.1941.02000080003001.

DeLacy, Margaret. 2017. *Contagionism Catches on: Medical Ideology in Britain, 1730-1800*. New York, NY: Palgrave Macmillan.

Delaware Federal Writers' Project. 1976. *Delaware: A Guide to the First State*. St. Clair Shores, MI: Scholarly Press.

Deniel, Catherine, Pierre Boivin, Didier Miallier, et al. 2020. "Multi-Stage Growth of the Trachytic Lava Dome of the Puy de Dôme (Chaîne Des Puys, France). Field, Geomorphological and Petro-Geochemical Evidence." *J Volcanol Geotherm Res* 396(2):106749. doi:10.1016/j.jvolgeores.2019.106749.

DeYoung, Karen. *Soldier: The Life of Colin Powell*. New York, NY: Knopf, 2006.

Diamond, Dan. 2020. "Inside America's 2-Decade Failure to Prepare for Coronavirus." *Politico*, April 11, 2020. <https://www.politico.com/news/magazine/2020/04/11/america-two-decade-failure-prepare-coronavirus-179574>.

— and Nahal Toosi. 2020. "Trump Team Failed to Follow NSC's Pandemic Playbook." *Politico*, March 25, 2020. <https://www.politico.com/news/2020/03/25/trump-coronavirus-national-security-council-149285>.

Dilanian, Ken, Dan de Luce, and Andrew W. Lehren. 2020. "From Clinton to Trump, 20 Years of Boom and Mostly Bust in Prepping for Pandemics." *NBC News*, April 13, 2020. <https://www.nbcnews.com/politics/national-security/clinton-trump-20-years-boom-mostly-bust-prepping-pandemics-n1182291>.

Doherty, Matthew. 2020. "Here's How Dr. Sanjay Gupta Says to Properly Disinfect Your Groceries." *Boston.com*, April 4, 2020. <https://www.boston.com/news/health/2020/04/04/heres-how-dr-sanjay-gupta-says-to-properly-disinfect-your-groceries>.

Dolan, John R. 2022. "The Lesser-Known Scientific Art of Christian Gottfried Ehrenberg." *Arts et Sciences* 6(3). doi:10.21494/ISTE.OP.2022.0879.

Dols, Michael W. 1977. *The Black Death in the Middle East*. Princeton, NJ: Princeton University Press.

Dommer, Abigail C., Nicholas A. Wauer, Kyle J. Angle, et al. 2023. “Revealing the Impacts of Chemical Complexity on Submicrometer Sea Spray Aerosol Morphology.” *ACS Cent Sci* 9(6):1088-103. doi:10.1021/acscentsci.3c00184.

Downes, Jean. 1950. “Control of Acute Respiratory Illness by Ultra-Violet Lights.” *Am J Public Health Nations Health* 40(12):1512-20. doi:10.2105/ajph.40.12.1512.

—. 1951. “The Control of Acute Respiratory Illness by Ultra-Violet Lights. Study No. 2.” *Milbank Memorial Fund Quarterly* 29(2):186-217. doi:10.2307/3348456.

—. 1952. “Change with Age in Susceptibility to Minor Respiratory Illness.” *Milbank Memorial Fund Quarterly* 30(3):211-23. doi:10.2307/3348263.

— and Jane C. Mertz. 1953. “Effect of Frequency of Family Visiting Upon the Reporting of Minor Illnesses.” *Milbank Memorial Fund Quarterly* 31(4):371-90. doi:10.2307/3348443.

Dressaire, Emilie, Lisa Yamada, Boya Song, et al. 2016. “Mushrooms Use Convectively Created Airflows to Disperse Their Spores.” *Proc Natl Acad Sci U S A* 113(11):2833-8. doi:10.1073/pnas.1509612113.

Drinker, Philip, and Theodore Hatch. 1936. *Industrial Dust, Hygienic Significance, Measurement, and Control*. New York, NY: McGraw-Hill.

— and William F. Wells. 1934. “A Method of Testing Filters Against Pollens, Bacteria and Molds.” *ASHRAE* 6:408-10.

Driscoll, Emily, and Luke Groskin. 2017. “Breakthrough: Connecting the Drops.” *Science Friday*, March 30, 2017. <https://www.sciencefriday.com/videos/breakthrough-connecting-the-drops>.

Duarte, Carlos M. 2015. “Seafaring in the 21st Century: The Malaspina 2010 Circumnavigation Expedition.” *Limnol Oceanogr Bull* 24(1):11-4. doi:10.1002/lob.10008.

Duckwitz, Theresa M., and Dominik Groß. 2021. “Searching for Motives: Suicides of Doctors and Dentists in the Third Reich and the Postwar Period, 1933-1949.” *Endeavour* 45(4):100800. doi:10.1016/j.endeavour.2021.100800.

Duelfer, Charles. 2004. *Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD*. Washington, DC: Central Intelligence Agency. <https://www.govinfo.gov/app/details/GPO-DUELFERREPORT/context>.

Duffy, John. 1968. *A History of Public Health in New York City, 1625-1866*. New York, NY: Russell Sage Foundation.

—. 1990. *The Sanitarians: A History of American Public Health*. Urbana, IL: University of Illinois Press.

Dulaney, Michael. 2020. “West Africa’s Ebola Outbreak Was ‘Catastrophic’—Here’s the Story of How it Was Contained.” *ABC News Australia*, April 6, 2020.

<https://www.abc.net.au/news/2020-04-06/how-the-west-africa-ebola-epidemic-was-contained/12094022>.

Duplessis, Sebastien, Cecile Lorrain, Benjamin Petre, et al. 2021. "Host Adaptation and Virulence in Heteroecious Rust Fungi." *Annu Rev Phytopathol* 59:403-22. doi:10.1146/annurev-phyto-020620-121149.

Düx, Ariane, Sebastian Lequime, Livia V. Patrono, et al. 2020. "Measles Virus and Rinderpest Virus Divergence Dated to the Sixth Century BCE." *Science* 368(6497):1367-70. doi:10.1126/science.aba9411.

Edgerton, Harold E., and James R. Killian Jr. 1979. *Moments of Vision: The Stroboscopic Revolution in Photography*. Cambridge, MA: MIT Press.

Egerton, Frank N. 2006. "A History of the Ecological Sciences, Part 20: Richard Bradley, Entrepreneurial Naturalist." *Bull Ecol Soc Am* 87(2):117-27. doi:10.1890/0012-9623(2006)87[117:AHOTES]2.0.CO;2.

—. 2012. "History of Ecological Sciences, Part 44: Phytopathology During the 1800s." *Bull Ecol Soc Am* 93(4):303-39. doi:10.1890/0012-9623-93.4.303.

Ehrenberg, Christian G. 1839. *Mikroskopische Analyse des Curländischen Meteorpapiers von 1686*. Berlin: Königliche Akademie der Wissenschaften.

—. 1849. *Passat-Staub und Blut-Regen*. Berlin: Königliche Akademie der Wissenschaften.

Eickhoff, Theodore C. 1996. "Airborne Disease: Including Chemical and Biological Warfare." *Am J Epidemiol* 144(8 Suppl):S39-46. doi:10.1093/aje/144.supplement_8.s39.

—. 1997. "Gordon Meiklejohn, M.D., 1911-1997." *J Infect Dis* 176(2):311-2. doi:10.1086/514046.

Eilperin, Julie. 2013. "How Attitudes Toward AIDS Have Changed, in the White House and Beyond." *Washington Post*, December 4, 2013.

Enders, John F. 1940. "The Etiology of Measles." In *Virus and Rickettsial Diseases with Especial Consideration of Their Public Health Significance*. Cambridge, MA: Harvard University Press.

Engelberg, Stephen. 2011. "New Evidence Adds Doubt to FBI's Case Against Anthrax Suspect." *ProPublica*, October 10, 2011. <https://www.propublica.org/article/new-evidence-disputes-case-against-bruce-e-ivins>.

Escapa, Isabel F., Tsute Chen, Yanmei Huang, et al. 2018. "New Insights into Human Nostril Microbiome from the Expanded Human Oral Microbiome Database (eHOMD): A Resource for the Microbiome of the Human Aerodigestive Tract." *mSystems* 3(6):e00187-18. doi:10.1128/mSystems.00187-18.

Etheridge, Elizabeth W. 1992. *Sentinel for Health: A History of the Centers for Disease Control*. Berkeley, CA: University of California Press.

Eurich, Friederich W. 1913. "Anthrax in the Woollen Industry, With Special Reference to Bradford." *Proc R Soc Med* 6:219-40. doi:10.1177/003591571300601411.

- Evans, Alfred S. 1973. "Pettenkofer Revisited: The Life and Contributions of Max von Pettenkofer (1818-1901)." *Yale J Biol Med* 46(3):161-76.
- Evans, Richard J. 2005. *Death in Hamburg: Society and Politics in the Cholera Years*. New York, NY: Penguin Books.
- Evans, Robin. 2011. *The Fabrication of Virtue: English Prison Architecture, 1750-1840*. Cambridge: Cambridge University Press.
- Ewin, Toby. 2020. "Modern Resonances of Imperial Germany's Biological-Warfare Sabotage Campaign, 1915-18." *Nonproliferation Rev* 27(4-6):277-87. doi:10.1080/10736700.2020.1866874.
- Fair, Gordon M. 1920. "Elements of the Theory Underlying the Disinfection of Water By Ultra Violet Light." *J Am Water Work Assoc* 7(3):325-42. <https://www.jstor.org/stable/41224662>.
- . 1963. "Fifty Years of Progress in Water Purification, 1913-63." *J Am Water Work Assoc* 55(7):813-24. <https://www.jstor.org/stable/41257762>.
- and William F. Wells. 1940. "US2198867A: Method of and Apparatus for Preventing Infection." *USPTO*, April 30, 1940. <https://patents.google.com/patent/US2198867A>.
- Fairchild, Amy L., David Rosner, James Colgrove, et al. 2010. "The EXODUS of Public Health What History Can Tell Us About the Future." *Am J Public Health* 100(1):54-63. doi:10.2105/AJPH.2009.163956.
- , Ronald Bayer, and James Colgrove. 2007. *Searching Eyes: Privacy, the State, and Disease Surveillance in America*. Berkeley, CA: University of California Press.
- Fancy, Nahyan, and Monica H. Green. 2021. "Plague and the Fall of Baghdad (1258)." *Med Hist* 65(2):157-77. doi:10.1017/mdh.2021.3.
- Farley, John. 1977. *The Spontaneous Generation Controversy from Descartes to Oparin*. Baltimore, MD: Johns Hopkins University Press.
- Farmer, Brit M. 2020. "March 2020: Dr. Anthony Fauci Talks with Dr. Jon Lapook About COVID-19." *CBS News*, March 8, 2020. <https://www.cbsnews.com/news/preventing-coronavirus-facemask-60-minutes-2020-03-08>.
- Farmer, Paul. 1999. *Infections and Inequalities: The Modern Plagues*. Berkeley, CA: University of California Press.
- Fauci, Anthony S. 2020. "Harvard Medical School Grand Rounds—Featuring Dr. Anthony S. Fauci." Aired September 10, 2020. <https://masscpr.hms.harvard.edu/event/harvard-medical-school-grand-rounds-featuring-dr-anthony-s-fauci>.
- . 2024. *On Call*. New York, NY: Viking.
- Fearnley, Lyle. 2010. "Epidemic Intelligence. Langmuir and the Birth of Disease Surveillance." *Behemoth* 3(3):36-56. doi:10.1524/behe.2010.0019.
- Fee, Elizabeth, and Theodore M Brown. 2001. "Preemptive Biopreparedness: Can We Learn Anything from History?" *Am J Public Health* 91(5):721-6. doi:10.2105/ajph.91.5.721.

- Feldman, Justin. 2022. "From Shutting Down the Virus to Letting It Rip: A Timeline of Biden's Pandemic Response." *Harvard Law School Bill of Health*, January 5, 2022. <https://blog.petrieflom.law.harvard.edu/2022/01/05/from-shutting-down-the-virus-to-letting-it-rip-a-timeline-of-bidens-pandemic-response>.
- Fennelly, Kevin P. 1997. "Personal Respiratory Protection Against Mycobacterium tuberculosis." *Clin Chest Med* 18(1):1-17. doi:10.1016/s0272-5231(05)70352-x.
- Fetch, Thomas G., Robert F. Park, Zacharias A. Pretorius, et al. 2021. "Stem Rust: Its History in Kenya and Research to Combat a Global Wheat Threat." *Can J Plant Pathol* 43(Sup2): S275-97. doi:10.1080/07060661.2021.1902860.
- Fields, Asia, and Mary Hudetz. 2020. "Coronavirus Spread at Life Care Center of Kirkland for Weeks, While Response Stalled." *Seattle Times*, March 18, 2020. <https://www.seattletimes.com/seattle-news/times-watchdog/coronavirus-spread-in-a-kirkland-nursing-home-for-weeks-while-response-stalled>.
- Fine, Daniel H. 2006. "Dr. Theodor Rosebury: Grandfather of Modern Oral Microbiology." *J Dent Res* 85(11):990-5. doi:10.1177/154405910608501103.
- First, Melvin W., Edward A. Nardell, William Chaisson, et al. 1999. "Guidelines for the Application of Upper-Room Ultraviolet Germicidal Irradiation for Preventing Transmission of Airborne Contagion—Part I: Basic Principles." *ASHRAE Trans* 105:869-76.
- Fisher, Richard B. 1977. *Joseph Lister, 1827-1912*. London: Macdonald and Jane's.
- Fitzgerald, Gerard J. 2003. "From Prevention to Infection: Intramural Aerobiology, Biomedical Technology, and the Origins of Biological Warfare Research in the United States, 1910-1955." Dissertation, Carnegie Mellon University.
- . 2021. *Intervals of Public Health*. Season 1, episode 13, "The Origins of Aerobiology and Airborne Disease Research in the United States, 1930-1955." Aired June 30, 2021, on Intervals. <https://rebrand.ly/m0uxwym>.
- Fleming, James R. 1996. *Historical Essays on Meteorology, 1919-1995: The Diamond Anniversary History Volume of the American Meteorological Society*. Boston, MA: American Meteorological Society.
- Flemming, Hans-Curt, and Stefan Wuertz. 2019. "Bacteria and Archaea on Earth and Their Abundance in Biofilms." *Nat Rev Microbiol* 17(4):247-60. doi:10.1038/s41579-019-0158-9.
- Flohr, Carsten. 1996. "The Plague Fighter: Wu Lien-Teh and the Beginning of the Chinese Public Health System." *Ann Sci* 53(4):361-80. doi:10.1080/00033799608560822.
- Flügge, Carl. 1897. "Ueberluftinfection." *Zeitschr Hyg Infectiosskr* 25:179-224.
- Forbes, Kristian M., Tarja Sironen, and Alexander Plyusnin. 2018. "Hantavirus Maintenance and Transmission in Reservoir Host Populations." *Curr Opin Virol* 28:1-6. doi:10.1016/j.coviro.2017.09.003.
- Ford, Gerald. 1975. "Statement on the Geneva Protocol of 1925 and the Biological Weapons Convention." *American Presidency Project*, January 22, 1975.

<https://www.presidency.ucsb.edu/documents/statement-the-geneva-protocol-1925-and-the-biological-weapons-convention>.

Forgey, Qunit, 2020. “‘Fauci’s a Disaster’: Trump Attacks Health Officials in Fiery Campaign Call.” *Politico*, October 19, 2020. <https://www.politico.com/news/2020/10/19/fauci-trump-wearing-mask-weakness-430114>.

Fracastoro, Girolamo. 1930. *Hieronymi Fracastorii de Contagione et Contagiosis Morbis et Eorum Curatione, Libri III*. New York, NY: Putnam.

—. 1984. *Fracastoro's Syphilis*. Geoffrey Eatough, ed. Liverpool: Francis Cairns.

Franchitti, Elena, Chiara Caredda, Elisa Anedda, et al. 2022. “Urban Aerobiome and Effects on Human Health: A Systematic Review and Missing Evidence.” *Atmosphere* 13(7):1148. doi:10.3390/atmos13071148.

Franck, Thomas. 2020. “Here Are the Industries Suffering the Biggest Job Losses in an Initial Look at Coronavirus Impact.” *CNBC*, April 3, 2020. <https://www.cnbc.com/2020/04/03/chart-shows-which-industries-saw-big-job-losses-in-march-2020.html>.

French, Paul. 2020. “In the 1918 Flu Pandemic, Not Wearing a Mask Was Illegal in Some Parts of America. What Changed?” *CNN*, April 4, 2020. <https://www.cnn.com/2020/04/03/americas/flu-america-1918-masks-intl-hnk/index.html>.

Friedman, David M. 2008. *The Immortalists: Charles Lindbergh, Dr. Alexis Carrel, and Their Daring Quest to Live Forever*. New York, NY: Ecco.

Fröhlich-Nowoisky, Janine, Christopher J. Kampf, Bettina Weber, et al. 2016. “Bioaerosols in the Earth System: Climate, Health, and Ecosystem Interactions.” *Atmos Res* 182:346-76. doi:10.1016/j.atmosres.2016.07.018.

Frontz, Amy J. 2023. “The Strategic National Stockpile Was Not Positioned to Respond Effectively to the Covid-19 Pandemic.” *U.S. Department of Health and Human Services Office of Inspector General*, October 2023. <https://oig.hhs.gov/oas/reports/region4/42002028.asp>.

Fullilove, Courtney. 2017. *The Profit of the Earth: The Global Seeds of American Agriculture*. Chicago, IL: University of Chicago Press.

Gage, Beverly. 2022. *G-Man: J. Edgar Hoover and the Making of the American Century*. New York, NY: Viking.

Ganz, Cheryl R. 2008. *The 1933 Chicago World’s Fair: Century of Progress*. Urbana, IL: University of Illinois Press.

Gao, Fangzhou, Liangying He, Hong Bai, et al. 2023. “Airborne Bacterial Community and Antibiotic Resistome in the Swine Farming Environment: Metagenomic Insights into Livestock Relevance, Pathogen Hosts and Public Risks.” *Environ Int* 172:107751. doi:10.1016/j.envint.2023.107751.

Gao, Qiang, Grant B. Deane, and Lian Shen. 2021. “Bubble Production by Air Filament and Cavity Breakup in Plunging Breaking Wave Crests.” *J Fluid Mech* 929:A44. doi:10.1017/jfm.2021.890.

Garcia-Pichel, Ferran. 2023. "The Microbiology of Biological Soil Crusts." *Annu Rev Microbiol* 77:149-71. doi:10.1146/annurev-micro-032521-015202.

Garger, Kenneth. 2020. "Dr. Fauci: Research Showing Coronavirus Can Travel 27 Feet in Air Is 'Terribly Misleading'." *New York Post*, March 31, 2020. <https://nypost.com/2020/03/31/dr-fauci-research-showing-coronavirus-can-travel-27-ft-is-misleading>.

Gari, Lutfallah. 2002. "Arabic Treatises on Environmental Pollution Up to the End of the Thirteenth Century." *Environ Hist* 8(4):475-88. doi:10.3197/096734002129342747.

Garner, J. S. 1996. "Guideline for Isolation Precautions in Hospitals. Part I. Evolution of Isolation Practices, Hospital Infection Control Practices Advisory Committee." *Am J Infect Control* 24(1):24-31. doi:10.1016/s0196-6553(96)90050-4.

— and Hospital Infection Control Practices Advisory Committee. 1996. "Guideline for Isolation Precautions in Hospitals. The Hospital Infection Control Practices Advisory Committee." *Infect Control Hosp Epidemiol* 17(1):53-80. doi:10.1086/647190.

Garnett, John R. 2021. "'Wheat Man's Burden': Wheat Rust, Trickle Down Agricultural Economics, and the Origins of the Green Revolution in Mexico (1842-1970)." Dissertation, George Mason University.

Geison, Gerald L. 1995. *The Private Science of Louis Pasteur*. Princeton, NJ: Princeton University Press.

Geltner, Guy. 2020. "The Path to Pistoia: Urban Hygiene Before the Black Death." *Past & Present* 246(1):3-33. doi:10.1093/pastj/gtz028.

Geoghegan, John J. 2017. "Vanished!: What Happened to the Hawaii Clipper?" *HistoryNet*, June 21, 2017. <https://www.historynet.com/vanished-happened-hawaii-clipper>.

George, Paul B. L., Florent Rossi, Magali-Wen St-Germain, et al. 2022. "Antimicrobial Resistance in the Environment: Towards Elucidating the Roles of Bioaerosols in Transmission and Detection of Antibacterial Resistance Genes." *Antibiotics* 11(7):974. doi:10.3390/antibiotics11070974.

Gering, Sarah M., Amy P. Sullivan, Sonia M. Kreidenweis, et al. 2024. "Limited Evidence for a Microbial Signal in Ground-Level Smoke Plumes." *J Geophys Res* 129(4):e2023JD039416. doi:10.1029/2023JD039416.

Gerone, Peter J., Robert B. Couch, Garrett V. Keefer, et al. 1966. "Assessment of Experimental and Natural Viral Aerosols." *Bacteriol Rev* 30(3):576-88. doi:10.1128/br.30.3.576-588.1966.

Gibney, Alex, Ophelia Harutyunyan, and Suzanne Hillinger. 2020. *Totally Under Control*. Aired October 13, 2020, on Hulu. <https://www.hulu.com/movie/4e196a01-bdeb-4b2b-903d-492b65f9e337>.

Gigliotti, Francis, Andrew H. Limper, and Terry Wright. 2014. "Pneumocystis." *Cold Spring Harb Perspect Med* 4(12):a019828. doi:10.1101/cshperspect.a019828.

Ginn, Richard V. N. 1997. *The History of the U.S. Army Medical Service Corps*. Washington, DC: U.S. Office of the Surgeon General.

Glaisher, James. 1871. *Travels in the Air*. London: Richard Bently.

Glass, Andrew. 2018. "FDR Calls for 'Quarantine' of Aggressor Nations, Oct. 5, 1937." *Politico*, October 5, 2018. <https://www.politico.com/story/2018/10/05/fdr-quarantine-aggressor-nations-1937-855522>.

Glasspool, Ian J., and Robert A. Gastaldo. 2023. "A Baptism by Fire: Fossil Charcoal from Eastern Euramerica Reveals the Earliest (Homerian) Terrestrial Biota Evolved in a Flammable World." *J Geol Soc* 180(2):jgs2022-072. doi:10.1144/jgs2022-072.

Global Times Staff Reporters. 2020. "GT Investigates: Review of 40-Day Response." *Global Times*, December 16, 2020. <https://www.globaltimes.cn/page/202012/1210178.shtml>.

Gnegy-Spencer, Mariah, Chase Gohlke, and Linsey C. Marr. "Effect of a Barrier on Spatial Distribution of Respiratory Particles in a Room." *Aerosol Sci Tech* 57(5):384-405. doi:10.1080/02786826.2023.2181142.

Golan, Jacob J., and Anne Pringle. 2017. "Long-Distance Dispersal of Fungi." *Microbiol Spectr* 5(4). doi:10.1128/microbiolspec.funk-0047-2016.

Goldberg, Lotem, Yoel Levinsky, Nufar Marcus, et al. 2021. "SARS-CoV-2 Infection Among Health Care Workers Despite the Use of Surgical Masks and Physical Distancing—The Role of Airborne Transmission." *Open Forum Infect Dis* 8(3):ofab036. doi:10.1093/ofid/ofab036.

Goldman, Emanuel. 2020. "Exaggerated Risk of Transmission of COVID-19 by Fomites." *Lancet Infect Dis* 20(8):892-3. doi:10.1016/S1473-3099(20)30561-2.

Gong, Buyn. 2022. "A Genealogical Study of Facemasks in China: From Hygienic Modernity to Care." *Fudan J Humanit Soc Sci* 15:189-206. doi:10.1080/02786826.2023.2181142.

Goodnough, Abby, and Knvul Sheikh. 2020. "C.D.C. Weighs Advising Everyone to Wear a Mask." *New York Times*, March 31, 2020.

Goodyear, Dana. 2014. "Death Dust." *New Yorker*, January 20, 2014. <https://www.newyorker.com/magazine/2014/01/20/death-dust>.

Gordon, Greg, and Sherri Cruz. 2001. "Biological Warfare May Be Next, Experts Say." *Star Tribune*, September 18, 2001.

Gordon, Julian, Prasanthi Gandhi, Gajendra Shekhawat, et al. 2015. "A Simple Novel Device for Air Sampling by Electrokinetic Capture." *Microbiome* 3(1). doi:10.1186/s40168-015-0141-2.

Government of Japan. 2020. "Avoiding the Three Cs: A Key to Preventing the Spread of Covid-19." https://www.japan.go.jp/kizuna/2020/avoiding_the_three_cs.html.

Graysmith, Robert. 2003. *Amerithrax: The Hunt for the Anthrax Killer*. New York, NY: Berkley Books.

Great Britain Parliament House of Commons. 1911. "Plague in Harbin District (European Doctors)." *Hansard* 21.

Greenblatt, Stephen. 2011. *The Swerve: How the World Became Modern*. New York, NY: W. W. Norton & Co.

Greenfeld, Karl T. 2006. *China Syndrome: The True Story of the 21st Century's First Great Epidemic*. New York, NY: HarperCollins.

—. 2020. "When SARS Ended." *New Yorker*, April 17, 2020.

<https://www.newyorker.com/culture/personal-history/when-sars-ended>.

Greenfieldboyce, Nell. 2020. "WHO Reviews 'Current' Evidence on Coronavirus Transmission Through Air." *National Public Radio*, March 28, 2020.

<https://www.npr.org/2020/03/28/823292062/who-reviews-available-evidence-on-coronavirus-transmission-through-air>.

Greenhalgh, Trisha, C. R. MacIntyre, Michael G. Baker, et al. 2024. "Masks and Respirators for Prevention of Respiratory Infections: A State of the Science Review." *Clin Microbiol Rev* 37(2):e0012423. doi:10.1128/cmr.00124-23.

Greenwood, Major. 1927. "Some Epidemiological Observations on Foot-and-Mouth Disease, with Special Reference to the Recent Experience of Holland." *J Hyg* 26(4):465-89. doi:10.1017/s0022172400009293.

—. 1935. *Epidemics and Crowd-Diseases: An Introduction to the Study of Epidemiology*. London: Williams & Norgate.

Gregory, Philip H. 1961. *The Microbiology of the Atmosphere*. London: L. Hill.

Griffin, Dale W. 2004. "Terrestrial Microorganisms at an Altitude of 20,000 M in Earth's Atmosphere." *Aerobiologia* 20(2):135-40. doi:10.1023/B:AERO.0000032948.84077.12.

—. 2021. "The Concept of Evanescent Microbial Ecosystems in Earth's Atmosphere." In *Microbes: The Foundation Stone of the Biosphere*. Edited by Christon J. Hurst. Cham: Springer.

—., Christina A. Kellogg, Virginia H. Garrison, et al. 2002. "The Global Transport of Dust: An Intercontinental River of Dust, Microorganisms and Toxic Chemicals Flows Through the Earth's Atmosphere." *Am Sci* 90(3):228-35. doi:10.1511/2002.3.228.

Grinnell, Francis B. 1928. "Streptococcus Studies I. *Streptococcus viridans* Derived from Single Cell Strains of *Streptococcus hemolyticus*." *J Bacteriol* 16(2):117-21. doi:10.1128/jb.16.2.117-121.1928.

Grote, Mathias. 2022. "Microbes Before Microbiology: Christian Gottfried Ehrenberg and Berlin's Infusoria." *Endeavour* 46(1-2):100815. doi:10.1016/j.endeavour.2022.100815.

Guarino, Ben. 2017. "Shaking Hands is 'Barbaric': Donald Trump, the Germaphobe in Chief." *Washington Post*, January 12, 2017.

Guarino, Ben, Sarah P. Bailey, and Alex Horton. 2020. "One-Mile Containment Zone Ordered for New Rochelle to Curb Coronavirus Outbreak." *Washington Post*, March 10, 2020.

Guillemin, Jeanne. 2005. *Biological Weapons: From the Invention of State-Sponsored Programs to Contemporary Bioterrorism*. New York, NY: Columbia University Press.

—. 2006. "Scientists and the History of Biological Weapons: A Brief Historical Overview of the Development of Biological Weapons in the Twentieth Century." *EMBO Rep* 7:S45-9. doi:10.1038/sj.embor.7400689.

—. 2011. *American Anthrax: Fear, Crime, and the Investigation of the Nation's Deadliest Bioterror Attack*. New York, NY: Times Books.

Gwertzman, Bernard. 1980. "Soviet Mishap Tied to Germ-War Plant." *New York Times*, March 19, 1980.

Haberman, Maggie. 2021. "Trump and His Wife Received Coronavirus Vaccine Before Leaving the White House." *New York Times*, March 1, 2021.

Hagedorn, Monica, Kyle H. Rohde, David G. Russell, et al. 2009. "Infection by Tubercular Mycobacteria Is Spread by Nonlytic Ejection from Their Amoeba Hosts." *Science* 323(5922):1729-33. doi:10.1126/science.1169381.

Hales, Stephen. 1752. "A Description of the Ventilators Which Are Fixed in Newgate." *Gentleman's Magazine* 22:179-82.

Hall, Elisha. 2021. "Influenza." *Epidemiology and Prevention of Vaccine-Preventable Diseases*. <https://www.cdc.gov/vaccines/pubs/pinkbook/flu.html>.

Hamilton, William D. 1996. *Narrow Roads of Gene Land: The Collected Papers of W. D. Hamilton*. New York, NY: Oxford University Press.

— and Tim M. Lenton. 1998. "Spora and Gaia: How Microbes Fly with Their Clouds." *Ethol Ecol Evol* 10(1):1-16. doi:10.1080/08927014.1998.9522867.

Hamm, Paris S., John W. Taylor, Joseph A. Cook, et al. 2020. "Decades-Old Studies of Fungi Associated with Mammalian Lungs and Modern DNA Sequencing Approaches Help Define the Nature of the Lung Mycobiome." *PLoS Pathog* 16(7):e1008684. doi:10.1371/journal.ppat.1008684.

Hamner, Lea, Polly Dubbel, Ian Capron, et al. 2020. "High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice—Skagit County, Washington, March 2020." *Morb Mortal Wkly Rep* 69(19):606-10. doi:10.15585/mmwr.mm6919e6.

Hansstein, Francesca V., and Fabián Echegaray. 2018. "Exploring Motivations Behind Pollution-Mask Use in a Sample of Young Adults in Urban China." *Global Health* 14(1):122. doi:10.1186/s12992-018-0441-y.

Hare, Ronald. 1940. "The Expulsion of Haemolytic Streptococci by Nasopharyngeal Carriers." *Can J Public Health* 31(11):539-55. <https://www.jstor.org/stable/41978028>.

—. 1943. "Memorandum on Possible Methods for the Prevention of Rheumatic Manifestations in the Armed Forces." *Can Med Assoc J* 48(2):116-21.

—. 1945. "Aerial Infection." *Br Med J* 1(4393):383.

—. 1964. "The Transmission of Respiratory Infections." *Proc R Soc Med* 57(3):221-30.

—. 1982. "New Light on the History of Penicillin." *Med Hist* 26(1):1-24. doi:10.1017/s0025727300040758.

— and Dorothy M. Mackenzie. 1946. "The Source and Transmission of Nasopharyngeal Infections Due to Certain Bacteria and Viruses." *Br Med J* 1(4457):865-70.

- Harmon, Amy. 2020. "Inside the Race to Contain America's First Coronavirus Case." *New York Times*, February 5, 2020.
- Harris, Gardiner. 2005a. "Bush Announces Plan to Prepare for Flu Epidemic." *New York Times*, November 2, 2005.
- . 2005b. "From Washington, a Story About a Killer Flu." *New York Times*, October 16, 2005.
- Harris, Sheldon H. 1992. "Japanese Biological Warfare Research on Humans: A Case Study of Microbiology and Ethics." *Ann N Y Acad Sci* 666:21-52. doi:10.1111/j.1749-6632.1992.tb38021.x.
- . 1995. *Factories of Death: Japanese Biological Warfare, 1932-45, and the American Cover-up*. New York, NY: Routledge.
- Harris, Taylor T. 2020. "Schnucks Advises All Customers to Cover Faces in Stores." *St. Louis Post-Dispatch*, April 9, 2020.
- Harrison, Susan. 1968. "C&B Tactics Denounced." *Morning Herald*, p. 23.
- Hartmann, Susan, Meilee Ling, Lasse S. A. Dreyer, et al. 2022. "Structure and Protein-Protein Interactions of Ice Nucleation Proteins Drive Their Activity." *Front Microbiol* 13:872306. doi:10.3389/fmicb.2022.872306.
- Harvard College. 1922. *Harvard College Class of 1916: Secretary's Third Report*. Cambridge, MA: Harvard University Press.
- Harvard School of Public Health. 1937. *The Environment and Its Effect Upon Man*. Cambridge, MA: Harvard University Press.
- Harwood, Jonathan. 2018. "Green Revolution." In *The International Encyclopedia of Anthropology*. Edited by Hilary Callan. Hoboken, NJ: Wiley-Blackwell.
- Haskell, Royal J., and Howard P. Barss. 1939. "Fred Campbell Meier, 1893-1938." *Phytopathology* 29:293-302.
- Haskin, Frederick J. 1926. "Now Artificially Grow Oysters." *Fresno Morning Republican*, September 2, 1926.
- Hawkins, Nichola, and Eric Boa. 2020. "Ug99 Stem Rust: Breaching Wheat's Defences." *Br S Plant Pathol*. doi:10.13140/RG.2.2.10846.92484.
- Head, Jennifer R., Gail Sondermeyer-Cooksey, Alexandra K. Heaney, et al. 2022. "Effects of Precipitation, Heat, and Drought on Incidence and Expansion of Coccidioidomycosis in Western USA: A Longitudinal Surveillance Study." *Lancet Planet Health* 6(10):e793-803. doi:10.1016/S2542-5196(22)00202-9.
- Hedenström, Anders, Gabriel Norevik, Kajsa Warfvinge, et al. 2016. "Annual 10-Month Aerial Life Phase in the Common Swift *Apus apus*." *Curr Biol* 26(22):3066-70. doi:10.1016/j.cub.2016.09.014.

- Hedington, Emma. 2021. "Shelly L. Miller Shares How COVID-19 Affected Her Research." *ACS Axial*, January 6, 2021. <https://axial.acs.org/2021/01/06/shelly-l-miller-shares-how-covid-19-affected-her-research>.
- Henderson, John. 2019. *Florence Under Siege: Surviving Plague in an Early Modern City*. New Haven, CT: Yale University Press.
- Heneghan, Carl J., Elizabeth A. Spencer, Jon Brassey, et al. 2022. "SARS-CoV-2 and the Role of Airborne Transmission: A Systematic Review ." *F1000Research* 10:232. doi:10.12688/f1000research.52091.3.
- Herrmann, Dorothy. 1992. *Anne Morrow Lindbergh*. New York, NY: Ticknor & Fields.
- Hersh, Seymour M. 1968. "Chemical and Biological Weapons—The Secret Arsenal." *New York Times*, August 25, 1968.
- Hertog, Susan. 1999. *Anne Morrow Lindbergh: Her Life*. New York, NY: Doubleday.
- Hessler, Peter. 2020a. "How China Controlled the Coronavirus." *New Yorker*, August 10, 2020. <https://www.newyorker.com/magazine/2020/08/17/how-china-controlled-the-coronavirus>.
- . 2020b. "Life on Lockdown in China." *New Yorker*, March 23, 2020. <https://www.newyorker.com/magazine/2020/03/30/life-on-lockdown-in-china>.
- Hitchens, Arthur P. 1940. "Experience of the Army and Civilian Conservation Corps in Handling Newly Mobilized Men." *Am J Public Health Nations Health* 30(11):1297-301. doi:10.2105/ajph.30.11.1297.
- . 1941. "The Control of Infectious Diseases in Rapidly Mobilized Troops." *Ann Intern Med* 15(2):172-7. doi:10.7326/0003-4819-15-2-172.
- Hobza, Pavel. 2020. "Anaximenes' ἀήρ as Generating Mist and Generated Air." *Apeiron* 53(2):97-122. doi:10.1515/apeiron-2018-0058.
- Hoffman, Bruce. 2001. "One-Alarm Fire." *Atlantic*, December 2001. <https://www.theatlantic.com/magazine/archive/2001/12/one-alarm-fire/302350>.
- Holla, William A. 1946. "Invisible Lifeguard." *Pittsburgh Sun-Telegraph*, March 10, 1946.
- . 1949. *Annual Report, Westchester County Department of Health*.
- Holmes, Edward C., Gytis Dudas, Andrew Rambaut, et al. 2016. "The Evolution of Ebola Virus: Insights from the 2013-2016 Epidemic." *Nature* 538(7624):193-200. doi:10.1038/nature19790.
- Homeland Security Council. 2005. "National Strategy for Pandemic Influenza." November 1, 2005. <https://www.cdc.gov/flu/pandemic-resources/pdf/pandemic-influenza-strategy-2005.pdf>.
- . 2006. "National Strategy for Pandemic Influenza: Implementation Plan." May 6, 2006. <https://www.cdc.gov/flu/pandemic-resources/pdf/pandemic-influenza-implementation.pdf>.
- Hong Kong Department of Health. 2003. "Outbreak of Severe Acute Respiratory Syndrome (SARS) at Amoy Gardens, Kowloon Bay, Hong Kong: Main Findings of the Investigation." April 17, 2003. https://www.info.gov.hk/info/sars/pdf/amoy_e.pdf.

- Honigsbaum, Mark. 2019. *The Pandemic Century: One Hundred Years of Panic, Hysteria, and Hubris*. New York, NY: W. W. Norton & Co.
- Hooper, James, and Samuel Marx. 2018. "A Global Doubling of Dust Emissions During the Anthropocene?" *Glob Planet Change* 169:70-91. doi:10.1016/j.gloplacha.2018.07.003.
- Horii, Mitsutoshi. 2014. "Why Do the Japanese Wear Masks? A Short Historical Review." *Electronic Journal of Contemporary Japanese Studies* 14(2):1-14.
- Horrigan, Brian. 2002. "'My Own Mind and Pen': Charles Lindbergh, Autobiography, and Memory." *Minnesota History* 58(1):2-15.
- Hort, Arthur, 1916. *Theophrastus: Enquiry into Plants, and Minor Works on Odours and Weather Signs*. London: William Heinemann.
- Houk, Vernon N. 1980. "Spread of Tuberculosis Via Recirculated Air in a Naval Vessel: The Byrd Study." *Ann N Y Acad Sci* 353:10-24. doi:10.1111/j.1749-6632.1980.tb18901.x.
- , Donald C. Kent, John H. Baker, et al. 1968a. "The Byrd Study: In-Depth Analysis of a Micro-Outbreak of Tuberculosis in a Closed Environment." *Arch Environ Health* 16(1):4-6. doi:10.1080/00039896.1968.10665007.
- , John H. Baker, Kurt Sorensen, et al. 1968b. "The Epidemiology of Tuberculosis Infection in a Closed Environment." *Arch Environ Health* 16(1):26-35. doi:10.1080/00039896.1968.10665011.
- Howard-Jones, Norman. 1973. "Gelsenkirchen Typhoid Epidemic of 1901, Robert Koch, and the Dead Hand of Max von Pettenkofer." *Br Med J* 1 (5845):103-5. doi:10.1136/bmj.1.5845.103.
- . 1975. *The Scientific Background of the International Sanitary Conferences, 1851-1938*. Geneva: World Health Organization.
- . 1977. "Fracastoro and Henle: A Re-Appraisal of Their Contribution to the Concept of Communicable Diseases." *Medical History* 21(1):61-8. doi:10.1017/s0025727300037170.
- Hoy, Suellen M. 1996. *Chasing Dirt: The American Pursuit of Cleanliness*. New York, NY: Oxford University Press.
- Hoyt, Kendall. 2006. "Vaccine Innovation: Lessons from World War II." *J Public Health Policy* 27(1):38-57. doi:10.1057/palgrave.jphp.3200064.
- Huang, Jianrong, Hongqiang Feng, V. A. Drake, et al. 2024. "Massive Seasonal High-Altitude Migrations of Nocturnal Insects Above the Agricultural Plains of East China." *Proc Natl Acad Sci* 121(18):e2317646121. doi:10.1073/pnas.2317646121.
- Huang, Shu, Wei Hu, Jie Chen, et al. 2021. "Overview of Biological Ice Nucleating Particles in the Atmosphere." *Environ Int* 146:106197. doi:10.1016/j.envint.2020.106197.
- Hudetz, Mary, Katherine A. Long, Daniel Gilbert, et al. 2020. "First Days at the Heart of an Outbreak: Life Care Nursing Home Becomes National Epicenter of Coronavirus." *Seattle Times*, March 3, 2020.

- Hugh-Jones, Martin. 1992. "Wickham Steed and German Biological Warfare Research." *Intell Natl Secur* 7(4):379-402. doi:10.1080/02684529208432176.
- and Jason Blackburn. 2009. "The Ecology of *Bacillus anthracis*." *Mol Aspects Med* 30(6):356-67. doi:10.1016/j.mam.2009.08.003.
- Hughes, J. D. 1985. "Theophrastus as Ecologist." *Environ Rev* 9(4):296-306. doi:10.2307/3984460.
- Hui, David S. C., and Alimuddin Zumla. 2019. "Severe Acute Respiratory Syndrome: Historical, Epidemiologic, and Clinical Features." *Infect Dis Clin North Am* 33(4):869-89. doi:10.1016/j.idc.2019.07.001.
- Hume, E.E. 1927. *Max von Pettenkofer*. New York, NY: P.B. Hoeber.
- Hunter, William G. 1884a. "The Origin of the Cholera Epidemic of 1883 in Egypt." *Trans Epidemiol Soc Lond* 3:43-64.
- . 1884b. "Remarks on the Epidemic of Cholera in Egypt." *Br Med J* 1(1203):91-6. doi:10.1136/bmj.1.1203.91.
- Hurt, R. D. 2020. *The Green Revolution in the Global South: Science, Politics, and Unintended Consequences*. Tuscaloosa, AL: University of Alabama Press.
- Huston, James A. 1968. "Selective Service in World War II." *Current History* 54(322):345-50. <https://www.jstor.org/stable/45311922>.
- Hutchinson, Bill. 2020. "'Don't Bury Us Before We're Dead': Sister Mourns Senior Citizen Sibling Who Died from Coronavirus." *ABC News*, March 26, 2020. <https://abcnews.go.com/Health/dont-bury-us-dead-sister-mourns-senior-citizen/story?id=69796467>.
- Iapichino, Martina, Yen W. Wang, Savannah Gentry, et al. 2020. "A Precise Relationship Among Buller's Drop, Ballistospore, and Gill Morphologies Enables Maximum Packing of Spores Within Gilled Mushrooms." *HAL Open Sci*, November 18, 2020. <https://hal.science/hal-03011381>.
- ICFUST. 2023. "Don Milton—1st International Congress on Far-UVC Science and Technology." *YouTube*, June 22, 2023. <https://www.youtube.com/watch?v=MefmQL0fY3o>.
- Imshenetsky, Alexandre A., S. V. Lysenko, and G. A. Kazakov. 1978. "Upper Boundary of the Biosphere." *Appl Environ Microbiol* 35(1):1-5. doi:10.1128/aem.35.1.1-5.1978.
- Inglesby, Thomas V., David T. Dennis, Donald A. Henderson, et al. 2000. "Plague as a Biological Weapon: Medical and Public Health Management." *JAMA* 283(17):2281-90. doi:10.1001/jama.283.17.2281.
- , Tara O'Toole, Donald A. Henderson, et al. 2002. "Anthrax as a Biological Weapon, 2002: Updated Recommendations for Management." *JAMA* 287(17):2236-52. doi:10.1001/jama.287.17.2236.
- Inslee, Jay. 2020. "Inslee Issues Emergency Proclamation That Limits Large Events to Minimize Public Health Risk During COVID-19." *Medium*, March 11, 2020.

<https://medium.com/wagovernor/inslee-issues-emergency-proclamation-that-limits-large-events-to-minimize-public-health-risk-38b4d79a563d>.

Institute of Medicine. 1992. *Emerging Infections*. Washington, DC: National Academies Press

—. 2007. *Preparing for an Influenza Pandemic*. Washington, DC: National Academies Press.

—. 2009. *Microbial Evolution and Co-Adaptation*. Washington, DC: National Academies Press.

International Congress for Microbiology, Istituto superiore di sanità. 1953. "Symposium."

International Ultraviolet Association. 2021. "Far UV-C Radiation: Current State-of Knowledge." May 14, 2021. <https://www.iuva.org/Projects-Articles-Repository/10503221>.

Iskrant, Albert P., and Eugene Rogot. 1953. "Trends in Tuberculosis Mortality in Continental United States." *Public Health Rep (1896)* 68(9):911-9.

Jaax, Nancy K., Peter B. Jährling, Thomas W. Geisbert, et al. 1995. "Transmission of Ebola Virus (Zaire Strain) to Uninfected Control Monkeys in a Biocontainment Laboratory." *Lancet* 346(8991-8992):1669-71. doi:10.1016/s0140-6736(95)92841-3.

Jackson, Katrina M., Marcus de Melo Teixeira, and Bridget M. Barker. 2024. "From soil to clinic: current advances in understanding *Coccidioides* and coccidioidomycosis." *Microbiology and Molecular Biology Reviews* (2024): e00161-23.

Jacob, Shevin T, Ian Crozier, William A. Fischer, et al. 2020. "Ebola Virus Disease." *Nat Rev Dis Primers* 6(1):13. doi:10.1038/s41572-020-0147-3.

Jaeger, Jenifer L., Minal Patel, Nila Dharan, et al. 2011. "Transmission of 2009 Pandemic Influenza A (H1N1) Virus Among Healthcare Personnel—Southern California, 2009." *Infect Control Hosp Epidemiol* 32(12):1149-57. doi:10.1086/662709.

Jarmanning, Ally, and Steve Brown. 2020. "Baker Bans Dining in Bars and Restaurants, Closes Schools, Forbids Gatherings of More Than 25." *WBUR*, March 15, 2020. <https://www.wbur.org/news/2020/03/15/baker-bans-dining-in-bars-and-restaurants-closes-schools-bars-gatherings-of-more-than-25>.

Jefferson, Tom, Carl J. Heneghan, Elizabeth Spencer, et al. 2022. "A Hierarchical Framework for Assessing Transmission Causality of Respiratory Viruses." *Viruses* 14:1605. doi:10.3390/v14081605.

Jennison, Marshall W. 1934. "Laboratory: A Rapid and Accurate Semi-Automatic Delivery Pipette." *Am J Public Health Nations Health* 24(1):59-62. doi:10.2105/ajph.24.1.59.

—. 1935. "Some Quantitative Relationships in Bacterial Population Cycles." *J Bacteriol* 30(6):603-23. doi:10.1128/jb.30.6.603-623.1935.

—. 1941. "The Dynamics of Sneezing—Studies by High-Speed Photography." *Sci Monthly* 52(1):24-33.

— and Harold E. Edgerton. 1940. "Droplet Infection of Air: High-Speed Photography of Droplet Production by Sneezing." *Proc Soc Exp Biol Med* 43(3):455-8. doi:10.3181/00379727-43-11230P.

— and John W. M. Bunker. 1934. “Analysis of the Movement of Cilia from the Clam (*Mya*) by High-Speed Photography with Stroboscopic Light.” *J Cell Comp Physiol* 5(2):189-97. doi:10.1002/jcp.1030050206.

Jiang, Xiaoqing, Chunhui Wang, Jinyuan Guo, et al. 2022. “Global Meta-Analysis of Airborne Bacterial Communities and Associations with Anthropogenic Activities.” *Environ Sci Technol* 56(14):9891-902. doi:10.1021/acs.est.1c07923.

Jimenez, Jose L., Linsey C. Marr, Katherine Randall, et al. 2021. “Echoes Through Time: The Historical Origins of the Droplet Dogma and Its Role in the Misidentification of Airborne Respiratory Infection Transmission.” *SSRN Electronic Journal*. doi:10.2139/ssrn.3904176.

—, Linsey C. Marr, Katherine Randall, et al. 2022. “What Were the Historical Reasons for the Resistance to Recognizing Airborne Transmission During the COVID-19 Pandemic?” *Indoor Air* 32(8):e13070. doi:10.1111/ina.13070.

Johns Hopkins Center for Health Security. 2017. “The Characteristics of Pandemic Pathogens.” November 9, 2017. <https://centerforhealthsecurity.org/sites/default/files/2022-12/180510-pandemic-pathogens-report.pdf>.

—. 2019a. “Preparedness for a High-Impact Respiratory Pathogen Pandemic.” September 2019. <https://centerforhealthsecurity.org/sites/default/files/2023-02/190918-gmpbreport-respiratorypathogen.pdf>.

—. 2019b. “Tabletop Exercise: Event 201.” October 18, 2019. <https://centerforhealthsecurity.org/our-work/tabletop-exercises/event-201-pandemic-tabletop-exercise>.

Johnson, Carolyn Y., Lena H. Sun, and Andrew Freedman. 2020. “Social Distancing Could Buy U.S. Valuable Time Against Coronavirus.” *Washington Post*, March 10, 2020.

Johnson, Graham R., Lidia Morawska, Zoran D. Ristovski, et al. 2011. “Modality of Human Expired Aerosol Size Distributions.” *J Aerosol Sci* 42(12):839-51. doi:10.1016/j.jaerosci.2011.07.009.

Johnson, Steven. 2006. *The Ghost Map*. New York, NY: Riverhead Books.

Johnston, Lynn B., and John M. Conly. 2004. “Severe Acute Respiratory Syndrome: What Have We Learned Two Years Later?” *Can J Infect Dis* 15(6):309-12. doi:10.1155/2004/964258.

Jones, Liz. 2020. “Nicki Hamilton, 83, Skagit Valley Choir Singer and Women’s Rights Supporter.” *KUOW*, May 1, 2020. <https://www.kuow.org/stories/nicky-hamilton-83-skagit-valley-choir-singer-and-women-s-rights-supporter>.

Jones, Susan D. 2010. *Death in a Small Package: A Short History of Anthrax*. Baltimore, MD: Johns Hopkins University Press.

Jordan Jr., William S. 1961. “The Mechanism of Spread of Asian Influenza.” *Am Rev Respir Dis* 83(2)Pt 2:29-40. doi:10.1164/arrd.1961.83.2P2.29.

Jouanna, Jacques. 2012. "Air, Miasma and Contagion in the Time of Hippocrates and the Survival of Miasmas in Post-Hippocratic Medicine." In *Greek Medicine from Hippocrates to Galen*. Edited by Philip van der Eijk. Leiden: Brill.

Juengling, Freimut D., Antonio Maldonado, Frank Wuest, et al. 2020. "The Role of Nuclear Medicine for COVID-19: Time to Act Now." *J Nucl Med* 61(6):781-2. doi:10.2967/jnumed.120.246611.

Kabat, Elvin A. 1983. "Getting Started 50 Years Ago—Experiences, Perspectives, and Problems of the First 21 Years." *Ann Rev Immunol* 1(1):1-32. doi:10.1146/annurev.iy.01.040183.000245.

Kaempffert, Waldemar. 1934a. "The Week in Science: Star of Bethlehem a Nova?" *New York Times*, December 23, 1934.

—. 1934b. "Big Balloon Ready for Stratosphere." *New York Times*, June 24, 1934.

—. 1944. "Tests of Ultra-Violet Lamps in Checking the Spread of Transmissible Diseases." *New York Times*, October 8, 1944.

—. 1947. "Germ Warfare Brought to the Fore Again by Publication of Rosebury-Kabat Paper." *New York Times*, May 25, 1947.

Kang, Dake. 2022. "Packed ICUs, Crowded Crematoriums: COVID Roils Chinese Towns." *Associated Press*, December 26, 2022. <https://apnews.com/article/health-china-beijing-covid-d0718b53ded7fb1a70c2db8e564ed072>.

Kaplan, Morris. 1957. "Epidemic Circled World in a Year." *New York Times*, October 4, 1957.

Kaplan, Sarah, Desmond Butler, Juliet Eilperin, et al. 2020. "The Code: How Genetic Science Helped Expose a Secret Coronavirus Outbreak." *Washington Post*, September 24, 2020.

Karnik, Harshada, Elizabeth Wrigley-Field, Zachary Levin, et al. 2023. "Examining Excess Mortality Among Critical Workers in Minnesota During 2020-2021: An Occupational Analysis." *Am J Public Health* 113(11):1219-22. doi:10.2105/AJPH.2023.307395.

Karsner, Howard T. 1938. "Earl Baldwin Mckinley 1894-1938." *Am J Pathol* 14(6):i4-5.

Katz, Daniel S. W., Jonathan R. Morris, and Stuart A. Batterman. 2020. "Pollen Production for 13 Urban North American Tree Species." *Aerobiologia* 36(3):401-15. doi:10.1007/s10453-020-09638-8.

Kaufmann, Stefan H., and Ulrich E. Schaible. 2005. "100th Anniversary of Robert Koch's Nobel Prize for the Discovery of the Tubercle Bacillus." *Trends Microbiol* 13(10):469-75. doi:10.1016/j.tim.2005.08.003.

Kawasaki, Tomisaku, and Shiro Naoe. 2014. "History of Kawasaki Disease." *Clin Exp Nephrol* 18(2):301-4. doi.org/10.1007/s10157-013-0877-6.

Kearnan, Scott. 2013. "The Beat Goes on." *Boston Spirit*, September 13, 2013. <https://bostonspiritmagazine.com/2013/09/the-beat-goes-on>.

Kellogg, Wilfred H. 1919. *Influenza: A Study of Measures Adopted for the Control of the Epidemic*. Sacramento, CA: California State Printing Office.

- Kelm, George L., and Amihai Mazar. 1982. "Three Seasons of Excavations at Tel Batash: Biblical Timnah." *Bull Am Schools Orient Res* 248:1-36. doi:10.2307/1356672.
- Keshavjee, Salmaan, Irina Y. Gelmanova, A. D. Pasechnikov, et al. 2008. "Treating Multidrug-Resistant Tuberculosis in Tomsk, Russia: Developing Programs That Address the Linkage Between Poverty and Disease." *Ann N Y Acad Sci* 1136:1-11. doi:10.1196/annals.1425.009.
- Kettles, Graeme J., and Estrella Luna. 2019. "Food Security in 2044: How Do We Control the Fungal Threat?" *Fungal Biol* 123(8):558-64. doi:10.1016/j.funbio.2019.04.006.
- Khaled, Amina, Minghui Zhang, Pierre Amato, et al. 2021. "Biodegradation by Bacteria in Clouds: An Underestimated Sink for Some Organics in the Atmospheric Multiphase System." *Atmos Chem Phys* 21(4):3123-41. doi:10.5194/acp-21-3123-2021.
- Khodadad, Christina L., Gregory M. Wong, Leandro M. James, et al. 2017. "Stratosphere Conditions Inactivate Bacterial Endospores from a Mars Spacecraft Assembly Facility." *Astrobiology* 17(4):337-50. doi:10.1089/ast.2016.1549.
- Killingley, Ben, Joanne E. Enstone, Jane Greatorex, et al. 2012. "Use of a Human Influenza Challenge Model to Assess Person-to-Person Transmission: Proof-of-Concept Study." *J Infect Dis* 205(1):35-43. doi:10.1093/infdis/jir701.
- Kim, E. T. 2020. "How South Korea Solved Its Face Mask Shortage." *New York Times*, April 1, 2020.
- Kim, Seungho, Hyunggon Park, Hope A. Gruszewski, et al. 2019. "Vortex-Induced Dispersal of a Plant Pathogen by Raindrop Impact." *Proc Natl Acad Sci U S A* 116(11):4917-22. doi:10.1073/pnas.1820318116.
- Kim, Sung-Han, So Y. Chang, Minki Sung, et al. 2016. "Extensive Viable Middle East Respiratory Syndrome (MERS) Coronavirus Contamination in Air and Surrounding Environment in MERS Isolation Wards." *Clin Infect Dis* 63(3):363-9. doi:10.1093/cid/ciw239.
- Kimball, Anne, Kelly M. Hatfield, Melissa Arons, et al. 2020. "Asymptomatic and Presymptomatic SARS-CoV-2 Infections in Residents of a Long-Term Care Skilled Nursing Facility—King County, Washington, March 2020." *Morb Mortal Wkly Rep* 69(13):377-81. doi:10.15585/mmwr.mm6913e1.
- King, Nicholas B. 2004. "The Scale Politics of Emerging Diseases." *Osiris* 19:62-76. doi:10.1086/649394.
- Kinzelbach, Annemarie. 2006. "Infection, Contagion, and Public Health in Late Medieval and Early Modern German Imperial Towns." *J Hist Med Allied Sci.* 61:369-89.
- Kirchhelle, Claas. 2018. "Pharming Animals: A Global History of Antibiotics in Food Production (1935–2017)." *Palgrave Commun* 4(1):96. doi:10.1057/s41599-018-0152-2.
- Kislev, Mordechai E. 1982. "Stem Rust of Wheat 3300 Years Old Found in Israel." *Science* 216(4549):993-4. doi:10.1126/science.216.4549.993.
- Kisskalt, Karl. 1948. *Max von Pettenkofer*. Stuttgart: Wissenschaftliche Verlagsanstalt.

Klauss, A. K., R. H. Tull, L. M. Roots, and J. R. Pfafflin. 2011. "History of the Changing Concepts in Ventilation Requirements." *ASHRAE* 53(2):34-43.

Klee, Ernst. 2001. *Deutsche Medizin Im Dritten Reich Karrieren Vor Und Nach 1945*. Frankfurt: S. Fischer.

Klein Melissa D., Michael Sciaudone, David Richardson, et al. 2022. "SARS-CoV-2 Seroprevalence and Risk Factors Among Meat Packing, Produce Processing, and Farm Workers." *PLOS Glob Public Health* 2(7):e0000619. doi:10.1371/journal.pgph.0000619.

Kleinman, Arthur, and James L. Watson. 2005. *SARS in China: Prelude to Pandemic?* Stanford, CA: Stanford University Press.

Klimpel, Volker. 2005. *Ärzte-Tode: Unnatürliches und Gewaltiges Ableben in Neun Kapiteln und Einem Biographischen Anhang*. Würzburg: Königshausen & Neumann.

Klompas, Michael, and Chanu Rhee. 2022. "Optimizing and Unifying Infection Control Precautions for Respiratory Viral Infections." *J Infect Dis* 226(2):191-4. doi:10.1093/infdis/jiac197.

Knapp, Charles W., Jan Dolfig, Phillip A. I. Ehlert, et al. 2010. "Evidence of Increasing Antibiotic Resistance Gene Abundances in Archived Soils Since 1940." *Environ Sci Technol* 44(2):580-7. doi:10.1021/es901221x.

Kobziar, Leda N, and George R. Thompson. 2020. "Wildfire Smoke, a Potential Infectious Agent." *Science* 370(6523):1408-10. doi:10.1126/science.abe8116.

—, David Vuono, Rachel Moore, et al. 2022. "Wildland Fire Smoke Alters the Composition, Diversity, and Potential Atmospheric Function of Microbial Life in the Aerobiome." *ISME Commun* 2(1):8. doi:10.1038/s43705-022-00089-5.

—, Phinehas Lampman, Ali Tohidi, et al. 2024. "Bacterial Emission Factors: A Foundation for the Terrestrial-Atmospheric Modeling of Bacteria Aerosolized by Wildland Fires." *Environ Sci Technol* 58(5):2413-22. doi:10.1021/acs.est.3c05142.

Koch, Robert. 1987. *Essays of Robert Koch*. Translated by K. C. Carter. New York, NY: Greenwood Press.

Koch, Tom. 2008. "John Snow, Hero of Cholera: RIP." *CMAJ* 178(13):1736. doi:10.1503/cmaj.080805.

Koenig, Sarah. 2001. "Dr. Richard L. Riley, 90, Hopkins Researcher." *Baltimore Sun*, December 20, 2001.

Koplow, David. 2008. "Losing the War on Bioterrorism." *Georgetown Security Law Commentary*, October 6, 2008.

<https://web.archive.org/web/20100402075346/www.securitylawbrief.com/commentary/2008/10/losing-the-war.html>.

Korecki, Natasha. 2020. "Biden Has Fought a Pandemic Before. It Did Not Go Smoothly." *Politico*, May 4, 2020. <https://www.politico.com/news/2020/05/04/joe-biden-contain-h1n1-virus-232992>.

- Korenaga, Jun. 2021. “Was There Land on the Early Earth?” *Life (Basel)* 11(11):1142. doi:10.3390/life11111142.
- Kormos, David, Kaisen Lin, Amy Pruden, et al. 2022. “Critical Review of Antibiotic Resistance Genes in the Atmosphere.” *Environ Sci Process Impacts* 24(6):870-83. doi:10.1039/d2em00091a.
- Kortepeter, Mark G. 2020. *Inside the Hot Zone: A Soldier on the Front Lines of Biological Warfare*. Lincoln, NE: Potomac Books.
- Kristensson, Krister. 1999. “The Discovery of the Poliovirus.” *Brain Res Bull* 50(5-6):461. doi:10.1016/S0361-9230(99)00134-3.
- Krumbein, Wolfgang E. 1995. “Gone with the Wind—A Second Blow Against Spontaneous Generation.” *Aerobiologia* 11:205-11. doi:10.1007/BF02450041.
- Kuznick, Peter J. 1987. *Beyond the Laboratory: Scientists as Political Activists in 1930s America*. Chicago, IL: University of Chicago Press.
- Labadie, Thomas, Christophe Batéjat, India Leclercq, et al. 2020. “Historical Discoveries on Viruses in the Environment and Their Impact on Public Health.” *Intervirology* 63(1-6):17-32. doi:10.1159/000511575.
- Lacey, Marc. 2005. “New Strain of Wheat Rust Appears in Africa.” *New York Times*, September 9, 2005.
- and Donald G. McNeil. 2009. “Fighting Deadly Flu, Mexico Shuts Schools.” *New York Times*, April 24, 2009.
- and Elisabeth Malkin. 2009a. “Mexico Takes Powers to Isolate Cases of Swine Flu.” *New York Times*, April 25, 2009.
- and Elisabeth Malkin. 2009b. “First Flu Death Provides Clues to Mexico Toll.” *New York Times*, April 30, 2009.
- Lagomarsino-Oneto, Daniele, Jacob J. Golan, Andrea Mazzino, et al. 2020. “Timing of Fungal Spore Release Dictates Survival During Atmospheric Transport.” *Proc Natl Acad Sci U S A* 117(10):5134-43. doi:10.1073/pnas.1913752117.
- Lai, Jianyu, Kristen K. Coleman, S. H. S. Tai, et al. 2023. “Exhaled Breath Aerosol Shedding of Highly Transmissible Versus Prior Severe Acute Respiratory Syndrome Coronavirus 2 Variants.” *Clin Infect Dis* 76(5):786-94. doi:10.1093/cid/ciac846.
- Land, Raymond J. 2014. “Prohibit Air Travel to Ebola-Infected Countries.” *Florida Today*, September 2, 2014. <https://www.floridatoday.com/story/opinion/readers/letters/2014/09/02/letters-editor-tuesday-sept/14904527>.
- Lang, Yan, and Hossein Moeini-Meybodi. 2021. “Wildfires—A Growing Concern for Sustainable Development.” *United Nations Department of Economic and Social Affairs*, September 1, 2021. https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB_111.pdf.

- Lang-Yona, Naama, J. M. Flores, Rotem Haviv, et al. 2022. “Terrestrial and Marine Influence on Atmospheric Bacterial Diversity Over the North Atlantic and Pacific Oceans.” *Commun Earth Environ* 3(1):121. doi:10.1038/s43247-022-00441-6.
- Langmuir, Alexander D. 1951. “The Potentialities of Biological Warfare Against Man—An Epidemiological Appraisal.” *Public Health Rep* 66(13):387-99. doi:10.2307/4587679.
- . 1961. “Epidemiology of Airborne Infection.” *Bacteriol Rev* 25(3):173-81. doi:10.1128/br.25.3.173-181.1961.
- . 1964. “Airborne Infection: How Important for Public Health?” *Am J Public Health Nations Health* 54(10):1666-8. doi:10.2105/ajph.54.10.1666.
- . 1980. “Changing Concepts of Airborne Infection of Acute Contagious Diseases: A Reconsideration of Classic Epidemiologic Theories.” *Ann N Y Acad Sci* 353(1):35-44. doi:10.1111/j.1749-6632.1980.tb18903.x.
- . 1987. “The Territory of Epidemiology: Pentimento.” *J Infect Dis* 155(3):349-58. doi:10.1093/infdis/155.3.349.
- and Justin M. Andrews. 1952. “Biological Warfare Defense.” *Am J Public Health Nations Health* 42(3):235-8. doi:10.2105/ajph.42.3.235.
- , Hollis S. Ingraham, Allen D. Brandt, et al. 1950. “Progress in the Control of Air-Borne Infections.” *Am J Public Health Nations Health* 40(5 Pt 2):82-8. doi:10.2105/ajph.40.5_pt_2.82.
- Lappan, Rachael, Jordan Thakar, Laura M. Moncayo, et al. 2024. “The Atmosphere: A Transport Medium or an Active Microbial Ecosystem?” *ISME J* 18(1):wrae092.
- Lau, Joseph T. F., Sian Griffiths, Kai-Chow Choi, Chunqing Lin. 2010. “Prevalence of Preventive Behaviors and Associated Factors During Early Phase of the H1N1 Influenza Epidemic.” *Am J Infect Control* 38(5):374-80. doi:10.1016/j.ajic.2010.03.002. doi:10.1093/ismejo/wrae092.
- Lawrence, Ken. 2005. *The World According to Trump: An Unauthorized Portrait in His Own Words*. Kansas City, MO: Andrews McMeel Pub.
- Lazarus, Jeffrey V., Diana Romero, Christopher J. Kopka, et al. 2022. “A Multinational Delphi Consensus to End the COVID-19 Public Health Threat.” *Nature* 611(7935):332-45. doi:10.1038/s41586-022-05398-2.
- League of Nations. 1925. *Proceedings of the Conference for the Supervision of the International Trade in Arms and Ammunition and Implements of War, Held at Geneva, May 4th to June 17th, 1925*. Lausanne.
- Lecerf, Jean-Michel. 2023. “Louis Pasteur à Lille: de la Chimie à la Microbiologie.” *Médecine des Maladies Métaboliques* 17(3):295-302. doi:10.1016/j.mmm.2023.01.008.
- Lederberg, Joshua. 1970. “Biological Goal: Human Welfare.” *New York Times*, January 12, 1970.
- . 1988a. “Medical Science, Infectious Disease, and the Unity of Humankind.” *JAMA* 260(5):684-5. doi:10.1001/jama.1988.03410050104039.

- . 1988b. “Pandemic as a Natural Evolutionary Phenomenon.” *Soc Res* 55(3):343-59. <https://www.jstor.org/stable/40970507>.
- . 1997. “Infectious Disease and Biological Weapons: Prophylaxis and Mitigation.” *JAMA* 278(5):435-6. doi:10.1001/jama.1997.03550050097042.
- Lee, Carole E., and Amie Parnes. 2009. “Biden Says Avoid Planes, Subways; Puts Out Clarifying Statement.” *Politico*, April 30, 2009. <https://www.politico.com/story/2009/04/biden-says-avoid-planes-subways-puts-out-clarifying-statement-021925>.
- Lee, Nelson, David Hui, Alan Wu, et al. 2003. “A Major Outbreak of Severe Acute Respiratory Syndrome in Hong Kong.” *N Engl J Med* 348(20):1986-94. doi:10.1056/NEJMoa030685.
- Leitenberg, Milton. 1999. “Aum Shinrikyo’s Efforts to Produce Biological Weapons: A Case Study in the Serial Propagation of Misinformation.” *Terror Political Violence* 11(4):149-58. doi:10.1080/09546559908427537.
- . 2009. “The Self-Fulfilling Prophecy of Bioterrorism.” *Nonproliferation Rev* 16(1):95-109. doi:10.1080/10736700802645676.
- , Raymond A. Zilinskas, and Jens H. Kuhn. 2012. *The Soviet Biological Weapons Program: A History*. Cambridge, MA: Harvard University Press.
- Lemelson-MIT Program. n.d. “Otto Lilienthal: Advances in Heavier-Than-Air-Flight Transportation.” <https://lemelson.mit.edu/resources/otto-lilienthal>.
- Lemieux, Camille, Gabrielle Brankston, Leah Gitterman, et al. 2007. “Questioning Aerosol Transmission of Influenza.” *Emerg Infect Dis* 13(1):173-5. doi:10.3201/eid1301.061202.
- Leonard, John. 1969. “Somebody in There Likes Us.” *New York Times*, June 26, 1969.
- Lewis, Dyani. 2020. “Is the Coronavirus Airborne? Experts Can’t Agree.” *Nature* 580(7802):175. doi:10.1038/d41586-020-00974-w.
- . 2022. “Why the WHO Took Two Years to Say COVID Is Airborne.” *Nature* 604(7904):26-31. doi:10.1038/d41586-022-00925-7.
- . 2023. “Indoor Air Is Full of Flu and COVID Viruses. Will Countries Clean It Up?” *Nature* 615(7951):206-8. doi:10.1038/d41586-023-00642-9.
- Li, Jing, Junji Cao, Yong-Guan Zhu, et al. 2018. “Global Survey of Antibiotic Resistance Genes in Air.” *Environ Sci Technol* 52(19):10975-84. doi:10.1021/acs.est.8b02204.
- Li, Ruiyun, Sen Pei, Bin Chen, et al. 2020a. “Substantial Undocumented Infection Facilitates the Rapid Dissemination of Novel Coronavirus (COVID-19).” *Science* 368(6490):489-93. doi:10.1126/science.abb3221.
- Li, Xixing, Weina Cui, and Fuzhen Zhang. 2020b. “Who Was the First Doctor to Report the COVID-19 Outbreak in Wuhan, China?” *J Nucl Med* 61(6):782-3. doi:10.2967/jnumed.120.247262.

- Li, Yuguo, Hua Qian, Jian Hang, et al. 2021. "Probable Airborne Transmission of SARS-CoV-2 in a Poorly Ventilated Restaurant." *Build Environ* 196:107788. doi:10.1016/j.buildenv.2021.107788.
- , Xinghua Huang, I. T. S. Yu, et al. 2005. "Role of Air Distribution in SARS Transmission During the Largest Nosocomial Outbreak in Hong Kong." *Indoor Air* 15(2):83-95. doi:10.1111/j.1600-0668.2004.00317.x.
- Liddicoat, Craig, Harrison Sydnor, Christian Cando-Dumancela, et al. 2020. "Naturally-Diverse Airborne Environmental Microbial Exposures Modulate the Gut Microbiome and May Provide Anxiolytic Benefits in Mice." *Sci Total Environ* 701:134684. doi:10.1016/j.scitotenv.2019.134684.
- Lidwell-Durnin, John, and Adam Laphorn. 2020. "The Threat to Global Food Security from Wheat Rust: Ethical and Historical Issues in Fighting Crop Diseases and Preserving Genetic Diversity." *Glob Food Sec* 26:100446. doi:10.1016/j.gfs.2020.100446.
- Lindbergh, Anne M. 1934. "Flying Around the North Atlantic." *National Geographic* 66:259-337.
- . 1974. *Locked Rooms and Open Doors*. New York, NY: Harcourt Brace Jovanovich.
- Lindbergh, Charles A. 1939. "Aviation, Geography, and Race." *Reader's Digest* 35(211):64-7.
- . 1978. *Autobiography of Values*. New York, NY: Harcourt Brace Jovanovich.
- Lippman, Daniel. 2019. "The Purell Presidency: Trump Aides Learn the President's Real Red Line." *Politico*, July 7, 2019. <https://www.politico.com/story/2019/07/07/donald-trump-germaphobe-1399258>.
- Liptak, Kevin. 2020. "Trump Taken to Walter Reed Medical Center and Will Be Hospitalized 'for the Next Few Days'." *CNN*, October 3, 2020. <https://www.cnn.com/2020/10/02/politics/president-donald-trump-walter-reed-coronavirus/index.html>.
- and Maeve Reston. 2020. "Trump Returns to White House and Removes Mask Despite Having Covid." *CNN*, October 5, 2020. <https://www.cnn.com/2020/10/05/politics/donald-trump-covid-condition-walter-reed/index.html>.
- Lister, Joseph. 1867. "On the Antiseptic Principle in the Practice of Surgery." *Br Med J* 2(351):246-8. doi:10.1136/bmj.2.351.246.
- . 1909. *The Collected Papers of Joseph Baron Lister, Volume 2*. Oxford: Clarendon Press.
- Locher, Wolfgang G. 2007. "Max von Pettenkofer (1818-1901) as a Pioneer of Modern Hygiene and Preventive Medicine." *Environ Health Prev Med* 12(6):238-45. doi:10.1007/BF02898030.
- Loeb, Mark, Nancy Dafoe, James Mahony, et al. 2009. "Surgical Mask Vs N95 Respirator for Preventing Influenza Among Health Care Workers: A Randomized Trial." *JAMA* 302(17):1865-71. doi:10.1001/jama.2009.1466.

- Logan, Niall A., Liesbeth Lebbe, An Verhelst, et al. 2002. “*Bacillus luciferensis* sp. nov., from Volcanic Soil on Candlemas Island, South Sandwich Archipelago.” *Int J Syst Evol Microbiol* 52(Pt 6):1985-9. doi:10.1099/00207713-52-6-1985.
- Lok, Corry. 2016. “Where Sneezes Go.” *Nature* 534(7605):24-6. doi:10.1038/534024a.
- Long, Carrie M., and Andrea Marzi. 2021. “Biodefence Research Two Decades on: Worth the Investment?” *Lancet Infect Dis* 21(8):e222-33. doi:10.1016/S1473-3099(21)00382-0.
- Lopata, Jim. 2013. “Club Cafe, Boston’s Gay Social Hub, Turns 30.” *Boston.com*, October 11, 2013.
https://web.archive.org/web/20180705081819/http://archive.boston.com/lifestyle/blogs/bostonspirit/2013/10/club_cafe_boston_gay_iconic_es.html.
- Lovelace Jr., Berkeley. 2021. “CDC Reverses Indoor Mask Policy, Saying Fully Vaccinated People and Kids Should Wear Them Indoors.” *CNBC*, July 27, 2021.
<https://www.cnn.com/2021/07/27/cdc-to-reverse-indoor-mask-policy-to-recommend-them-for-fully-vaccinated-people-in-covid-hot-spots.html>.
- , Tonya Bauer, and John Torres. 2022. “A Rare Look Inside the Strategic National Stockpile—and How It Went Wrong at the Start of the Pandemic.” *NBC News*, July 28, 2022.
<https://www.nbcnews.com/health/health-news/rare-look-strategic-national-stockpile-went-wrong-start-pandemic-rcna32603>.
- Lownes, Albert E. 1947. “Charles Darwin to Charles Harrison Blackley (An Early Chapter on Pollen Allergy).” *Isis* 37(107-108):21-4. doi:10.1086/347961.
- Lu, Jianyun, Jieni Gu, Kuibiao Li, et al. 2020. “COVID-19 Outbreak Associated with Air Conditioning in a Restaurant, Guangzhou, China, 2020.” *Emerg Infect Dis* 26(7):1628-31. doi:10.3201/eid2607.200764.
- Lucretius. 1924. *De Rerum Natura*. Cambridge, MA: Harvard University Press.
- Lukas, Max, Ralph Schwidetzky, Rosemary J. Eufemio, et al. 2022. “Toward Understanding Bacterial Ice Nucleation.” *J Phys Chem B* 126(9):1861-7. doi:10.1021/acs.jpcc.1c09342.
- Lurie, Max B. 1964. *Resistance to Tuberculosis: Experimental Studies in Native and Acquired Defensive Mechanism*. Cambridge, MA: Harvard University Press.
- Lyman, Lauren D. 1934. “Stratosphere Rite Uses Air, Not Wine.” *New York Times*, July 10, 1934.
- Lynteris, Christos. 2018. “Plague Masks: The Visual Emergence of Anti-Epidemic Personal Protection Equipment.” *Med Anthropol* 37(6):442-57. doi:10.1080/01459740.2017.1423072.
- . 2020. “Why Do People Really Wear Face Masks During an Epidemic?” *New York Times*, February 13, 2020.
- Ma, Yuxia, Jianding Zhou, Sixu Yang, Yuxin Zhao, and Xiaodong Zheng. 2017. “Assessment for the Impact of Dust Events on Measles Incidence in Western China.” *Atmos Environ* 157:1-9. doi:10.1016/j.atmosenv.2017.03.010.

Mabeus, Courtney. 2013. "Fort Detrick's Eight-Ball—A Relic of Cold War Bio-Warfare." *Frederick News-Post*, October 11, 2013.

Macdonald, Betty H. 1954. "Historic Landmarks of Delaware and the Eastern Shore: Pleasanton Abbey." *News Journal*, January 9, 1954.

Macdonald, Moira. 2020. "Carole Rae Woodmansee, Whose Life Centered on Family, Faith and Music, Dies at 81 of Coronavirus Complications." *Seattle Times*, April 25, 2020.

MacIntyre, C. R., Holly Seale, Tham C. Dung, et al. 2015. "A Cluster Randomised Trial of Cloth Masks Compared with Medical Masks in Healthcare Workers." *BMJ Open* 5(4):e006577. doi:10.1136/bmjopen-2014-006577.

Mack, Arien. 1988. "Editor's Introduction." *Social Research* 55(3):323-6. <http://www.jstor.org/stable/40970504>.

Maclean, Charles. 1824. *Evils of Quarantine Laws*. London: T. & G. Underwood.

MacPhail, Theresa. 2023. *Allergic: Our Irritated Bodies in a Changing World*. New York, NY: Random House.

Mallon, Paul. 1938. "Experts Connect Crash of Clipper to Scientists' Study of Microbes." *Philadelphia Inquirer*, September 7, 1938.

Manchester, K. L. 2007. "Louis Pasteur, Fermentation, and a Rival." *S Afr J Sci* 103(9):377-80. doi:10.10520/EJC96719.

Mandavilli, Apoorva. 2020a. "Infected but Feeling Fine: The Unwitting Coronavirus Spreaders." *New York Times*, March 31, 2020.

—. 2020b. "239 Experts with One Big Claim: The Coronavirus Is Airborne." *New York Times*, July 4, 2020.

Mangold, Hannes. 2019. "Switzerland from Above." *Swiss National Museum*, January 5, 2019. <https://blog.nationalmuseum.ch/en/2019/05/switzerland-from-above>.

Mann, Brian. 2020. "Trump Team Killed Rule Designed to Protect Health Workers from Pandemic Like COVID-19." *National Public Radio*, May 26, 2020. <https://www.npr.org/2020/05/26/862018484/trump-team-killed-rule-designed-to-protect-health-workers-from-pandemic-like-cov>.

Mann, Charles C. 2018. *The Wizard and the Prophet*. New York, NY: Alfred A. Knopf.

Mark-Carew, Miguella, Gloria Kang, Sanjana Pampati, et al. 2023. "Ventilation Improvements Among K-12 Public School Districts—United States, August-December 2022." *Morb Mortal Wkly Rep* 72(14):372-6. doi:10.15585/mmwr.mm7214a4.

Markel, Howard, Harvey B. Lipman, J. A. Navarro, et al. 2007. "Nonpharmaceutical Interventions Implemented by US Cities During the 1918-1919 Influenza Pandemic." *JAMA* 298(6):644-54. doi:10.1001/jama.298.6.644.

Marr, Linsey. 2021. "Testimony of Linsey C. Marr, Ph.D. Subcommittee on Workforce Protections, Committee on Education and Labor, United States House of Representatives."

March 11, 2021. <https://www.congress.gov/117/meeting/house/111290/witnesses/HHRG-117-ED10-Wstate-MarrPhDL-20210311.pdf>.

Marwick, Charles. 1989. "Scientists Ponder When, Why of Emerging Viruses." *JAMA* 262(1):16. doi:10.1001/jama.1989.03430010018008.

Mason, Charles F. 1917. *A Complete Handbook for the Sanitary Troops of the U.S. Army and Navy and National Guard and Naval Militia*. New York, NY: William Wood & Co.

Massachusetts Department of Public Health. 1935. "Annual Report of the Department of Public Health for the Year Ended November 30, 1934." <http://archives.lib.state.ma.us/handle/2452/782677>.

Mateus, Benjamin. 2023. "The History and Science Behind Airborne Infections and the Use of Ultraviolet Irradiation for Disinfecting Indoor Air." *World Socialist Web Site*, February 10, 2023. <https://www.wsws.org/en/articles/2023/02/11/xbxo-fl1.html>.

Matta, Christina. 2010. "Spontaneous Generation and Disease Causation: Anton de Bary's Experiments with *Phytophthora infestans* and Late Blight of Potato." *J Hist Biol* 43(3):459-91. doi:10.1007/s10739-009-9220-1.

Matter of Fact. 2018. "Dr. Fauci: A Universal Flu Vaccine Is Possible." *YouTube*, February 10, 2018. <https://www.youtube.com/watch?v=NdaYmgEmhQ0>.

Matthews, Curt, and Robert Adams. 1977. "FBI Tried to Hide Ties with Globe-Democrat." *St. Louis Post-Dispatch*, December 1, 1977.

Matthews, Kate, Timothy Cavagnaro, Philip Weinstein, et al. 2024. "Health by Design; Optimising Our Urban Environmental Microbiomes for Human Health." *Environ Res* 257:119226. doi:10.1016/j.envres.2024.119226.

Mauger, Craig. 2020. "Protesters, Some Armed, Enter Michigan Capitol in Rally Against Covid-19 Limits." *Detroit News*, April 30, 2020.

Mayol, Eva, Jesús M. Arrieta, Maria A. Jiménez, et al. 2017. "Long-Range Transport of Airborne Microbes Over the Global Tropical and Subtropical Ocean." *Nat Commun* 8(1):201. doi:10.1038/s41467-017-00110-9.

McAdie, Alexander. 1934. "The Discovery of the Stratosphere." *Bull Am Meteorol Soc* 15(6):174-7. <https://www.jstor.org/stable/26263254>.

McBride, David. 1987. "The Henry Phipps Institute, 1903-1937: Pioneering Tuberculosis Work with an Urban Minority." *Bull Hist Med* 61(1):78-97. <https://www.jstor.org/stable/44433664>.

McCarthy, Joseph R. 1950. "Communist Infiltration of the Scientific Profession." In *Congressional Record: Proceedings and Debates of the 81st Congress, Second Session, Volume 96, Part 18*. USGPO.

McCarthy, Simone, Linda Lew, William Zheng, et al. 2020. "Coronavirus: How Disease X, the Epidemic-in-Waiting, Erupted in China." *South China Morning Post*, February 27, 2020. <https://multimedia.scmp.com/infographics/news/china/article/3052721/wuhan-killer/index.html>.

- McDevitt, James J., Petros Koutrakis, Stephen T. Ferguson, et al. 2013. "Development and Performance Evaluation of an Exhaled-Breath Bioaerosol Collector for Influenza Virus." *Aerosol Sci Technol* 47(4):444-51. doi:10.1080/02786826.2012.762973.
- McEnaney, Laura. 2020. *Civil Defense Begins at Home*. Princeton, NJ: Princeton University Press.
- McFarland, Joseph. 1929. *The Epidemic of Yellow Fever in Philadelphia in 1793 and Its Influence Upon Benjamin Rush*. New York, NY: Medical Life Press.
- McHugh, F. D. 1936. "The Scientific American Digest." *Sci Am* 154(4):198-226. <https://www.jstor.org/stable/10.2307/26144770>.
- McKenna, Maryn. 2022a. "When Covid Came for Provincetown." *Wired*, June 14, 2022. <https://www.wired.com/story/provincetown-covid-delta-outbreak-response>.
- . 2022b. "Wildfire Smoke May Carry Deadly Fungi Long Distances." *Wired*, October 10, 2022. <https://www.wired.com/story/wildfire-smoke-may-carry-deadly-fungi-long-distances>.
- McKhann, Charles F., Adelbert Steeger, and Arthur P. Long. 1938. "Hospital Infections: A Survey of the Problem." *Am J Dis Child* 55(3):579-99. doi:10.1001/archpedi.1938.01980090127015.
- McKinley, Earl B. 1934. "Climate and Health." *Sci Monthly* 39(2):117-28. <http://www.jstor.org/stable/15779>.
- McLean, R. C. 1915. "The Ecology of the Maritime Lichens at Blakeney Point, Norfolk." *J Ecol* 3(3):129-48. doi:10.2307/2255383.
- . 1935. "Bacteriology of the Atmosphere." *Nature* 136:880-1. doi:10.1038/136880a0.
- . 1943. "Microbiology of the Air." *Nature* 152:258-9. doi:10.1038/152258a0.
- McNeil Jr., Donald G. 2009. "Unusual Strain of Swine Flu Is Found in People in 2 States." *New York Times*, April 24, 2009.
- Mead, Heather L., Daniel R. Kollath, Marcus D. Teixeira, et al. 2022. "Coccidioidomycosis in Northern Arizona: An Investigation of the Host, Pathogen, and Environment Using a Disease Triangle Approach." *mSphere* 7(5):e0035222. doi:10.1128/msphere.00352-22.
- Meier, Fred C. 1916. "Watermelon Stem-End Rot." *J Agric Res* 6(4):149-52.
- . 1924. *Extension Work in Plant Pathology, 1923*. USDA.
- . 1930. *The Plant Disease Situation*. USDA.
- . 1931. *Dividends from Barberry Eradication*. USDA.
- . 1933. "Seeking Plant Diseases Among the Clouds." *Progress* 1:11.
- . 1935. "Microorganisms in the Atmosphere of Arctic Regions." *Phytopathology* 25:27.
- . 1936a. "Collecting Microorganisms from Winds Above the Caribbean Sea." *Phytopathology* 26:102.

- . 1936b. “Effects of Conditions in the Stratosphere on Spores of Fungi.” *Natl Geogr Soc Stratosph Ser* 2:152-3.
- and Charles A. Lindbergh. 1935. “Collecting Microorganisms from the Arctic Atmosphere: With Field Notes and Material.” *Sci Monthly* 40(1):5-20. <https://www.jstor.org/stable/15761>.
- and W. L. Popham. 1932. “Progress in Barberry Eradications in 1932 and Summarized Results Covering the Period 1918-1932.” USDA/BPI.
- , John A. Stevenson, and Vera K. Charles. 1933. “Spores in the Upper Air.” *Phytopathology* 23:23.
- Meltzer, Martin I., Inger Damon, James W. LeDuc, et al. 2001. “Modeling Potential Responses to Smallpox as a Bioterrorist Weapon.” *Emerg Infect Dis* 7(6):959-69. doi:10.3201/eid0706.010607.
- Merck, George W. 1946. “Report to the Secretary of War: Biological Warfare.” *Mil Surg* 98:237-42.
- Meselson, Matthew, Jeanne Guillemin, Martin Hugh-Jones, et al. 1994. “The Sverdlovsk Anthrax Outbreak of 1979.” *Science* 266(5188):1202-8. doi:10.1126/science.7973702.
- Metcalfe, Neil. 2004. “The History of Woollsorters’ Disease: A Yorkshire Beginning with an International Future?” *Occup Med* 54(7):489-93. doi:10.1093/occmed/kqh115.
- Meyer, Marcel, James A. Cox, Matt D. T. Hitchings, et al. 2017. “Quantifying Airborne Dispersal Routes of Pathogens Over Continents to Safeguard Global Wheat Supply.” *Nat Plants* 3(10):780-6. doi:10.1038/s41477-017-0017-5.
- Miallier, Didier, Pierre Boivin, Catherine Deniel, et al. 2010. “The Ultimate Summit Eruption of Puy de Dôme Volcano (Chaîne Des Puys, French Massif Central) About 10,700 Years Ago.” *C R Geosci* 342(11):847-54. doi:10.1016/j.crte.2010.09.004.
- Michaels, David. 2020. “What Trump Could Do Right Now to Keep Workers Safe from the Coronavirus.” *Atlantic*, March 2, 2020. <https://www.theatlantic.com/ideas/archive/2020/03/use-ose-help-stem-covid-19-pandemic/607312>.
- and Jordan Barab. 2020. “The Occupational Safety and Health Administration at 50: Protecting Workers in a Changing Economy.” *Am J Public Health* 110(5):631-5. doi:10.2105/AJPH.2020.305597.
- , Emily A. Spieler, and Gregory R. Wagner. 2024. “U.S. Workers During the Covid-19 Pandemic: Uneven Risks, Inadequate Protections, and Predictable Consequences.” *BMJ* 384:e076623. doi:10.1136/bmj-2023-076623.
- Michaud, Jennifer M., Luke R. Thompson, Drishti Kaul, et al. 2018. “Taxon-Specific Aerosolization of Bacteria and Viruses in an Experimental Ocean-Atmosphere Mesocosm.” *Nat Commun* 9(1). doi:10.1038/s41467-018-04409-z.
- Milbank, Jeremiah, ed. 1932. *Poliomyelitis*. Baltimore, MD: Williams & Wilkins Co.

- Miller, Adam, and Erin Collins. 2021. "Top Canadian WHO Adviser Under Fire After Downplaying Airborne Threat of COVID-19." *CBC*, April 21, 2021. <https://www.cbc.ca/news/health/canada-doctor-world-health-organization-airborne-1.5994889>.
- Miller, Edgar G. 1930. "William J. Gies Fellowship in Biological Chemistry at Columbia University." *J Dent Res* 10(6):771-4. doi:10.1177/00220345300100060901.
- Miller, Judith. 2003. "Search for Hidden Arsenals in Iraq Yields Little Evidence." *New York Times*, April 4, 2003.
- and William J. Broad. 1998. "Exercise Finds U.S. Unable to Handle Germ War Threat." *New York Times*, April 26, 1998.
- , Stephen Engelberg, and William J. Broad. 2001a. *Germs: Biological Weapons and America's Secret War*. New York, NY: Simon & Schuster.
- , Stephen Engelberg, and William J. Broad. 2001b. "U.S. Germ Warfare Research Pushes Treaty Limits." *New York Times*, September 4, 2001.
- Miller, Shelly L. 2002. "Efficacy of Ultraviolet Irradiation in Controlling the Spread of Tuberculosis." *Centers for Disease Control and Prevention*, October 14, 2002. <https://stacks.cdc.gov/view/cdc/11285>.
- , William W. Nazaroff, Jose L. Jimenez, et al. 2021. "Transmission of SARS-CoV-2 by Inhalation of Respiratory Aerosol in the Skagit Valley Chorale Superspreading Event." *Indoor Air* 31(2):314-23. doi:10.1111/ina.12751.
- Milton, Donald. 1993. "Cotton Dust, Endotoxin, and Emphysema: A Reevaluation and Implications for Other Organic Dusts and Mists." *Semin Respir Crit Care Med* 14(3):226-33. doi:10.1055/s-2007-1006322.
- , M. P. Fabian, Benjamin J. Cowling, et al. 2013. "Influenza Virus Aerosols in Human Exhaled Breath: Particle Size, Culturability, and Effect of Surgical Masks." *PLoS Pathog* 9(3):e1003205. doi:10.1371/journal.ppat.1003205.
- , P. M. Glencross, and Michael D. Walters. 2000. "Risk of Sick Leave Associated with Outdoor Air Supply Rate, Humidification, and Occupant Complaints." *Indoor Air* 10(4):212-21. doi:10.1034/j.1600-0668.2000.010004212.x.
- Miquel, Pierre. 1883. *Les Organismes Vivants de L'Atmosphere*. Paris: Gauthier-Villars.
- Molteni, Megan. 2021. "The 60-Year-Old Scientific Screwup That Helped Covid Kill." *Wired*, May 13, 2021. <https://www.wired.com/story/the-teeny-tiny-scientific-screwup-that-helped-covid-kill>.
- Moon, John E. V. C. 1992. "Biological Warfare Allegations: The Korean War Case." *Ann N Y Acad Sci* 666(1):53-83. doi:10.1111/j.1749-6632.1992.tb38022.x.
- Morabia, Alfredo. 2024. *The Public Health Approach: Population Thinking from the Black Death to Covid-19*. Baltimore, MD: Johns Hopkins University Press.
- Morawska, Lidia. 2006. "Droplet Fate in Indoor Environments, or Can We Prevent the Spread of Infection?" *Indoor Air* 16(5):335-47. doi:10.1111/j.1600-0668.2006.00432.x.

— and Donald K. Milton. 2020. “It Is Time to Address Airborne Transmission of Coronavirus Disease 2019 (COVID-19).” *Clin Infect Dis* 71(9):2311-3. doi:10.1093/cid/ciaa939.

— and Junji Cao. 2020. “Airborne Transmission of SARS-CoV-2: The World Should Face the Reality.” *Environ Int* 139:105730. doi:10.1016/j.envint.2020.105730.

—, Giorgio Buonanno, Alex Mikszewski, et al. 2022. “The Physics of Respiratory Particle Generation, Fate in the Air, and Inhalation.” *Nat Rev Phys* 4(11):723-34. doi:10.1038/s42254-022-00506-7.

—, Graham R. Johnson, Zoran D. Ristovski, et al. 2009. “Size Distribution and Sites of Origin of Droplets Expelled from the Human Respiratory Tract During Expiratory Activities.” *J Aerosol Sci* 40(3):256-69. doi:10.1016/j.jaerosci.2008.11.002.

—, Joseph Allen, William Bahnfleth, et al. 2024. “Mandating Indoor Air Quality for Public Buildings.” *Science* 383:(6690):1418-20. doi:10.1126/science.adl0677.

—, Wendy Barron, and Jane Hitchins. 1999. “Experimental Deposition of Environmental Tobacco Smoke Submicrometer Particulate Matter in the Human Respiratory Tract.” *Am Ind Hyg Assoc J* 60(3):334-9. doi:10.1080/00028899908984450.

—, William Bahnfleth, Philomena M. Bluysen, et al. 2023. “Coronavirus Disease 2019 and Airborne Transmission: Science Rejected, Lives Lost. Can Society Do Better?” *Clin Infect Dis* 76(10):1854-9. doi:10.1093/cid/ciad068.

Morowitz, Harold, and Carl Sagan. 1967. “Life in the Clouds of Venus.” *Nature* 215(5107):1259-60. doi:10.1038/2151259a0.

Morris, Cindy E., Franz Conen, J. A. Huffman, et al. 2014. “Bioprecipitation: A Feedback Cycle Linking Earth History, Ecosystem Dynamics and Land Use Through Biological Ice Nucleators in the Atmosphere.” *Glob Change Biol* 20(2):341-51. doi:10.1111/gcb.12447.

Morse, Stephen S. 1991. “Emerging Viruses: Defining the Rules for Viral Traffic.” *Perspect Biol Med* 34(3):387-409. doi:10.1353/pbm.1991.0038.

—. 2004. “Factors and Determinants of Disease Emergence.” *Rev Sci Tech* 23(2):443-51. doi:10.20506/rst.23.2.1494.

— and Ann Schluederberg. 1990. “Emerging Viruses: The Evolution of Viruses and Viral Diseases.” *J Infect Dis* 162(1):1-7. doi:10.1093/infdis/162.1.1.

—, Richard L. Garwin, and Paula J. Olsiewski. 2006. “Next Flu Pandemic: What to Do Until the Vaccine Arrives?” *Science* 314(5801):929. doi:10.1126/science.1135823.

Moser, Michael R., Thomas R. Bender, Harold S. Margolis, et al 1979. “An Outbreak of Influenza Aboard a Commercial Airliner.” *Am J Epidemiol* 110(1):1-6. doi:10.1093/oxfordjournals.aje.a112781.

Mosk, Matthew. 2020. “George W. Bush in 2005: ‘If We Wait for a Pandemic to Appear, It Will Be Too Late to Prepare’.” *ABC News*, April 5, 2020. <https://abcnews.go.com/Politics/george-bush-2005-wait-pandemic-late-prepare/story?id=69979013>.

- Moulton, Forest R. 1941. "The Chicago Meeting of the American Association for the Advancement of Science." *Science* 94(2442):353-6. doi:10.1126/science.94.2442.353.
- , ed. 1942. *Aerobiology*. Washington, DC: American Association for the Advancement of Science.
- Mphaphlele, Matsie, Ashwin S. Dharmadhikari, Paul A. Jensen, et al. 2015. "Institutional Tuberculosis Transmission. Controlled Trial of Upper Room Ultraviolet Air Disinfection: A Basis for New Dosing Guidelines." *Am J Respir Crit Care Med* 192(4):477-84. doi:10.1164/rccm.201501-0060OC.
- Müller, Nestor L., Gaik C. Ooi, Pek L. Khong, et al. 2003. "Severe Acute Respiratory Syndrome: Radiographic and CT Findings." *Am J Roentgenol* 181(1):3-8. doi:10.2214/ajr.181.1.1810003.
- Mullett, Charles F. 1952. "Politics, Economics and Medicine: Charles Maclean and Anticontagion in England." *Osiris* 10:224-51.
- Mussap, Christian J. 2019. "The Plague Doctor of Venice." *Intern Med J* 49(5):671-6. doi:10.1111/imj.14285.
- Myatt, Theodore A., Sebastian L. Johnston, Zhengfa Zuo, et al. 2004. "Detection of Airborne Rhinovirus and Its Relation to Outdoor Air Supply in Office Environments." *Am J Respir Crit Care Med* 169(11):1187-90. doi:10.1164/rccm.200306-760OC.
- Nadler, Jeffrey P., Noya Galai, Neil Graham, et al. 1992. "Multidrug-Resistant Tuberculosis." *N Engl J Med* 327(16):1172-4. doi:10.1056/NEJM199210153271614.
- Nakayama, Don K. 2020. "Surgical Masks During the Influenza Pandemic of 1918-1920." *Am Surg* 86(6):557-9. doi:10.1177/0003134820933216.
- Nardell, Edward A. 2015. "Transmission and Institutional Infection Control of Tuberculosis." *Cold Spring Harb Perspect Med* 6(2):a018192. doi:10.1101/cshperspect.a018192.
- and Ruvandhi R. Nathavitharana. 2020. "Airborne Spread of SARS-CoV-2 and a Potential Role for Air Disinfection." *JAMA* 324(2):141-2. doi:10.1001/jama.2020.7603.
- , B. McInnis, and Richard L. Riley. 1988. "Ultraviolet Air Disinfection to Reduce Tuberculosis Transmission in a Shelter for the Homeless—Rationale, Installation, and Preliminary Results." *Am Rev Resp Dis* 137(Supplement):257.
- , B. McInnis, B. Thomas, et al. 1986. "Exogenous Reinfection with Tuberculosis in a Shelter for the Homeless." *N Engl J Med* 315(25):1570-5. doi:10.1056/NEJM198612183152502.
- , D. Welch, R. Hashmi, et al. 2023. "Dynamic Breathing Zone Dose Monitoring of Room Occupants: A New Approach to Demonstrating Safe and Effective Germicidal UV (GUV) Air Disinfection." *Am J Respir Crit Care Med* 207:A1834. doi:10.1164/ajrccm-conference.2023.207.1_MeetingAbstracts.A1834.
- , Michael D. Iseman, George Kubica, et al. 1992. "Multidrug-Resistant Tuberculosis." *N Engl J Med* 327(16):1172.

- , Scott J. Bucher, Philip W. Brickner, et al. 2008. “Safety of Upper-Room Ultraviolet Germicidal Air Disinfection for Room Occupants: Results from the Tuberculosis Ultraviolet Shelter Study.” *Public Health Rep* 123(1):52-60. doi:10.1177/003335490812300108.
- Nardin, Jane. 1999. “A Meeting on the Mer de Glace: Frankenstein and the History of Alpine Mountaineering.” *Women’s Writing* 6(3):441-9. doi:10.1080/09699089900200080.
- National Academies of Sciences, Engineering, and Medicine. 2020. *Rapid Expert Consultations on the Covid-19 Pandemic: March 14, 2020-April 8, 2020*. Washington, DC: National Academies Press.
- National Institute for Occupational Safety and Health. 1993. *NIOSH Recommended Guidelines for Personal Respiratory Protection of Workers in Health-Care Facilities Potentially Exposed to Tuberculosis*. Atlanta, GA: U.S. Department of Health & Human Services.
- . 1995. “Protect Yourself from Tuberculosis: A Respiratory Protection Guide for Health Care Workers.” *Centers for Disease Control and Prevention*, December 1995. <https://www.cdc.gov/niosh/docs/96-102/default.html>.
- National Research Council. 2011. *Review of the Scientific Approaches Used During the FBI’s Investigation of the 2001 Anthrax Letters*. Washington, DC: National Academies Press.
- Natural History Museum. 2013. “Ehrenberg, Christian Gottfried (1795-1876).” April 19, 2013. <https://plants.jstor.org/stable/history/10.5555/al.ap.person.bm000002341>.
- National Weather Service. n.d. “A Brief History of Upper-Air Observations.” <https://www.weather.gov/upperair/reqdahdr>.
- Naval School of Aviation Medicine. 1946. *Operation Everest*. Pensacola, FL: School of Aviation Medicine, U.S. Naval Station. <http://resource.nlm.nih.gov/35721900R>.
- Navarro, J. A., and Howard Markel, eds. 2016. “Providence, Rhode Island.” In *Influenza Encyclopedia*. <https://www.influenzaarchive.org/cities/city-providence.html>.
- Neff, Edwin. 1942. “Charge of the Light Brigade.” *Philadelphia Record*.
- Nelson, E. C. 1983. “David Moore, Miles J. Berkeley and Scientific Studies of Potato Blight in Ireland, 1845-1847.” *Arch Nat Hist* 11(2):249-61. doi:10.3366/anh.1983.11.2.249.
- and Jean B. Ristaino. 2011. “The Potato Late Blight Pathogen in Ireland, 1846: Reconnecting Irish Specimens with the Moore-Berkeley Correspondence.” *Arch Nat Hist* 38(2):356-9. doi:10.3366/anh.2011.0042.
- Nelson, Harry. 1992. “USA: Objections to Protective Respirators.” *Lancet* 340(8827):1088. doi:10.1016/0140-6736(92)93094-4.
- Nelson, Thurlow C. 1957. “Some Scientific Aids to the Oyster Industry.” *Am Sci* 45(4):301-32. <https://www.jstor.org/stable/27826951>.
- New School Center for Public Scholarship. 2016. “In Time of Plague: The History and Social Consequences of Lethal Epidemic Disease.” https://www.centerforpublicscholarship.org/single-post/_src1.

- Newcott, Bill. 2020. "The Birthplace of the Space Age Isn't Where You Think." *National Geographic*, September 22, 2020. <https://www.nationalgeographic.com/history/article/birthplace-space-age-not-where-you-think>.
- Ngabonziza, Jean C. S., Chloé Loiseau, Michael Marceau, et al. 2020. "A Sister Lineage of the *Mycobacterium tuberculosis* Complex Discovered in the African Great Lakes Region." *Nat Commun* 11(1):2917. doi:10.1038/s41467-020-16626-6.
- Nguyen-Van-Tam, Jonathan S., Ben Killingley, Joanne Enstone, et al. 2020. "Minimal Transmission in an Influenza A (H3N2) Human Challenge-Transmission Model Within a Controlled Exposure Environment." *PLoS Pathog* 6(7):e1008704. doi:10.1371/journal.ppat.1008704.
- Nicas, Mark. 1995. "Respiratory Protection and the Risk of *Mycobacterium tuberculosis* Infection." *Am J Ind Med* 27(3):317-33. doi:10.1002/ajim.4700270302.
- Nicoll, Angus, Andrea Ammon, Andrew Amato, et al. 2010. "Experience and Lessons from Surveillance and Studies of the 2009 Pandemic in Europe." *Public Health* 124(1):14-23. doi:10.1016/j.puhe.2009.12.001.
- Nie, Jing-Bao, Nanyan Guo, Mark Selden, et al. 2010. *Japan's Wartime Medical Atrocities*. London: Routledge.
- Nightingale, Florence. 1863. *Notes on Hospitals*. London: Longman, Green, Longman, Roberts, and Green.
- Nigro, Carmen. 2011. "History on the Half-Shell: The Story of New York City and Its Oysters." *New York Public Library*, June 2, 2011. <https://www.nypl.org/blog/2011/06/01/history-half-shell-intertwined-story-new-york-city-and-its-oysters>.
- Nishijima, Takanori, Koki Toyota, and Masami Mochizuki. 2005. "Predominant Culturable Bacillus Species in Japanese Arable Soils and Their Potential as Biocontrol Agents." *Microbes Environ* 20(1):61-8. doi:10.1264/jsme2.20.61.
- Nixon, Richard. 1969. "Statement on Chemical and Biological Defense Policies and Program." In *Public Papers of the Presidents: Richard M. Nixon, 1969*. <https://2001-2009.state.gov/documents/organization/90920.pdf>.
- Nutton, Vivian. 1990. "The Reception of Fracastoro's Theory of Contagion: The Seed That Fell Among Thorns?" *Osiris* 6:196-234. doi:10.1086/368701.
- O'Toole, Tara. 1999. "Smallpox: An Attack Scenario." *Emerg Infect Dis* 5(4):540-6. doi:10.3201/eid0504.990416.
- and Thomas V. Inglesby. 2001. "Epidemic Response Scenario: Decision Making in a Time of Plague." *Public Health Rep* 116(Suppl 2):92-103. doi:10.1016/S0033-3549(04)50150-4.
- , Michael Mair, and Thomas V. Inglesby. 2002. "Shining Light on 'Dark Winter'." *Clin Infect Dis* 34(7):972-83. doi:10.1086/339909.
- Obama, Barack. 2020. *A Promised Land*. New York, NY: Crown.

- Office of Chief of Counsel for War Crimes. 1946a. "Affidavit Concerning Joachim Mrugowsky's Political and Medical Career." November 7, 1946.
<https://nuremberg.law.harvard.edu/documents/1912-affidavit-concerning-joachim-mrugowskys>.
- . 1946b. "Interrogations of Waldemar Hoven Concerning Buchenwald." October 22, 1946.
<https://nuremberg.law.harvard.edu/documents/2434-interrogations-of-waldemar-hoven>.
- Ofit, Paul A. 2007. *Vaccinated: One Man's Quest to Defeat the World's Deadliest Diseases*. New York, NY: HarperCollins.
- Ogawa, Mariko. 2000. "Uneasy Bedfellows: Science and Politics in the Refutation of Koch's Bacterial Theory of Cholera." *Bull Hist Med* 74(4):671-707. doi:10.1353/bhm.2000.0193.
- Olmstead, Alan L. and Paul W. Rhode. 2002. "The Red Queen and the Hard Reds: Productivity Growth in American Wheat, 1800-1940." *J Econ Hist* 62(4):929-66.
doi:10.1017/S0022050702001602.
- Olorunnipa, Toluse, Seung M. Kim, and Scott Wilson. 2020. "Trump Calls on Americans to Avoid Gatherings as Coronavirus Threatens to Afflict Country for Months." *Washington Post*, March 16, 2020.
- On the Media. 2021. "A Five-Micron Mistake."
<https://www.wnycstudios.org/podcasts/otm/segments/five-micron-mistake>.
- Ooi, Gaik C., and Daqing Ma. 2003. "SARS: Radiological Features." *Respirology* 8:S15-9.
doi:10.1046/j.1440-1843.2003.00519.x.
- Orchard, W. J. 1919. "Motor-Truck-Mounted Water Purification Units." *J Am Water Works Assoc* 6(3):562-71. <https://www.jstor.org/stable/41225117>.
- Orton, William A., and Fred C. Meier. 1922. *Diseases of Watermelons*. USGPO.
- Oshitani, Hitoshi. 2022. "COVID Lessons from Japan: Clear Messaging Is Key." *Nature* 605:589.
- Ostergren, Jack. 1964. "Man Mobbed by Multitudes of Microbes." *Oregonian*, April 3, 1964.
- Osterholm, Michael T. 2014. "What We're Afraid to Say About Ebola." *New York Times*, September 11, 2014.
- Ou, Cuiyun, Shixiong Hu, Kaiwei Luo, et al. 2022. "Insufficient Ventilation Led to a Probable Long-Range Airborne Transmission of SARS-CoV-2 on Two Buses." *Build Environ* 207:108414. doi:10.1016/j.buildenv.2021.108414.
- Our World in Data. 2024. "Estimated Cumulative Excess Deaths During COVID-19, World."
<https://ourworldindata.org/grapher/excess-deaths-cumulative-economist-single-entity?time=earliest.2023-05-05&facet=metric>.
- Owen, Russell. 1933. "The Lindberghs: Bold Flying Partners." *New York Times*, July 7, 1933.
- Paget, John, Peter Spreuwenberg, Vivek Charu, et al. 2019. "Global Mortality Associated with Seasonal Influenza Epidemics: New Burden Estimates and Predictors from the GLaMOR Project." *J Glob Health* 9(2):020421. doi:10.7189/jogh.09.020421.

- Palmer, Morgan E. 2018. "A Blight on the Pax Augusta: The Robigalia in Ovid's Fasti." *Classical World* 111(4):503-23. doi:10.1353/clw.2018.0038.
- Parker, Ashley, and Josh Dawsey. 2021. "Seven Days: Following Trump's Coronavirus Trail." *Washington Post*, December 5, 2021.
- Parker, Robert. 1983. *Miasma: Pollution and Purification in Early Greek Religion*. Oxford: Clarendon Press.
- Parker-Pope, Tara. 2009. "With Soap and Water or Sanitizer, a Cleaning That Can Stave Off the Flu." *New York Times*, September 14, 2009.
- Pasteur, Louis. 1864. "Des Generations Spontanees: Conference Fait Aux 'Soiree Scientifique de la Sorbonne' le 7 Aviril 1864." *Revue des Cours Scientifiques* 1:257-65.
- . 1922. *Oeuvres de Pasteur: Réunies par Pasteur Vallery-Radot*. Paris: Masson.
- . 1940. *Correspondance de Pasteur 1840-1895: Réunie et Annotée*. Paris: Flammarion.
- Pastoret, Paul-Pierre, Kazuya Yamanouchi, Uwe Mueller-Doblies, et al. 2006. "Rinderpest—an Old and Worldwide Story: History to c. 1902." In *Rinderpest and Peste des Petits Ruminants*, 86–VI. Elsevier.
- Patranobis, Sutirtho. 2020. "Doctor Who Treated First 7 Coronavirus Patients in Wuhan Now a Hero in China." *Hindustan Times*, February 2, 2020. <https://www.hindustantimes.com/india-news/doctor-who-treated-first-nts-in-wuhan-now-a-hero-in-china/story-hUvQxiFVaDa8lfQMn9YSdK.html>.
- PBS Newshour. 2020. "What Dr. Fauci Wants You to Know About Face Masks and Staying Home as Virus Spreads." April 3, 2020. <https://www.pbs.org/newshour/show/what-dr-fauci-wants-you-to-know-about-face-masks-and-staying-home-as-virus-spreads>.
- Peacock, Thomas B. 1848. *On the Influenza, or Epidemic Catarrhal Fever of 1847-8*. London: John Churchill.
- Pear, Robert. 2005. "Bush Budget Calls for Cuts in Health Services." *New York Times*, February 5, 2005.
- Péguilhan, Raphaëlle, Florent Rossi, Olivier Rué, et al. 2023. "Comparative Analysis of Bacterial Diversity in Clouds and Aerosols." *Atmos Environ* 298(13):119635. doi:10.1016/j.atmosenv.2023.119635.
- Peiris, Joseph S. M., Kwok Y. Yuen, Albert D. M. E. Osterhaus, et al. "The Severe Acute Respiratory Syndrome." *N Eng J Med* 349(25):2431-41. doi:10.1056/NEJMra032498.
- Pendergraft, Matthew A., Derek J. Grimes, Sarah N. Giddings, et al. 2023. "Bacterial and Chemical Evidence of Coastal Water Pollution from the Tijuana River in Sea Spray Aerosol." *Environ Sci Technol* 57(10):4071-81. doi:10.1021/acs.est.2c02312.
- Pengelly, Martin. 2021. "Trump Tested Positive for Covid Few Days Before Biden Debate, Chief of Staff Says in New Book." *Guardian*, December 1, 2021.

- Pepperell, Caitlin S. 2022. "Evolution of Tuberculosis Pathogenesis." *Annu Rev Microbiol* 76:661-80. doi:10.1146/annurev-micro-121321-093031.
- Pérez-Cobas, Ana E., Jerónimo Rodríguez-Beltrán, Fernando Baquero, et al. 2023. "Ecology of the Respiratory Tract Microbiome." *Trends Microbiol* 31(9):972-84. doi:10.1016/j.tim.2023.04.006.
- Perkins, James E. 1945. "Evaluation of Methods to Control Air-Borne Infections." *Am J Public Health Nations Health* 35(9):891-7. doi:10.2105/ajph.35.9.891.
- , Anne M. Bahlke, and Hilda F. Silverman. 1947. "Effect of Ultra-Violet Irradiation of Classrooms on Spread of Measles in Large Rural Central Schools: Preliminary Report." *Am J Public Health Nations Health* 37(5):529-37.
- Permutt, Solbert. 2002. "Richard Lord Riley, 1911-2001: An Appreciation." *Am J Respir Crit Care Med* 166(3):257. doi:10.1164/rccm.2205025.
- Peterson, P. D. 2013. "'The Barberry or Bread': The Public Campaign to Eradicate Common Barberry in the United States in the Early 20th Century." *APS Features*. doi:10.1094/APSFeature-2013-08.
- Petersen, Wolfgang (Director). 1995. *Outbreak*. Arnold Kopelson Productions.
- Pfeiffer, David A. 2017. "'Tony's Lab': Germ Warfare in WWI Used on Horses in the U.S." *Prologue Magazine* 49(3).
- Pfeiffer, Richard. 1892. "The Influenza Baccilus. I.—Preliminary Communication on the Exciting Causes of Influenza." *Br Med J* 1(1620):128. doi:10.1136/bmj.1.1620.128.
- Phair, John J. 1955. "Airborne Contagion and Air Hygiene." *Am J Public Health Nations Health* 45(11):1495-6. doi:10.2105/AJPH.45.11.1495-c.
- Piccard, Auguste. 1931. "Piccard Tells His Story of Trip to Stratosphere; Escaped Death Narrowly." *New York Times*, May 30, 1931.
- Pincus, Sol, and Arthur C. Stern. 1937. "A Study of Air Pollution in New York City." *Am J Public Health Nations Health* 27(4):321-33. doi:10.2105/ajph.27.4.321.
- Pinkowski, Jen. 2022. "The 1918 Pandemic Mistake That Changed Medicine Forever." *National Geographic*, March 21, 2022. <https://www.nationalgeographic.com/science/article/the-1918-pandemic-mistake-that-changed-medicine-forever>.
- Pollitzer, Robert, Satya Swaroop, and William Burrows. 1959. "Cholera." *Monogr Ser World Health Organ* 58(43):1001-19.
- Pope, Virginia. 1924. "Culture of Oysters Is Aimed at Saving an Old Industry." *New York Times*, July 27, 1924.
- Port, Kenneth L. 2014. *Deciphering the History of Japanese War Atrocities*. Durham, NC: Carolina Academic Press.
- Poupard, James A., and Linda A. Miller. 1992. "History of Biological Warfare: Catapults to Capsomeres." *Ann N Y Acad Sci* 666:9-20. doi:10.1111/j.1749-6632.1992.tb38020.x.

- Powell, Colin. 2003. "A Policy of Evasion and Deception." *Washington Post*, February 5, 2003.
- Prank, Marje, Shawn C. Kenaley, Gary C. Bergstrom, et al. 2019. "Climate Change Impacts the Spread Potential of Wheat Stem Rust, a Significant Crop Disease." *Environ Res Lett* 14(12):124053. doi:10.1088/1748-9326/ab57de.
- Prather, Kimberly A., Timothy H. Bertram, Vicki H. Grassian, et al. 2013. "Bringing the Ocean Into the Laboratory to Probe the Chemical Complexity of Sea Spray Aerosol." *Proc Natl Acad Sci* 110(19):7550-5. doi:10.1073/pnas.1300262110.
- Prather, Kimberly A., Chia C. Wang, and Robert T. Schooley. 2020. "Reducing Transmission of SARS-CoV-2." *Science* 368(6498):1422-4. doi:10.1126/science.abc6197.
- Pratt, Arthur H. 1919. "Water Supply for a Field Army." *Professional Memoirs* 11(60):730-41. <http://www.jstor.org/stable/10.2307/44534954>.
- Preston, Richard. 1992. "Crisis in the Hot Zone." *New Yorker*, October 18, 1992. <https://www.newyorker.com/magazine/1992/10/26/crisis-in-the-hot-zone>.
- . 1994. *The Hot Zone: A Terrifying New Story*. New York, NY: Anchor.
- Prillaman, McKenzie. 2022. "How Much Virus Does a Person with COVID Exhale? New Research Has Answers." *Nature* 609(7925):23. doi:10.1038/d41586-022-02202-z.
- Pringle, Peter. 1998. "A Deadly Cloud of Paranoia Drifts Across the US." *Independent*, December 20, 1998.
- Probandt, David, Thilo Eickhorst, Andreas Ellrott, et al. 2018. "Microbial Life on a Sand Grain: From Bulk Sediment to Single Grains." *ISME J* 12(2):623-33. doi:10.1038/ismej.2017.197.
- Prussin, Aaron J., Ellen B. Garcia, and Linsey C. Marr. 2015. "Total Concentrations of Virus and Bacteria in Indoor and Outdoor Air." *Environ Sci Technol Lett* 2(4):84-8. doi:10.1021/acs.estlett.5b00050.
- Qian, Hua, Te Miao, Li Liu, et al. 2021. "Indoor Transmission of SARS-CoV-2." *Indoor Air* 31(3):639-45. doi:10.1111/ina.12766.
- Quail, John. 1978. *The Slow Burning Fuse*. London: Paladin.
- Quammen, David. 2012. *Spillover: Animal Infections and the Next Human Pandemic*. New York, NY: W. W. Norton & Co.
- Quinnipiac University Poll. 2023. "Americans on Biden's Handling of Classified Documents: Inappropriate & Serious, But Shouldn't Face Charges, Quinnipiac University National Poll Finds; Biden Handling of the Mexican Border Hits Record Low While Majority Back His New Immigration Plan." January 18, 2023. <https://poll.qu.edu/poll-release?releaseid=3864>.
- Rader, Karen A. 2006. "Alexander Hollaender's Postwar Vision for Biology: Oak Ridge and Beyond." *J Hist Biol* 39(4):685-706. <https://www.jstor.org/stable/29737445>.
- Radosevich, Jennifer L., Wendy J. Wilson, Joseph H. Shinn, et al. 2002. "Development of a High-Volume Aerosol Collection System for the Identification of Air-Borne Micro-Organisms." *Lett Appl Microbiol* 34(3):162-7. doi:10.1046/j.1472-765x.2002.01048.x.

- Randall, Kevin, E. T. Ewing, Linsey C. Marr, et al. 2021. “How Did We Get Here: What Are Droplets and Aerosols and How Far Do They Go? A Historical Perspective on the Transmission of Respiratory Infectious Diseases.” *Interface Focus* 11(6):20210049. doi:10.1098/rsfs.2021.0049.
- Raskin, Sam. 2018. “The Mooch Came to NYU and It Went About How You Would Expect.” *Medium*, April 6, 2018. <https://nyulocal.com/the-mooch-came-to-nyu-and-it-went-about-how-you-would-expect-a6f7508a6a6d>.
- Ratcliffe, Herbert L. 1946. “Tuberculosis in Captive Wild Birds: Decrease of Its Incidence Following a Change in Diets.” *Am Rev Tuberc* 54(4-5):389-400. doi:10.1164/art.1946.54.4-5.389.
- Ray Film Industries. 1952. “What You Should Know About Biological Warfare.” https://archive.org/details/0826_What_You_Should_Know_About_Biological_Warfare_E01670_10_46_09_00.
- Read, Richard. 2020a. “A Choir Decided to Go Ahead with Rehearsal. Now Dozens of Members Have COVID-19 and Two Are Dead.” *Los Angeles Times*, March 29, 2020.
- . 2020b. “Scientists Challenge WHO on Viral Spread.” *Los Angeles Times*, July 4, 2020.
- Reed, Douglas S., Aysegul Nalca, and Chad J. Roy. 2018. “Aerobiology: History, Development, and Programs.” In *Medical Aspects of Biological Warfare*. Edited by Zygmunt F. Dembek. Washington, DC: Walter Reed Army Medical Center.
- Reed, Nicholas G. 2010. “The History of Ultraviolet Germicidal Irradiation for Air Disinfection.” *Public Health Rep* 125(1):15-27. doi:10.1177/003335491012500105.
- Rees, Paula, and Larry Eisenbach. 2020. “Ask Why: Sara Little Turnbull.” *Design Museum Foundation*, 2020. <https://designmuseumfoundation.org/ask-why>.
- Regis, Ed. 1999. *The Biology of Doom: The History of America’s Secret Germ Warfare Project*. New York, NY: Henry Holt & Co.
- Reichert, Felix, Oliver Stier, Anne Hartmann, et al. 2022. “Analysis of Two Choir Outbreaks Acting in Concert to Characterize Long-Range Transmission Risks Through SARS-CoV-2, Berlin, Germany, 2020.” *PLoS One* 17(11):e0277699. doi:10.1371/journal.pone.0277699.
- Reichhardt, Tony. 2016. “The Last Words of Otto Lilienthal.” *Smithsonian Magazine*, August 10, 2016. <https://www.smithsonianmag.com/air-space-magazine/last-words-otto-lilienthal-180960084>.
- Reimering, Susanne, Sebastian Muñoz, and Alice C. McHardy. 2020. “Phylogeographic Reconstruction Using Air Transportation Data and Its Application to the 2009 H1N1 Influenza A Pandemic.” *PLoS Comp Biol* 16(2):e1007101. doi:10.1371/journal.pcbi.1007101.
- Reinhard, Beth, and Emma Brown. 2020. “Face Masks in National Stockpile Have Not Been Substantially Replenished Since 2009.” *Washington Post*, March 10, 2020.
- Rensberger, Boyce. 1979. “Elvin Charles Stakman, 93, Dies; Authority on Diseases of Wheat.” *New York Times*, January 24, 1979.

- Reyes, Emily A. 2022. "This DIY Box Helps Clear Indoor Air of the Coronavirus. Why Aren't More People Using Them?" *Los Angeles Times*, July 31, 2022.
- Richmond, Phyllis A. 1954. "American Attitudes Toward the Germ Theory of Disease (1860-1880)." *J Hist Med Allied Sci* 9(4):428-54. doi:10.1093/jhmas/ix.4.428.
- Richtel, Matt. 2020. "Frightened Doctors Face Off with Hospitals Over Rules on Protective Gear." *New York Times*, March 31, 2020.
- Riley, Edward C. 1980a. "A Tribute to William Firth Wells." *Ann N Y Acad Sci* 353(1):81-2. doi:10.1111/j.1749-6632.1980.tb18909.x.
- . 1980b. "The Role of Ventilation in the Spread of Measles in an Elementary School." *Ann N Y Acad Sci* 353(1):25-34. doi:10.1111/j.1749-6632.1980.tb18902.x.
- , Gaël Murphy, and Richard L. Riley. 1978. "Airborne Spread of Measles in a Suburban Elementary School." *Am J Epidemiol* 107(5):421-32. doi:10.1093/oxfordjournals.aje.a112560.
- Riley, Richard L. 1957. "Aerial Dissemination of Pulmonary Tuberculosis." *Am Rev Tuberc* 76(6):931-41. doi:10.1164/artpd.1957.76.6.931.
- . 1959. "Protective Measures; Reasonable or Ritualistic." *Nursing Outlook* 7(1):38-9.
- . 1960. "Air-Borne Infections." *Am J Nurs* 60(9):1246-8. doi:10.2307/3418365.
- . 1974. "Airborne Infection." *Am J Med* 57(3):466-75. doi:10.1016/0002-9343(74)90140-5.
- . 1976. "Rising Tuberculosis Rate in Baltimore City." *Am Rev Respir Dis* 113(5):577-8. doi:10.1164/arrd.1976.113.5.577.
- . 1977. "Ultraviolet Air Disinfection for Protection Against Influenza." *Johns Hopkins Med J* 140(1):25-7.
- . 1980a. "Airborne Contagion: Historical Background." *Ann N Y Acad Sci* 353(1):3-9. doi:10.1111/j.1749-6632.1980.tb18900.x.
- . 1980b. "Airborne Transmission of Chickenpox." *N Engl J Med* 303(5):281-2. doi:10.1056/NEJM198007313030513.
- . 1980c. "The Changing Scene in Tuberculosis." In *Pulmonary Disease*. Edited by Alfred P. Fishman. New York, NY: McGraw-Hill.
- . 1988. "Ultraviolet Air Disinfection for Control of Respiratory Contagion." In *Architectural Design and Indoor Microbial Air Pollution*. Edited by Ruth B. Kundsin. Oxford: Oxford University Press.
- . 2001. "What Nobody Needs to Know About Airborne Infection." *Am J Respir Crit Care Med* 163(1):7-8. doi:10.1164/ajrccm.163.1.hh11-00.
- and Edward A. Nardell. 1989. "Clearing the Air: The Theory and Application of Ultraviolet Air Disinfection." *Am Rev Respir Dis* 139(5):1286-94. doi:10.1164/ajrccm/139.5.1286.
- and Francis O'Grady. 1961. *Airborne Infection: Transmission and Control*. New York, NY: Macmillan.

- and James E. Kaufman. 1971. “Air Disinfection in Corridors by Upper Air Irradiation with Ultraviolet.” *Arch Environ Health* 22(5):551-3. doi:10.1080/00039896.1971.10665899.
- and Solbert Permutt. 1971. “Room Air Disinfection by Ultraviolet Irradiation of Upper Air.” *Arch Environ Health* 22(2):208-19. doi:10.1080/00039896.1971.10665834.
- , Cretyl C. Mills, Francis O’Grady, et al. 1962. “Infectiousness of Air from a Tuberculosis Ward. Ultraviolet Irradiation of Infected Air: Comparative Infectiousness of Different Patients.” *Am Rev Respir Dis* 85(4):511-25. doi:10.1164/arrd.1962.85.4.511.
- , Cretyl C. Mills, Walenty Nyka, et al. 1959. “Aerial Dissemination of Pulmonary Tuberculosis: A Two-Year Study of Contagion in a Tuberculosis Ward.” *Am J Epidemiol* 70(2):185-96. doi:10.1093/oxfordjournals.aje.a120069.
- , Melton W. Knight, and Gardner Middlebrook. 1976. “Ultraviolet Susceptibility of BCG and Virulent Tubercle Bacilli.” *Am Rev Respir Dis* 113(4):413-8. doi:10.1164/arrd.1976.113.4.413.
- , William F. Wells, Cretyl C. Mills, et al. 1957. “Air Hygiene in Tuberculosis: Quantitative Studies of Infectivity and Control in a Pilot Ward.” *Am Rev Tuberc* 75(3):420-31. doi:10.1164/artpd.1957.75.3.420.
- Rimington, William R., Jeffrey G. Duckett, Katie J. Field, et al. 2020. “The Distribution and Evolution of Fungal Symbioses in Ancient Lineages of Land Plants.” *Mycorrhiza* 30(1):23-49. doi:10.1007/s00572-020-00938-y.
- Rimington, Anthony. 2018. *Stalin’s Secret Weapon: The Origins of Soviet Biological Warfare*. Oxford: Oxford University Press.
- Ristovski, Zoran D., Lidia Morawska, Jane Hitchins, et al. 2000. “Particle Emissions From Compressed Natural Gas Engines.” *J Aerosol Sci* 31(4):403-13.
- Ritchie, Hannah, Pablo Rosado, and Max Roser. 2019. “Meat and Dairy Production.” *Our World In Data*. <https://ourworldindata.org/meat-production>.
- Robertson, Lesley A. 2022. “The Vanishing Link Between Animalcules and Disease Before the 19th Century.” *FEMS Microbiol Lett* 369(1):fnac022. doi:10.1093/femsle/fnac022.
- Robertson, Oswald H. 1943. “Air-Borne Infection.” *Science* 97(2527):495-502. doi:10.1126/science.97.2527.495.
- , Clayton G. Loosli, Theodore T. Puck, et al. 1941a. “The Protection of Mice Against Infection with Air-Borne Influenza Virus by Means of Propylene Glycol Vapor.” *Science* 94(2452):612-3. doi:10.1126/science.94.2452.612.
- , Edward Bigg, Benjamin F. Miller, et al. 1941b. “Sterilization of Air by Certain Glycols Employed as Aerosols.” *Science* 93(2409):213-4. doi:10.1126/science.93.2409.213.
- , Morton Hamburger, and Clayton G. Loosli. 1944. “A Study of the Nature and Control of Air-Borne Infection in Army Camps.” *JAMA* 126(16):993-1000. doi:10.1001/jama.1944.02850510001001.
- Robinson, Jake M., and Martin F. Breed. 2023. “The Aerobiome-Health Axis: A Paradigm Shift in Bioaerosol Thinking.” *Trends Microbiol* 31(7):661-4. doi:10.1016/j.tim.2023.04.007.

- , Christian Cando-Dumancela, Rachael E. Antwis, et al. 2021. “Exposure to Airborne Bacteria Depends Upon Vertical Stratification and Vegetation Complexity.” *Sci Rep* 11(1):9516. doi:10.1038/s41598-021-89065-y.
- , Martin F. Breed, and Richard Beckett. 2024. “Probiotic Cities: Microbiome-Integrated Design for Healthy Urban Ecosystems.” *Trends Biotechnol* 42(8):942-945. doi:10.1016/j.tibtech.2024.01.005.
- Robinson, Julian P. 1998. “The Impact of Pugwash on the Debates Over Chemical and Biological Weapons.” *Ann N Y Acad Sci* 866:224-52. doi:10.1111/j.1749-6632.1998.tb09155.x.
- Rogers, Adam. 2020. “Could a Janky, Jury-Rigged Air Purifier Help Fight Covid-19?” *Wired*, August 6, 2020. <https://www.wired.com/story/could-a-janky-jury-rigged-air-purifier-help-fight-covid-19>.
- Rogers, Lore A., and Fred C. Meier. 1936. “The Collection of Micro-Organisms Above 36,000 Feet.” *Natl Geogr Soc Stratosph Ser* 2:146-51.
- Rogers, Paul, Simon Whitby, and Malcolm Dando. 1999. “Biological Warfare Against Crops.” *Sci Am* 280(6):70-5. doi:10.1038/scientificamerican0699-70.
- Roll-Hansen, Nils. 1979. “Experimental Method and Spontaneous Generation: The Controversy Between Pasteur and Pouchet, 1859-64.” *J Hist Med Allied Sci* 34(3):273-92. doi:10.1093/jhmas/XXXIV.3.273.
- Roper, Marcus and Agnese Seminara. 2019. “Mycofluidics: The Fluid Mechanics of Fungal Adaptation.” *Annu Rev Fluid Mech* 51(1):511-38. doi:10.1146/annurev-fluid-122316-045308.
- , Agnese Seminara, M. M. Bandi, et al. 2010. “Dispersal of Fungal Spores on a Cooperatively Generated Wind.” *Proc Natl Acad Sci U S A* 107(41):17474-9. doi:10.1073/pnas.1003577107.
- Rose, Christopher. 2020. “A Tale of Two Contagions: Science, Imperialism, and the 1883 Cholera in Egypt.” *Islamic Law Blog*, May 25, 2020. <https://islamiclaw.blog/2020/05/25/christopher-s-rose>.
- Rosebury, Aaron. 1973. “Eleanor, Daughter of Karl Marx: Personal Reminiscences.” *Monthly Rev* 24(8):29. doi:10.14452/mr-024-08-1973-01_3.
- Rosebury, Theodor. 1940. “Biological Research After a Century of Dentistry.” *Science* 92(2386):247-52. doi:10.1126/science.92.2386.247.
- . 1942. “The Fuller Utilization of Scientific Resources for Total War.” *Science* 96(2504):571-5. doi:10.1126/science.96.2504.571.
- . 1947. *Experimental Air-Borne Infection*. Baltimore, MD: Williams & Wilkins Co.
- . 1949. *Peace or Pestilence: Biological Warfare and How to Avoid It*. New York, NY: Whittlesey House.
- . 1956. “Review of ‘Airborne Contagion and Air Hygiene: An Ecological Study of Droplet Infections.’ By William Firth Wells.” *Q Rev Biol* 31(2):161-2.

- . 1960. "Some Historical Considerations." *Bull At Sci* 16(6):227-36. doi:10.1080/00963402.1960.11454103.
- . 1962. *Microorganisms Indigenous to Man*. New York, NY: McGraw-Hill.
- . 1963. "Medical Ethics and Biological Warfare." *Perspect Biol Med* 6:512-23. doi:10.1353/pbm.1963.0021.
- . 1967. "U.S. May Use Stronger Chemical-Biological Weapons in Vietnam." *Gazette and Daily*, July 13, 1967.
- and Elvin A. Kabat. 1947. "Bacterial Warfare, a Critical Analysis of the Available Agents, Their Possible Military Applications, and the Means for Protection Against Them." *J Immunol* 56(1):7-96.
- and Leuman M. Waugh. 1939. "Dental Caries Among Eskimos of the Kuskokwim Area of Alaska: I. Clinical and Bacteriologic Findings." *Am J Dis Child* 57(4):871-93. doi:10.1001/archpedi.1939.01990040135010.
- and Maxwell Karshan. 1931. "Studies, in the Rat, of Susceptibility to Dental Caries: I. Bacteriological and Nutritional Factors." *J Dent Res* 11(1):121-35. doi:10.1177/00220345310110010201.
- and Melba Phillips. 1949. "Two Aspects of the Loyalty Problem." *Science* 110(2848):123-4. doi:10.1126/science.110.2848.123.
- , Harold V. Ellingson, and Gordon Meiklejohn. 1947. "A Laboratory Infection with Psittacosis Virus Treated with Penicillin and Sulfadiazine, and Experimental Data Bearing on the Mode of Infection." *J Infect Dis* 80(1):64-77. doi:10.1093/infdis/80.1.64.
- Rosen, George. 1963. "Charles V. Chapin and the Public Health Movement." *Am J Public Health Nations Health* 53(5):844-5. doi:10.2105/AJPH.53.5.844.
- Rosenau, Milton J. 1935. *Preventive Medicine and Hygiene*. New York, NY: D. Appleton & Co.
- Rosenthal, Elisabeth. 2003. "Confusion in China Over Mystery Illness." *New York Times*, March 28, 2003.
- . 2021. "Analysis: How the US Invested in the War on Terrorism at the Cost of Public Health." *KFF Health News*, March 29, 2021. <https://khn.org/news/article/analysis-public-health-pandemic-war-on-terrorism>.
- Rosenthal, Jim. 2021. "IAQ Research-Practice in Action: The Corsi/Rosenthal Box Air Cleaner." *Tex-Air Filters*, July 24, 2021. <https://www.texairfilters.com/iaq-research-practice-in-action-the-corsi-rosenthal-box-air-cleaner>.
- Rossi, Florent, Raphaëlle Péguilhan, Nathalie Turgeon, et al. 2023. "Quantification of Antibiotic Resistance Genes (ARGs) in Clouds at a Mountain Site (Puy de Dôme, Central France)." *Sci Total Environ* 865:161264. doi:10.1016/j.scitotenv.2022.161264.
- Rothe, Camilla, Mirjam Schunk, Peter Sothmann, et al. 2020. "Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany." *N Engl J Med* 382(10):970-1. doi:10.1056/NEJMc2001468.

- Roy, Chad J., and Donald K. Milton. 2004. "Airborne Transmission of Communicable Infection—The Elusive Pathway." *N Engl J Med* 350(17):1710-2. doi:10.1056/NEJMp048051.
- Ruisinger, Marion M. 2020. "Die Pestarztmaske im Deutschen Medizinhistorischen Museum Ingolstadt." *NTM* 28(2):235-52. doi:10.1007/s00048-020-00255-7.
- Rush, Benjamin. 1789. *Medical Inquiries and Observations*. Philadelphia, PA: Prichard & Hall.
- . 1794. *An Account of the Bilious Remitting Yellow Fever*. Philadelphia, PA: Thomas Dobson.
- Rusk, Howard A. 1957. "Asian Flu Epidemic." *New York Times*, June 23, 1957.
- Rydell, Robert W. 1985. "The Fan Dance of Science: American World's Fairs in the Great Depression." *Isis* 76(4):525-42. <https://www.jstor.org/stable/233025>.
- Sabin, Susanna, Alexander Herbig, Åshild J. Vågane, et al. 2020. "A Seventeenth-Century *Mycobacterium tuberculosis* Genome Supports a Neolithic Emergence of the Mycobacterium tuberculosis Complex." *Genome Biol* 21(1):201. doi:10.1186/s13059-020-02112-1.
- Sadler, Simon. 2016. "The Bateson Building, Sacramento, California, 1977-81, and the Design of a New Age State." *J Soc Archit Hist* 75(4):469-89. <https://www.jstor.org/stable/26418941>.
- Saelens, Joseph W., Mollie I. Sweeney, Gopinath Viswanathan, et al. 2022. "An Ancestral Mycobacterial Effector Promotes Dissemination of Infection." *Cell* 185(24):4507-25.e18. doi:10.1016/j.cell.2022.10.019.
- Saenz, Arlette. 2018. "Joe Biden Believes He Is the 'Most Qualified Person in the Country to Be President'." *CNN*, December 4, 2018. <https://edition.cnn.com/2018/12/04/politics/joe-biden-most-qualified-person-president-2020/index.html>.
- Salazar-Hamm, Paris S., Kyana N. Montoya, Liliam Montoya, et al. 2022. "Breathing Can Be Dangerous: Opportunistic Fungal Pathogens and the Diverse Community of the Small Mammal Lung Mycobiome." *Front Fungal Biol* 3:996574. doi:10.3389/ffunb.2022.996574.
- Sang-Hun, Choe. 2015. "Fears of MERS Virus Prompt Broadening of Cautions in South Korea." *New York Times*, June 3, 2015.
- Santarpia, Joshua L., Danielle N. Rivera, Vicki Herrera, et al. 2020a. "Aerosol and Surface Contamination of SARS-CoV-2 Observed in Quarantine and Isolation Care." *Sci Rep* 10(1):12732. doi:10.1038/s41598-020-69286-3.
- , Danielle N. Rivera, Vicki Herrera, et al. 2020b. "Transmission Potential of SARS-CoV-2 in Viral Shedding Observed at the University of Nebraska Medical Center." *medRxiv*. doi:10.1101/2020.03.23.20039446.
- Šantl-Temkiv, Tina, Pierre Amato, Emilio O. Casamayor, et al. 2022. "Microbial Ecology of the Atmosphere." *FEMS Microbiol Rev* 46(4):1-18. doi:10.1093/femsre/fuac009.
- Sapp, Jan. 2021. *Genes, Germs and Medicine: The Life of Joshua Lederberg*. Hackensack, NJ: World Scientific.
- Sarjeant, William A. S. 1978. "Hundredth Year Memoriam: Christian Gottfried Ehrenberg 1795-1876." *Palynology* 2(1):209-11. doi:10.1080/01916122.1978.9989177.

- SARS Expert Committee. 2003. "SARS in Hong Kong: From Experience to Action." October 2, 2003. <https://www.sars-expertcom.gov.hk/english/reports/reports.html>
- Saunders, Diane G. O., Zacharias A. Pretorius, and Mogens S. Hovmøller. 2019. "Tackling the Re-Emergence of Wheat Stem Rust in Western Europe." *Commun Biol* 2(1):51. doi:10.1038/s42003-019-0294-9.
- Scales, Damon C., Karen Green, Adrienne K. Chan, et al. 2003. "Illness in Intensive Care Staff After Brief Exposure to Severe Acute Respiratory Syndrome." *Emerg Infect Dis* 9(10):1205-10. doi:10.3201/eid0910.030525.
- Schlich, Thomas, and Bruno J. Strasser. 2022. "Making the Medical Mask: Surgery, Bacteriology, and the Control of Infection (1870s-1920s)." *Med Hist* 66(2):116-34. doi:10.1017/mdh.2022.5.
- Schmale, David G., and Shane D. Ross. 2015. "Highways in the Sky: Scales of Atmospheric Transport of Plant Pathogens." *Annu Rev Phytopathol* 53(1):591-611. doi:10.1146/annurev-phyto-080614-115942.
- and Shane D. Ross. 2017. "High-Flying Microbes." *Sci Am* 316(2):40-5. doi:10.1038/scientificamerican0217-40.
- Schorr, Bill. 2003. "Bill Schorr Cartoon for 04/24/2003." *Cagle Cartoons*, April 24, 2003. <https://www.cagle.com/bill-schorr/2003/04/bill-schorr-cartoon-for-04242003>.
- Schultz, Charles. 1967. *Peanuts*, January 1, 1967. https://peanuts.fandom.com/wiki/January_1967_comic_strips.
- Schultz, Myron G., and William Schaffner. 2015. "Alexander Duncan Langmuir." *Emerg Infect Dis* 21(9):1635-7. doi:10.3201/eid2109.141445.
- Schütz, Mathias. 2020. "After Pettenkofer. Munich's Institute of Hygiene and the Long Shadow of National Socialism, 1894-1974." *Int J Med Microbiol* 310(5):151434. doi:10.1016/j.ijmm.2020.151434.
- Schwartz, Michael. 2020. "Nurses Die, Doctors Fall Sick and Panic Rises on Virus Front Lines." *New York Times*, March 30, 2020.
- Science Friday. 2014. "Nothing to Sneeze At." *YouTube*, May 1, 2014. <https://www.youtube.com/watch?v=wnafrAtfMzE>
- Science Service. 1933. "Stratosphere Trip Planned for Fair." *Buffalo Evening News*, May 26, 1933, p. 29.
- . 1940. "Germ Killing Rays Urged for Barracks Rooms." *Cincinnati Post*, November 2, 1940.
- . 1944. "Ultraviolet Irradiation of Barracks Lessens Sickness." *Gazette and Daily*, October 11, 1944.
- Seager, Sara, Janusz J. Petkowski, Peter Gao, et al. 2021. "The Venusian Lower Atmosphere Haze as a Depot for Desiccated Microbial Life: A Proposed Life Cycle for Persistence of the Venusian Aerial Biosphere." *Astrobiology* 21(10):1206-23. doi:10.1089/ast.2020.2244.

Sedgwick, William T. 1891. “An Epidemic of Typhoid Fever in Lowell, Mass—Abstract of a Report Upon the Sanitary Condition of the Water-Supply Made to the Lowell Water Board, April 10, 1891.” *Boston Med Surg J* 124:426-30. doi:10.1056/NEJM189104301241802.

— 1902. *Principles of Sanitary Science and the Public Health*. New York, NY: Macmillan.

Sehdev, Paul S. 2002. “The Origin of Quarantine.” *Clin Infect Dis* 35(9):1071-2. doi:10.1086/344062.

Seifman, David. 2009. “Man Up, Biden!” *New York Post*, May 1, 2009. <https://nypost.com/2009/05/01/man-up-biden>.

Selden, Paul. 2021. “Terrestrialisation (Precambrian–Devonian).” *eLS* 2(4):1-6. doi:10.1002/9780470015902.a0029314.

Select Subcommittee on the Coronavirus Crisis. 2022a. “The Atlas Dogma: The Trump Administration’s Embrace of a Dangerous and Discredited Herd Immunity Via Mass Infection Strategy.” June 21, 2022. <https://coronavirus-democrats-oversight.house.gov/news/reports/new-select-subcommittee-report-reveals-full-scope-trump-administration-s-embrace>.

—. 2022b. “‘Now to Get Rid of Those Pesky Health Departments!’ How the Trump Administration Helped the Meatpacking Industry Block Pandemic Worker Protections.” May 12, 2022. <https://coronavirus-democrats-oversight.house.gov/news/reports/new-select-subcommittee-report-reveals-extensive-coordination-between-trump>.

—. 2022c. “‘It Was Compromised’: The Trump Administration’s Unprecedented Campaign to Control CDC and Politicize Public Health During the Coronavirus Crisis.” October 17, 2022. <https://coronavirus-democrats-oversight.house.gov/news/press-releases/clyburn-trump-cdc-redfield-caputo-report>.

Sencer, David J., H. B. Dull, and Alexander D. Langmuir. 1967. “Epidemiologic Basis for Eradication of Measles in 1967.” *Public Health Rep* 82(3):253-6.

Seto, Wing H., John M. Conly, Carmen L. Pessoa-Silva, et al. 2013. “Infection Prevention and Control Measures for Acute Respiratory Infections in Healthcare Settings: An Update.” *East Mediterr Health J* 19 Suppl 1:S39-47.

Setzekorn, Eric. 2022. “Disease and Dissent: Progressives, Congress, and the WWI Army Training Camp Crisis.” *J Gilded Age Progress Era* 21(2):93-110. doi:10.1017/S1537781421000669.

Shadbolt, Peter. 2013. “SARS 10 Years on: How Dogged Detective Work Defeated an Epidemic.” *CNN*, February 21, 2013. <https://www.cnn.com/2013/02/21/world/asia/sars-amoy-gardens/index.html>.

Shah, Sonia. 2016. *Pandemic: Tracking Contagions, From Cholera to Ebola and Beyond*. New York, NY: Macmillan.

Shalett, Sidney. 1946a. “U.S. Was Prepared to Combat Axis in Poison-Germ Warfare.” *New York Times*, January 4, 1946.

—. 1946b. “The Deadliest War—Germ Warfare.” *Collier’s Magazine*, June 15, 1946.

- Shaltz, Joseph. 1941. "'Sneezer' Unmasks Disease." *Philadelphia Record*.
- Shane, Scott. 2004. "Buried Secrets of Biowarfare." *Baltimore Sun*, August 1, 2004.
- Sharman, Jon. 2017. "Donald Trump Admits 'I Have Germ Phobia' in Howard Stern Interview." *Independent*, September 26, 2017.
- Shaw, Karen. 2006. "The 2003 SARS Outbreak and Its Impact on Infection Control Practices." *Public Health* 120(1):8-14. doi:10.1016/j.puhe.2005.10.002.
- Shear, Michael, Abby Goodnough, Sheila Kaplan, et al. 2020. "The Lost Month: How a Failure to Test Blinded the U.S. to Covid-19." *New York Times*, March 29, 2020.
- Sheikh, Knvul, Derek Watkins, Jin Wu, et al. 2020. "How Bad Will the Coronavirus Outbreak Get? Here Are 6 Key Factors." *New York Times*, February 28, 2020.
- Shelley, Mary Wollstonecraft. 1823. *Frankenstein, or the Modern Prometheus*. London: G. and W.G. Whittaker.
- and Percy Bysshe Shelley. 1817. *History of a Six Weeks' Tour Through a Part of France, Switzerland, Germany and Holland*. London: T. Hookham.
- Shepherd, Marguerite. 1959. "Germ Warfare Has Terrible Potential." *St. Louis Globe-Democrat*, December 13, 1959, p. 55.
- Sherman, Irwin W. 2020. *The Power of Plagues*. Washington, DC: ASM Press.
- Shuren, Jeffrey, and Timothy Stenzel. 2021. "South Korea's Implementation of a COVID-19 National Testing Strategy." *Health Affairs*, May 25, 2021.
<https://www.healthaffairs.org/content/forefront/south-korea-s-implementation-covid-19-national-testing-strategy>
- Sidell, Frederick R., Ernest T. Takafuji, and David R. Franz. 1997. *Medical Aspects of Chemical and Biological Warfare*. Washington, DC: Office of the Surgeon General, U.S. Army.
- Simonsen, Lone, Peter Spreeuwenberg, Roger Lustig, et al. 2013. "Global Mortality Estimates for the 2009 Influenza Pandemic from the GLAMOR Project: A Modeling Study." *PLoS Med* 10(11):e1001558. doi:10.1371/journal.pmed.1001558.
- Sims-Dawson, Charles H. 1915. "How Deadly New Bacilli May Be Bred to Take the Place of Bullets." *San Francisco Examiner*, September 5, 1915, p. 27.
- Skagit County. 2020a. "Declaration of Emergency and Health Officer Recommendations." March 10, 2020. <https://www.skagitcounty.net/Departments/Home/press/031020.htm>
- . 2020b. "Letter to Skagit Valley Chorale." April 21, 2020.
- Skotnicki, M. L., P. M. Selkirk, Paul Broady, et al. 2001. "Dispersal of the Moss *Campylopus pyriformis* on Geothermal Ground Near the Summits of Mount Erebus and Mount Melbourne, Victoria Land, Antarctica." *Antarctic Sci* 13(3):280-5. doi:10.1017/s0954102001000396.
- Smith, David J., and Samantha M. Waters. 2019. "Stratosphere Biology." In *Encyclopedia of Astrobiology*, 1-3. Berlin: Springer.

- Smith, Maddie. 2022. "Skagit Valley Chorale Preps for First Performances with Live Audiences in More Than Two Years." *Skagit Valley Herald*, April 27, 2022.
- Smith, Nathan R. 1938. "Fred Campbell Meier." *Science* 88(2280):233. doi:10.1126/science.88.2280.233.a.
- Smith, R. J. 1984. "New Army Biowarfare Lab Raises Concerns." *Science* 226(4679):1176-8. doi:10.1126/science.6505684.
- Smith, Tara. 2014a. "Everything You Know About Ebola Is Wrong." *Mic*, August 6, 2014. <https://www.mic.com/articles/95640/everything-you-know-about-ebola-is-wrong>.
- . 2014b. "'The Hot Zone' and the Mythos of Ebola." *ScienceBlogs*, October 20, 2014. <https://scienceblogs.com/aetiology/2014/10/21/the-hot-zone-and-the-mythos-of-ebola>.
- Snider, Dixie E., Carolyn B. Bridges, and David N. Weissman. 2010. "Meeting Summary of the Workshop 'Approaches to Better Understand Human Influenza Transmission'."
- Snow, John. 1849. *On the Mode of Communication of Cholera*. London: J. Churchill.
- Snowden, Frank M. 2020. *Epidemics and Society: From the Black Death to the Present*. New Haven, CT: Yale University Press.
- Soret, Charles. 1896. *Catalogue des Ouvrages, Articles et Mémoires*. Geneva: Imprimerie Rey & Malavallon.
- Spencer, Steven M. 1938. "Black Light Kills 'Flying' Germs." *Philadelphia Bulletin*.
- . 1946. "War on the Flying Microbes." *Saturday Evening Post*, February 16, 1946.
- Stafford, Jane. 1941. "Urges Light Rays in Army Camps." *Cincinnati Post*, April 25, 1941.
- Stahl, Leslie. 2020. "Raw Sewage Flowing into the Tijuana River Brings Toxic Sludge to California." *CBS News*, September 13, 2020. <https://www.cbsnews.com/news/raw-sewage-southern-california-coast-tijuana-mexico-60-minutes-2020-09-13>.
- Stakman, Elvin. 1937. "The Promise of Modern Botany for Man's Welfare Through Plant Protection." *Sci Monthly* 44(2):117-30. <https://www.jstor.org/stable/16233>.
- . 1942. "The Field of Extramural Aerobiology." In *Aerobiology*. Washington, DC: American Association for the Advancement of Science.
- and Clyde M. Christensen. 1946. "Aerobiology in Relation to Plant Disease." *Bot Rev* 12(4):205-53. doi:10.1007/BF02861523.
- , Arthur W. Henry, Gordon C. Curran, et al. 1923. "Spores in the Upper Air." *J Agric Res* 24(7):599-606.
- Staughton, William. 1813. *An Eulogium in Memory of the Late Dr. Benjamin Rush*. Philadelphia, PA: Published by request of the graduates.
- Stearns, Justin K. 2011. *Infectious Ideas: Contagion in Premodern Islamic and Christian Thought in the Western Mediterranean*. Baltimore, MD: Johns Hopkins University Press.

- Stefansson, Halldor. 2003. "Infectious Diseases and Bioweapons: Science and Political Economics of Affliction." *EMBO Rep* 4 Spec No(Suppl 1):S1-3. doi:10.1038/sj.embor.embor843.
- Steinbacher, Sybille. 2010. "The Concentration and Extermination Camps of the Nazi Regime." In *The Routledge History of the Holocaust*. London: Routledge.
- Stern, Jacob. 2023. "What the Pandemic Simulations Missed." *Atlantic*, May 30, 2023. <https://www.theatlantic.com/health/archive/2023/05/pandemic-war-games-predictions-covid-lessons/674213>.
- Stern, Ken. 2020. "Taking Flattening the Curve Seriously." *La Conner Weekly News*, March 25, 2020.
- Stevens, Albert W. 1934. "Exploring the Stratosphere." *National Geographic* 66(4):397-434.
- . 1936. "The Scientific Results of the World-Record Stratosphere Flight." *National Geographic* 69(5):693-714.
- Stevenson, John A. 1954. "Plants, Problems, and Personalities: The Genesis of the Bureau of Plant Industry." *Agric Hist* 28(4):155-62. <https://www.jstor.org/stable/3740510>.
- Stewart, Justin D., and Peleg Kremer. 2021. "Urban Atmospheric Microbiome." In *The Palgrave Encyclopedia of Urban and Regional Futures*, 1-7. Cham: Springer.
- Stokholm, Iben, Wendy Puryear, Kaitlin Sawatzki, et al. 2021. "Emergence and Radiation of Distemper Viruses in Terrestrial and Marine Mammals." *Proc Biol Sci* 288(1961):20211969. doi:10.1098/rspb.2021.1969.
- Stolberg, Sheryl G. 2002. "Buckets for Bioterrorism, But Less for Catalog of Ills." *New York Times*, February 5, 2002.
- Stone, Brandon. 2020. "Skagit County's First Case of COVID-19 Confirmed." *Skagit Valley Herald*, March 10, 2020.
- . 2021. "Singing Again: Skagit Valley Chorale Resumes In-Person Practices." *Skagit Valley Herald*, October 17, 2021.
- Strasser, Bruno J., and Thomas Schlich. 2020. "A History of the Medical Mask and the Rise of Throwaway Culture." *Lancet* 396(10243):19-20. doi:10.1016/S0140-6736(20)31207-1.
- Strohlic, Nina. 2020. "This Overlooked Aviator Fought to Create Her Own Record-Breaking Legacy." *National Geographic*, March 30, 2020. <https://www.nationalgeographic.com/history/article/she-was-a-record-breaking-aviator-but-her-husband-overshadowed-her-feats>.
- Strong, Richard P., George F. Petrie, and Arthur Stanley. 1912. *Report of the International Plague Conference Held at Mukden, April 1911*. Manila: Bureau of Printing.
- Strullu-Derrien, Christine, Marc-André Selosse, Paul Kenrick, et al. 2018. "The Origin and Evolution of Mycorrhizal Symbioses: From Palaeomycology to Phylogenomics." *New Phytol* 220(4):1012-30. doi:10.1111/nph.15076.

—, Tomasz Goral, Alan R. T. Spencer, et al. 2023. “A Fungal Plant Pathogen Discovered in the Devonian Rhynie Chert.” *Nat Commun* 14(1):7932. doi:10.1038/s41467-023-43276-1.

Sugden, Joanna, and Stephen Fidler. 2020. “How British Scientists Tracked Down the New Covid-19 Variant.” *Wall Street Journal*, December 23, 2020.

Sullivan, Kate. 2020. “Biden Receives First Dose of Covid-19 Vaccine on Live Television.” *CNN*, December 21, 2020. <https://www.cnn.com/2020/12/21/politics/bidens-coronavirus-vaccination/index.html>.

Sullivan, Walter. 1970. “Air Current Suspected as Smallpox Carrier.” *New York Times*, November 3, 1970.

Sun, Lena H. 2018. “Top White House Official in Charge of Pandemic Response Exits Abruptly.” *Washington Post*, May 10, 2018.

— and Laurie McGinley. 2020. “Memos from CDC to White House Lay Out Rationale for Possible Widespread Use of Face Coverings.” *Washington Post*, March 31, 2020.

Sun, Xin, Craig Liddicoat, Alexei Tiunov, et al. 2023. “Harnessing Soil Biodiversity to Promote Human Health in Cities.” *NPJ Urban Sustain* 3(1):5. doi:10.1038/s42949-023-00086-0.

Sundberg, Sebastian. 2010. “Size Matters For Violent Discharge Height and Settling Speed of Sphagnum Spores: Important Attributes for Dispersal Potential.” *Ann Bot* 105:291-300.

SVC Vocal Course. 2020. “Skagit Valley Chorale ‘Heralding Christmas’ 2020 Online Concert.” *YouTube*, December 13, 2020. <https://www.youtube.com/watch?v=bqYdNIk5fug>.

Swanson, Mark N. 2010. “Qustā Ibn Lūqā.” In *Christian-Muslim Relations 600-1500*. Edited by David Thomas and Alexander Mallett. Leiden: Brill.

Szyborska, Wislawa. 2002. “Sky.” In *Miracle Fair: Selected Poems of Wislawa Szymborska*. New York, NY: W. W. Norton & Co.

Tai, Don B. G., Aditya Shah, Chyke A. Doubeni, et al. 2021. “The Disproportionate Impact of COVID-19 on Racial and Ethnic Minorities in the United States.” *Clin Infect Dis* 72(4):703-6. doi:10.1093/cid/ciaa815.

Tang, Julian W., and Yuguo Li. 2007. “Transmission of Influenza A in Human Beings.” *Lancet Infect Dis* 7(12):758. doi:10.1016/S1473-3099(07)70268-2.

Tang, Julian W., Raymond Tellier, and Yuguo Li. 2022. “Hypothesis: All Respiratory Viruses (Including SARS-CoV-2) Are Aerosol-Transmitted.” *Indoor Air* 32(1):e12937. doi:10.1111/ina.12937.

Tang, Julian W., William P. Bahnfleth, Philomena M. Bluyssen, et al. 2021. “Dismantling Myths on the Airborne Transmission of Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2).” *J Hosp Infect* 110:89-96. doi:10.1016/j.jhin.2020.12.022.

Tankersley, Jim, Noah Weiland, Emily Cochrane, et al. 2020. “A Top White House Coronavirus Adviser Has Resisted Widespread Testing, Pushing for a Form of Herd Immunity Instead.” *New York Times*, October 16, 2020.

Tansey, Bernadette. 2004. "Serratia Has Dark History in Region." *San Francisco Chronicle*, October 31, 2004.

Taylor, Charles A., Christopher Boulos, and Douglas Almond. 2020. "Livestock Plants and COVID-19 Transmission." *Proc Natl Acad Sci U S A* 117(50):31706-15. doi:10.1073/pnas.2010115117.

Taylor, Geoffrey, and Jane Walker. 1973. "Charles Harrison Blackley, 1820-1900." *Clin Allergy* 3(2):103-8. doi:10.1111/j.1365-2222.1973.tb01314.x.

Tellier, Raymond. 2006. "Review of Aerosol Transmission of Influenza A Virus." *Emerg Infect Dis* 12(11):1657-62. doi:10.3201/eid1211.060426.

Temkin, Owsei. 1977. *The Double Face of Janus and Other Essays in the History of Medicine*. Baltimore, MD: Johns Hopkins University Press.

Terris, Milton. 1999. "Charles V. Chapin (1856-1941), 'Dean of City Health Officers'." *J Public Health Policy* 20(2):214-20. doi:10.2307/3343212.

Tesson, Sylvie V. M., Carsten A. Skjøth, Tina Šantl-Temkiv, et al. 2016. "Airborne Microalgae: Insights, Opportunities, and Challenges." *Appl Environ Microbiol* 82(7):1978-91. doi:10.1128/AEM.03333-15.

Thomas, Evan. 1985. "The New Untouchables." *Time*, September 23, 1985.

Thomazo, Christophe, Estelle Couradeau, Anna Giraldo-Silva, et al. 2020. "Biological Soil Crusts as Modern Analogs for the Archean Continental Biosphere: Insights from Carbon and Nitrogen Isotopes." *Astrobiology* 20(7):815-9. doi:10.1089/ast.2019.2144.

Thompson, Albert W. 1924. *Air Conditioning in Textile Mills*. Fitchburg, MA: Parks-Cramer Co.

Thorne, Van B. 1923. "Mysterious Ills That Still Baffle Science." *New York Times*, November 18, 1923.

Thrasher, Steven W. 2022. "The Biden Administration Has Failed Its Covid Test." *Guardian*, January 15, 2022. <https://www.theguardian.com/us-news/2022/jan/15/omicron-covid-joe-biden-administration>

Timerman, David, and Spencer C. H. Barrett. 2021. "The Biomechanics of Pollen Release: New Perspectives on the Evolution of Wind Pollination in Angiosperms." *Biol Rev Camb Philos Soc* 96(5):2146-63. doi:10.1111/brv.12745.

Timmons, Michael B., Gregg Rivara, Dale Baker, et al. 2004. *New York Aquaculture Industry: Status, Constraints and Opportunities*. Ithaca, NY: Cornell University Press.

Tingley, Kim. 2021. "How the Skagit Valley Chorale Learned to Sing Again Amid Covid." *New York Times*, April 8, 2021.

Tizard, Ian R. 2020. "Vaccination Against Coronaviruses in Domestic Animals." *Vaccine* 38(33):5123-30. doi:10.1016/j.vaccine.2020.06.026

Tomes, Nancy. 1999. *The Gospel of Germs: Men, Women, and the Microbe in American Life*. Cambridge, MA: Harvard University Press.

—. 2010. “‘Destroyer and Teacher’: Managing the Masses During the 1918-1919 Influenza Pandemic.” *Public Health Rep* 125 Suppl 3(Suppl 3):48-62. doi:10.1177/00333549101250S308.

Toosi, Nahal, Daniel Lippman, and Dan Diamond. 2020. “Before Trump’s Inauguration, a Warning: ‘The Worst Influenza Pandemic Since 1918’.” *Politico*, March 16, 2020.

<https://www.politico.com/news/2020/03/16/trump-inauguration-warning-scenario-pandemic-132797>.

Torbati, Yeganeh, and Isaac Arnsdorf. 2020. “How Tea Party Budget Battles Left the National Emergency Medical Stockpile Unprepared for Coronavirus.” *ProPublica*, April 3, 2020.

<https://www.propublica.org/article/us-emergency-medical-stockpile-funding-unprepared-coronavirus>.

Trenholm, Sandra. 2012. “Food Conservation During WWI: ‘Food Will Win the War’.” *Gilder Lehrman Institute of American History*, October 16, 2012.

<https://www.gilderlehrman.org/news/food-conservation-during-wwi-food-will-win-war>.

Trump, Donald. 2016. “Transcript: Donald Trump at the G.O.P. Convention.” *New York Times*, July 22, 2016.

Tsai, Kathy, and Connie Tsai. 2020. “Our Dad Invented the N95 Mask: Our Taiwanese American Story.” *Taiwanese American*, September 14, 2020.

<https://www.taiwaneseamerican.org/2020/09/peter-tsai-n95-inventor/>.

Tsai, Peter. 2020. “Where I Work.” *Nature* 585:316. doi:10.1038/d41586-020-02550-8.

Tucker, Greenleaf R. 1890. “The Number and Distribution of Micro-Organisms in the Air of the Boston City Hospital.” *Public Health* 3:78-85. doi:10.1016/S0033-3506(05)80727-9.

Tucker, Jonathan B. 2002. “A Farewell to Germs: The U.S. Renunciation of Biological and Toxin Warfare, 1969-70.” *Int Secur* 27(1):107-48. <https://www.jstor.org/stable/3092154>.

Turkel, Studs, and Theodor Rosebury. 1969. “Dr. Theodor Rosebury Discusses His Book ‘Life on Man’.” *Studs Turkel Radio Archive*. <https://studsterkel.wfmt.com/programs/dr-theodor-rosebury-discusses-his-book-life-man>.

Turner, Clair E., Marshall W. Jennison, and Harold E. Edgerton. 1941. “Public Health Applications of High-Speed Photography.” *Am J Public Health Nations Health* 31(4):319-24. doi:10.2105/ajph.31.4.319.

Turner, R. S. 2005. “After the Famine: Plant Pathology, *Phytophthora infestans*, and the Late Blight of Potatoes, 1845-1960.” *Hist Stud Phys Biol Sci* 35(2):341-70. doi:10.1525/hsps.2005.35.2.341.

Ueckermann, Veronica, et al. 2023. “Remote Aerosol SARS-CoV-2 Transmission from Clinical COVID Patients to Rodent Sentinels.” *Int J Tuberc Lung Dis* 27(11 Suppl 1):S634.

U.K. Government. 2002. *Iraq’s Weapons of Mass Destruction: The Assessment of the British Government*. London: Diane Publishing.

United Nations. 2020. “Coronavirus Outbreak: WHO Update (11 February 2020).” *YouTube*, February 11, 2020. <https://www.youtube.com/watch?v=hd2QoYt5Ffw>.

United Nations Environment Programme. 2016. *Global Assessment of Sand and Dust Storms*. Nairobi: United Nations Environment Programme.

<https://repositorio.aemet.es/handle/20.500.11765/4495>.

United Nations Office for Disarmament Affairs. 1975. "History of the Biological Weapons Convention." January 22, 1975. <https://disarmament.unoda.org/biological-weapons/about/history>.

U.S. Army American Expeditionary Forces. 1919. *Historical Report of the Chief Engineer: Including All Operations of the Engineer Department*. USGPO.

U.S. Army Center of Military History. 2017. "Camp Meade and the Influenza Epidemic of 1918."

https://history.army.mil/curriculum/wwi/docs/AdditionalResources/presentations/Camp_Meade_Flu.pdf.

U.S. Army Corps of Engineers. 1920. *History of the Twenty-Sixth Engineers (Water Supply Regiment) in the World War, September, 1917-March, 1919*. New York, NY: New England Water Works Association.

U.S. Army Medical Department. 1955. *Preventive Medicine in World War II. Vol 2: Environmental Hygiene*. Washington, DC: Office of the Surgeon General.

<http://resource.nlm.nih.gov/1278003RX1>.

U.S. Army Medical Research Institute of Infectious Diseases. 1979. *Annual Progress Report*.

U.S. Congress Office of Technology Assessment. 1993. "Proliferation of Weapons of Mass Destruction: Assessing the Risks Ota-Is-559." <https://apps.dtic.mil/sti/pdfs/ADA338803.pdf>.

U.S. Department of Defense. 1950. "Report of the Secretary of Defense's Ad Hoc Committee on Chemical, Biological and Radiological Warfare."

<https://www.osti.gov/opennet/servlets/purl/16008529.pdf>.

U.S. Department of Health and Human Services. 2005. *Pandemic Influenza Plan*.

<https://www.cdc.gov/flu/pdf/professionals/hhspandemicinfluenzaplan.pdf>.

—. 2017. *Pandemic Influenza Plan 2017 Update*. <https://www.cdc.gov/flu/pandemic-resources/pdf/pan-flu-report-2017v2.pdf>.

U.S. Department of State. 2005. "Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments." <https://2009-2017.state.gov/t/avc/rls/rpt/51977.htm>.

—. 2020. "Members of the Coronavirus Task Force Hold a Press Briefing." *YouTube*, March 31, 2020. <https://www.youtube.com/watch?v=e9v8ZZd1P0M>.

U.S. Department of War. 1919. *Report of the Surgeon General, U.S. Army, to the Secretary of War*. USGPO.

U.S. Federal Civil Defense Administration. 1951. *What You Should Know About Biological Warfare: The Official U. S. Government Booklet*. USGPO.

<https://hdl.handle.net/2027/uc1.a0010990059>.

U.S. Government Accountability Office. 2021. “DHS Exploring New Methods to Replace BioWatch and Could Benefit from Additional Guidance.” GAO-21-292.

U.S. Senate Committee on Armed Services. 2002. *The Dark Winter Scenario and Bioterrorism*. USGPO.

U.S. Senate Committee on Homeland Security & Governmental Affairs. 2022. “Historically Unprepared: Examination of the Federal Government’s Pandemic Preparedness and Initial Covid-19 Response.” December 2022. <https://www.hsgac.senate.gov/media/majority-media/peters-investigation-finds-significant-failures-in-federal-governments-pandemic-preparedness-and-initial-covid-19-response->.

U.S. Senate Subcommittee on Health and Scientific Research of the Committee on Human Resources. 1977. *Biological Testing Involving Human Subjects by the Department of Defense*. USGPO.

U.S. Senate Subcommittee to Investigate the Administration of the Internal Security Act and Other Internal Security Laws. 1965. *The Anti-Vietnam Agitation and the Teach-in Movement: The Problem of Communist Infiltration and Exploitation*. USGPO.

Universal Studios. 1933. “Universal Newsreel About Thomas G. W. Settle’s Failed Balloon Launch Attempt.” https://en.wikipedia.org/wiki/File:1933-08-07_Stratosphere_Balloon_Falls.webm.

University of Pennsylvania. 1937. *Twenty-Seventh Report of the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis*.

—. 1939. *Twenty-Eighth Report of the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis*.

University of Texas. 1915. *Cactus Yearbook, 1915*. <http://hdl.handle.net/2152/24283>.

USA Today Editorial Board. 2020. “The COVID-19 Superspreader in the Rose Garden That Burst the White House Bubble. *USA Today*, October 6, 2020.

Vacher, Corinne, Arndt Hampe, Annabel J. Porté, et al. 2016. “The Phyllosphere: Microbial Jungle at the Plant-Climate Interface.” *Annu Rev Ecol Evol Syst* 47(1):1-24. doi:10.1146/annurev-ecolsys-121415-032238.

Valdes, Manuel. 2021. “Siblings Find Closure a Year After COVID-19 Thrashed Choir.” *Associated Press*, April 9, 2021. <https://apnews.com/article/coronavirus-pandemic-family-closure-1-year-after-ed0bc6db0fa5427c307f2bca2f562b82>.

Vallery-Radot, René. 1902. *The Life of Pasteur*. Translated by R. L. Devonshire. Westminster: Constable.

Van Bresse, Marie-Françoise, Pádraig J. Duignan, Ashley Banyard, et al. 2014. “Cetacean Morbillivirus: Current Knowledge and Future Directions.” *Viruses* 6(12):5145-81. doi:10.3390/v6125145.

Van Kerkhove, Maria D., Siddhivinayak Hirve, Artemis Koukounari, et al. 2013. “Estimating Age-Specific Cumulative Incidence for the 2009 Influenza Pandemic: A Meta-Analysis of

A(H1N1)pdm09 Serological Studies from 19 Countries.” *Influenza Other Respir Viruses* 7(5):872-86. doi:10.1111/irv.12074.

Van Vleck, Jenifer. 2013. *Empire of the Air: Aviation and the American Ascendancy*. Cambridge, MA: Harvard University Press.

Varia, Monali, Samantha Wilson, Shelly Sarwal, et al. 2003. “Investigation of a Nosocomial Outbreak of Severe Acute Respiratory Syndrome (SARS) in Toronto, Canada.” *CMAJ* 169(4):285-92. <https://www.cmaj.ca/content/169/4/285.short>.

Viboud, Cécile, Lone Simonsen, Rodrigo Fuentes, et al. 2016. “Global Mortality Impact of the 1957-1959 Influenza Pandemic.” *J Infect Dis* 213(5):738-45. doi:10.1093/infdis/jiv534.

Victor, Daniel, Lew Serviss, and Azi Paybarah. 2020. “In His Own Words, Trump on the Coronavirus and Masks.” *New York Times*, October 2, 2020.

Vogel, William F. 2021. “‘The Mighty Microbe Can Go to War’: Scientists, Secrecy, and American Biological Weapons Research, 1941-1969.” Dissertation, University of Minnesota.

Von Pettenkofer, Max. 1855. *Untersuchungen und Beobachtungen über die Verbreitungsart der Cholera*. Munich: J. G. Cotta.

—. 1873. *The Relations of the Air to the Clothes We Wear, the House We Live in, and the Soil We Dwell on*. London: N. Trübner & Co.

—. 1875. *Cholera: How to Prevent and Resist It*. London: Bailliere, Tindall & Cox.

—. 1884a. “Cholera.” *Lancet* 124(3197):769-71. doi:10.1016/S0140-6736(02)02521-7.

—. 1884b. “Cholera.” *Lancet* 124(3197):992-4. doi:10.1016/S0140-6736(02)28861-3.

—. 1887. “Von Pettenkofer’s Latest Views on Cholera.” *Lancet* 130(3337):339-40. doi:10.1016/S0140-6736(02)39149-9.

—. 1892. “On Cholera, with Reference to the Recent Epidemic at Hamburg.” *Lancet* 140(3612):1182-5. doi:10.1016/S0140-6736(01)92427-4.

Waite, K. J. 1995. “Blackley and the Development of Hay Fever as a Disease of Civilization in the Nineteenth Century.” *Med Hist* 39(2):186-96. doi:10.1017/s0025727300059834.

Waksman, Selman A. 1964. *The Conquest of Tuberculosis*. Berkeley, CA: University of California Press.

Wald, Matthew L. 1994. “Ultraviolet Faces Revival to Fight TB.” *New York Times*, January 4, 1994.

Waldstein, David. 2020. “Coronavirus Ravaged a Choir. But Isolation Helped Contain It.” *New York Times*, May 12, 2020.

Wang, Haidong, Katherine R. Paulson, Spencer A. Pease, et al. 2022. “Estimating Excess Mortality Due to the COVID-19 Pandemic: A Systematic Analysis of COVID-19-Related Mortality, 2020-21.” *Lancet* 399(10334):1513-36. doi:10.1016/S0140-6736(21)02796-3.

Warburton, C. W. 1938. “Fred C. Meier Lost on Hawaii Clipper.” *Ext Serv Rev* 9(10):157.

- Weaver, George H. 1918. "The Value of the Face Mask and Other Measures: In Prevention of Diphtheria, Meningitis, Pneumonia, Etc." *JAMA* 70(2):76-8. doi:10.1001/jama.1918.02600020010005.
- Weber, Lauren, Laura Unger, Michelle R. Smith, et al. 2020. "Hollowed-Out Public Health System Faces More Cuts Amid Virus." *KFF*, July 1, 2020. <https://kffhealthnews.org/news/us-public-health-system-underfunded-under-threat-faces-more-cuts-amid-covid-pandemic>
- Webster, Robert G. 2023. "Influenza: Searching for Pandemic Origins." *Ann Rev Virol* 10:1-23. doi:10.1146/annurev-virology-111821-125223.
- Weems, P. V. H. 1934. "The 1933 Lindbergh Flight." *Proceedings of the U.S. Naval Institute* 60(375):672. <https://www.usni.org/magazines/proceedings/1934/may/1933-lindbergh-flight>
- Wehrle, P. F., J. Posch, K. H. Richter, et al. 1970. "An Airborne Outbreak of Smallpox in a German Hospital and Its Significance with Respect to Other Recent Outbreaks in Europe." *Bull World Health Organ* 43(5):669-79.
- Wehrwein, Austin C. 1959. "Ultraviolet Irradiation of Air Is Said to Curb the Spread of Flu." *New York Times*, May 27, 1959.
- Wei, Huang. 2020. "A Brief History of Face Masks in China." *Sixth Tone*, February 12, 2020. <https://www.sixthtone.com/news/1005177>
- Weiland, Noah, Maggie Haberman, Mark Mazzetti, et al. 2020. "Trump Was Sicker Than Acknowledged with Covid-19." *New York Times*, February 11, 2021.
- Weindling, Paul. 2000. *Epidemics and Genocide in Eastern Europe, 1890-1945*. Oxford: Oxford University Press.
- . 2015. *Victims and Survivors of Nazi Human Experiments: Science and Suffering in the Holocaust*. London: Bloomsbury Academic.
- Weisberg, Richard E., and Bert Hansen. 2015. "Collaboration of Art and Science in Albert Edelfelt's Portrait of Louis Pasteur: The Making of an Enduring Medical Icon." *Bull Hist Med* 89(1):59-91. doi:10.1353/bhm.2015.0001.
- Weiss, Rick. 1989. "The Viral Advantage." *Science News*, September 23, 1989.
- Welch, David, Manuela Buonanno, Veljko Grilj, et al. 2018. "Far-UVC Light: A New Tool to Control the Spread of Airborne-Mediated Microbial Diseases." *Sci Rep* 8(1):2752. doi:10.1038/s41598-018-21058-w.
- Wells, Herbert G. 1895. *The Stolen Bacillus and Other Incidents*. London: Methuen.
- Wells, Mildred W. 1944. "The Seasonal Patterns of Measles and Chicken Pox." *Am J Epidemiol* 40(3):297-317. doi:10.1093/oxfordjournals.aje.a118995.
- . 1945. "Ventilation in the Spread of Chickenpox and Measles Within School Rooms." *JAMA* 129(3):197-200. doi:10.1001/jama.1945.02860370019006.
- . 1953. "969. Evaluation of Air Disinfection." *VI Congresso Internazionale di Microbiologia, Roma 6-12 Settembre 1953. Riassunti delle Comunicazioni* 3:265-6.

- and William A. Holla. 1950. “Ventilation in the Flow of Measles and Chickenpox Through a Community.” *JAMA* 142(17):1337-44. doi:10.1001/jama.1950.02910350007004.
- Wells, William F. 1913. “Use of Alum by Washington Water Works.” *Municipal J* 35(5):130-1.
- . 1916. “Artificial Purification of Oysters.” *Public Health Rep* 31(28):1848-52. doi:10.2307/4573851.
- . 1918. “An Improved Fermentation Tube Battery.” *Am J Public Health (N Y)* 8(12):904-5. doi:10.2105/ajph.8.12.904.
- . 1920. “The Purification of Oysters as a Conservation Measure.” *Am J Public Health (N Y)* 10(4):342-4. doi:10.2105/ajph.10.4.342.
- . 1922. *Studies in Oyster Culture*. New York, NY: J. B. Lyon Co.
- . 1933. “Apparatus for Study of the Bacterial Behavior of Air.” *Am J Public Health* 23:58-9.
- . 1934a. “On Air-Borne Infection: Study II. Droplets and Droplet Nuclei.” *Am J Epidemiol* 20(3):611-8. doi:10.1093/oxfordjournals.aje.a118097.
- . 1934b. “Viability of Bacteria in Air.” *J Wash Acad Sci* 24:276-7.
- . 1935. “Air-Borne Infection and Sanitary Air Control.” *J Ind Hyg Toxicol* 17:253-7.
- . 1940. “An Apparatus for the Study of Experimental Air-Borne Disease.” *Science* 91(2355):172-4. doi:10.1126/science.91.2355.172-a.
- . 1942. “Air-Borne Infection.” *Pennsylvania Gazette* 60(6).
- . 1943. “Air Disinfection in Day Schools.” *Am J Public Health Nations Health* 33(12):1436-43. doi:10.2105/ajph.33.12.1436.
- . 1948. “On the Mechanics of Droplet Nuclei Infection. I. Apparatus for the Quantitative Study of Droplet Nuclei Infection of Animals.” *Am J Hyg* 47(1):1-10. doi:10.1093/oxfordjournals.aje.a119176.
- . 1951. “Control of Respiratory Infection by Radiant Disinfection of Air.” *Proceedings of 3rd Annual Meeting, American Academy of Occupational Medicine*. 15-23.
- . 1953. “968. Airborne Contagium and Sanitary Ventilation.” *VI Congresso Internazionale di Microbiologia, Roma 6-12 Settembre 1953. Riassunti delle Comunicazioni* 3:263-4.
- . 1955. *Airborne Contagion and Air Hygiene: An Ecological Study of Droplet Infections*. Cambridge, MA: Harvard University Press.
- and Edward C. Riley. 1937. “An Investigation of the Bacterial Contamination of the Air of Textile Mills with Special Reference to the Influence of Artificial Humidification.” *J Ind Hyg Toxicol* 19:513-61.
- and Gordon M. Fair. 1935. “Viability of B. Coli Exposed to Ultra-Violet Radiation in Air.” *Science* 82(2125):280-1. doi:10.1126/science.82.2125.280-a.

- and H. W. Brown. 1936. “Recovery of Influenza Virus Suspended in Air and Its Destruction by Ultraviolet Radiation.” *Am J Epidemiol* 24(2):407-13. doi:10.1093/oxfordjournals.aje.a118273.
- and Max B. Lurie. 1941. “Experimental Air-Borne Disease: Quantitative Natural Respiratory Contagion of Tuberculosis.” *Am J Epidemiol* 34(1):21-40. doi:10.1093/oxfordjournals.aje.a118732.
- and Mildred W. Wells. 1936. “Air-Borne Infection.” *JAMA* 107(21):1698-703 & (22):1805-9.
- and Werner Henle. 1941. “Experimental Air-Borne Disease: Quantitative Inoculation by Inhalation of Influenza Virus.” *Proc Soc Exp Biol Med* 48(1):298-301. doi:10.3181/00379727-48-13301.
- and Wyman R. Stone. 1934. “On Air-Borne Infection: Study III. Viability of Droplet Nuclei Infection.” *Am J Epidemiol* 20(3):619-27. doi:10.1093/oxfordjournals.aje.a118098.
- , Herbert L. Ratcliffe, and Cretyl Crumb. 1948. “On the Mechanics of Droplet Nuclei Infection. II. Quantitative Experimental Air-Borne Tuberculosis in Rabbits.” *Am J Epidemiol* 47(1):11-28.
- , Joseph Stokes Jr., Mildred W. Wells, et al. 1940. “Experiments in the Environmental Control of Epidemic Respiratory Infection.” *Trans Stud Coll Physicians Phila* 4(February):342-5.
- , Mildred W. Wells, and Stuart Mudd. 1939. “Infection of Air: Bacteriologic and Epidemiologic Factors.” *Am J Public Health Nations Health* 29(8):863-80. doi:10.2105/ajph.29.8.863.
- , Mildred W. Wells, and Theodore S. Wilder. 1942. “The Environmental Control of Epidemic Contagion: I. An Epidemiologic Study of Radiant Disinfection of Air in Day Schools.” *Am J Epidemiol* 35(1):97-121. doi:10.1093/oxfordjournals.aje.a118789.
- Wenzel, Richard P. 2003. *Prevention and Control of Nosocomial Infections*. Philadelphia, PA: Lippincott Williams & Wilkins.
- Westminster Medical Society. 1832. “Final Debate on the Cholera at the Westminster Medical Society.” *Lancet* 2:146-50.
- Wever, Peter C., and Leo van Bergen. 2014. “Death from 1918 Pandemic Influenza During the First World War: A Perspective from Personal and Anecdotal Evidence.” *Influenza Other Respir Viruses* 8(5):538-46. doi:10.1111/irv.12267.
- Weyer, Jacqueline, Antoinette Grobbelaar, and Lucille Blumberg. 2015. “Ebola Virus Disease: History, Epidemiology and Outbreaks.” *Curr Infect Dis Rep* 17(5):480. doi:10.1007/s11908-015-0480-y.
- Weyrauch, Friedrich, and Johannes Rzymkowski. 1938. “Photographien zur Tröpfcheninfektion.” *Zschr Hyg* 120(5):444-9.
- Wheat, Richard P., Anne Zuckerman, and Lowell A. Rantz. 1951. “Infection Due to Chromobacteria: Report of Eleven Cases.” *AMA Arch Intern Med* 88(4):461-6. doi:10.1001/archinte.1951.03810100045004.

Wheeler, S. M., Hollis S. Ingraham, Alexander Hollaender, et al. 1945. "Ultra-Violet Light Control of Air-Borne Infections in a Naval Training Center: Preliminary Report." *Am J Public Health* 35(5):457-68. doi:10.2105/ajph.35.5.457.

Wheelis, Mark. 2002. "Biological Warfare at the 1346 Siege of Caffa." *Emerg Infect Dis* 8(9):971-5. doi:10.3201/eid0809.010536.

—, Lajos Rózsa, and Malcolm Dando. 2006. *Deadly Cultures: Biological Weapons Since 1945*. Cambridge, MA: Harvard University Press.

Whipple, George C. 1921. "The Public Health Work of Professor Sedgwick." *Science* 53(1365):171-8. doi:10.1126/science.53.1365.171.

Whitby, Simon M. 2002. *Biological Warfare Against Crops*. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan.

White House. 2020a. "15 Days to Slow the Spread." <https://trumpwhitehouse.archives.gov/articles/15-days-slow-spread/>.

—. 2020b. "Remarks By President Trump, Vice President Pence, and Members of the Coronavirus Task Force in Press Briefing." <https://trumpwhitehouse.archives.gov/briefings-statements/remarks-president-trump-vice-president-pence-members-coronavirus-task-force-press-briefing-18/>.

—. 2021a. "Remarks By President Biden on the Covid-19 Response and Vaccination Program." <https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/06/02/remarks-by-president-biden-on-the-covid-19-response-and-vaccination-program/>.

—. 2021b. "Remarks By President Biden on the 100 Million Shot Goal." <https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/03/18/remarks-by-president-biden-on-the-100-million-shot-goal/>.

—. 2022. "White House Summit on Indoor Air Quality." *YouTube*, October 12, 2022. <https://www.youtube.com/watch?v=q1HCG1aXaBg>.

Wilder, Theodore S. 1935. "A School Physician Studies Contagious Diseases." *Child Educ* 11(5):199-204. doi:10.1080/00094056.1935.10723954.

Wilke, Carolyn. 2022. "A Conversation with Richard Corsi." *ACS Cent Sci* 8(5):502-3. doi:10.1021/acscentsci.2c00500.

Wilkins, H. F. 1938. "Clipper Vanishes on Pacific Flight; Vast Hunt Futile." *New York Times*, July 30, 1938.

Williams, Claire G. 2010. "Long-Distance Pine Pollen Still Germinates After Meso-Scale Dispersal." *Am J Bot* 97(5):846-55. doi:10.3732/ajb.0900255.

Williams, David M., and Robert Huxley. 1998. "Christian Gottfried Ehrenberg (1795-1876): The Man and His Legacy. An Introduction." *Linnean* 1:1-13.

Williams, Ralph C. 1951. *The United States Public Health Service, 1798-1950*. Washington, DC: Commissioned Officers Association of the U.S. Public Health Service.

- Willis, Elizabeth A. 2002. "Landscape with Dead Sheep: What They Did to Gruinard Island." *Med Confl Surviv* 18(2):199-210. doi:10.1080/13623690208409625.
- Wilson, Catherine. 1995. *The Invisible World: Early Modern Philosophy and the Invention of the Microscope*. Princeton, NJ: Princeton University Press.
- Wilson, Daniel J. 2015. "Basil O'Connor, the National Foundation for Infantile Paralysis and the Reorganization of Polio Research in the United States, 1935-41." *J Hist Med Allied Sci* 70(3):394-424. doi:10.1093/jhmas/jru003.
- Wilson, Eric G. 2005. "Shelley and the Poetics of Glaciers." *Wordsworth Circle* 36(2):53-6. doi:10.1086/TWC24045108.
- Wilson, Mark. 2020. "The Untold Origin Story of the N95 Mask." *Fast Company*, March 24, 2020. <https://www.fastcompany.com/90479846/the-untold-origin-story-of-the-n95-mask>.
- Wilson, Reid. 2018. *Epidemic: Ebola and the Global Scramble to Prevent the Next Killer Outbreak*. Washington, DC: Brookings Institution Press.
- Winslow, Charles-Edward Amory. 1967. *The Conquest of Epidemic Disease*. New York, NY: Hafner.
- Wolf, Marin. 2022. "How a \$100 Box Is Changing the Way People Protect Themselves Against Coronavirus." *Dallas Morning News*, August 23, 2022.
- Wood, Lauren F. 2021. "Leading Experts Call for Immediate Action to Address Inhalation Exposure to Prevent COVID-19." *UCSD*, February 17, 2021. <https://today.ucsd.edu/story/leading-experts-call-for-immediate-action-to-address-inhalation-exposure-to-prevent-covid-19-infecti>.
- Woodham-Smith, Cecil B. 1962. *The Great Hunger: Ireland 1845-1849*. New York, NY: Harper & Row.
- Woodward, Bob. 2020. *Rage*. New York, NY: Simon & Schuster.
- Woodward, Theodore E. 1990. *The Armed Forces Epidemiological Board: Its First Fifty Years*. Washington, DC: U.S. Office of the Surgeon General, Department of the Army.
- World Health Organization. 2006. *SARS: How a Global Epidemic Was Stopped*. <https://apps.who.int/iris/handle/10665/207501>.
- . 2014a. "H5N1 Highly Pathogenic Avian Influenza: Timeline of Major Events." https://cdn.who.int/media/docs/default-source/influenza/avian-and-other-zoonotic-influenza/h5n1_avian_influenza_update20141204.pdf?sfvrsn=d1846969_5.
- . 2014b. "Infection Prevention and Control of Epidemic- and Pandemic-Prone Acute Respiratory Infections in Health Care." <https://www.who.int/publications/i/item/10665-112656>.
- . 2018. "2018 Annual Review of Diseases Prioritized Under the Research and Development Blueprint." <https://www.who.int/news-room/events/detail/2018/02/06/default-calendar/2018-annual-review-of-diseases-prioritized-under-the-research-anddevelopment-blueprint>.

- _____. 2019a. *Global Tuberculosis Report 2019*.
<https://www.who.int/publications/i/item/9789241565714>.
- . 2019b. “WHO Guidelines on Tuberculosis Infection Prevention and Control: 2019 Update.”
<https://apps.who.int/iris/handle/10665/311259>.
- . 2020a. “Coronavirus Disease (Covid-19) Advice for the Public.”
<https://web.archive.org/web/20200221195248/https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>.
- . 2020b. “Coronavirus Press Conference 11 February, 2020.”
<https://www.who.int/docs/default-source/coronaviruse/transcripts/who-audio-emergencies-coronavirus-full-press-conference-11feb2020-final.pdf>.
- . 2020c. “Modes of Transmission of Virus Causing Covid-19: Implications for IPC Precaution Recommendations.” <https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations>.
- . 2020d. “Report of the Who-China Joint Mission on Coronavirus Disease 2019 (Covid-19).”
[https://www.who.int/publications/i/item/report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-\(covid-19\)](https://www.who.int/publications/i/item/report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-(covid-19)).
- . 2020e. “Transmission of Sars-Cov-2: Implications for Infection Prevention Precautions.”
<https://web.archive.org/web/20200709182242/https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions>.
- . 2020f. “Virtual Press Conference 7 July 2020.” <https://www.who.int/docs/default-source/coronaviruse/transcripts/virtual-press-conference---7-july---covid-19.pdf>.
- . 2021. “WHO Recommendations on Mask Use By Health Workers, in Light of the Omicron Variant of Concern.” https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC_Masks_Health_Workers-Omicron_variant-2021.1.
- . 2023a. “A 30-Fold Rise of Measles Cases in 2023 in the WHO European Region Warrants Urgent Action.” <https://www.who.int/europe/news/item/14-12-2023-a-30-fold-rise-of-measles-cases-in-2023-in-the-who-european-region-warrants-urgent-action>.
- . 2023b. “Statement on the Fifteenth Meeting of the IHR (2005) Emergency Committee on the Covid-19 Pandemic.” [https://www.who.int/news/item/05-05-2023-statement-on-the-fifteenth-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-coronavirus-disease-\(covid-19\)-pandemic](https://www.who.int/news/item/05-05-2023-statement-on-the-fifteenth-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-coronavirus-disease-(covid-19)-pandemic).
- . 2023c. “Tuberculosis Fact Sheet.” <https://www.who.int/news-room/fact-sheets/detail/tuberculosis>.
- . 2023d. “WHO Director-General’s Opening Remarks At the Media Briefing – 5 May 2023.”
<https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing---5-may-2023>.

Wright, Lawrence. 2021. *The Plague Year: America in the Time of Covid*. New York, NY: Knopf.

- Wright, Susan. 1990. *Preventing a Biological Arms Race*. Cambridge, MA: MIT Press.
- . 2007. “Terrorists and Biological Weapons: Forging the Linkage in the Clinton Administration.” *Politics Life Sci* 25(1-2):57-115. doi:10.2990/1471-5457(2006)25[57:TABW]2.0.CO;2.
- Wu, Dong, Ling Jin, Jiawen Xie, et al. 2022. “Inhalable Antibiotic Resistomes Emitted from Hospitals: Metagenomic Insights into Bacterial Hosts, Clinical Relevance, and Environmental Risks.” *Microbiome* 10(1):19. doi:10.1186/s40168-021-01197-5.
- Wu, Lien-Teh. 1926. *A Treatise on Pneumonic Plague*. Nancy: Berger-Levrault.
- . 1959. *Plague Fighter: The Autobiography of a Modern Chinese Physician*. Cambridge: W. Heffer.
- Wuhan Municipal Health Commission. 2019. “Wuhan Municipal Health Commission’s Briefing on the Current Pneumonia Epidemic Situation in Our City.” December 31, 2019. <https://web.archive.org/web/20200106064908/http://wjw.wuhan.gov.cn:80/front/web/showDetail/2019123108989>.
- Wyatt, Vivian. 1978. “Maladie De Bradford—After 100 Years.” *New Scientist* 192-4.
- Xia, Rosanna. 2020. “Beachgoers Beware: Virus May Be Lurking.” *Los Angeles Times*, April 3, 2020.
- Xiao, Hong, Zhicheng Wang, Fang Liu, et al. 2023. “Excess All-Cause Mortality in China After Ending the Zero COVID Policy.” *JAMA Netw Open* 6(8):e2330877. doi:10.1001/jamanetworkopen.2023.30877.
- Yam, Kimmy. 2020. “Taiwanese Immigrant Who Invented N95 Mask on Working Amid COVID-19 Racism.” *NBC News*, July 15, 2020. <https://www.nbcnews.com/news/asian-america/taiwanese-immigrant-who-invented-n95-mask-working-amid-covid-19-n1233777>.
- Yan, Jing, Michael Grantham, Jovan Pantelic, et al. 2018. “Infectious Virus in Exhaled Breath of Symptomatic Seasonal Influenza Cases from a College Community.” *Proc Natl Acad Sci U S A* 115(5):1081-6. doi:10.1073/pnas.1716561115.
- Yang, Dali L. 2022a. “China’s Zero-COVID Campaign and the Body Politic.” *Current Hist* 121(836):203-10. doi:10.1525/curh.2022.121.836.203.
- . 2022b. “The Shanghai Lockdown and the Politics of Zero-Covid in China.” In *Party Watch Annual Report 2022: Seeking Progress While Maintaining Stability*. Edited by Molly Henry. Washington, DC: Center for Advanced China Research.
- . 2024. *Wuhan: How the COVID-19 Outbreak in China Spiraled Out of Control*. Oxford: Oxford University Press.
- Yang, Jeff. 2014. “A Quick History of Why Asians Wear Surgical Masks in Public.” *Quartz*, November 19, 2014. <https://qz.com/299003/a-quick-history-of-why-asians-wear-surgical-masks-in-public>.
- Yang, Wan, and Linsey C. Marr. 2011. “Dynamics of Airborne Influenza a Viruses Indoors and Dependence on Humidity.” *PLoS One* 6(6):e21481. doi:10.1371/journal.pone.0021481.

—, Subbiah Elankumaran, and Linsey C. Marr. 2011. “Concentrations and Size Distributions of Airborne Influenza A Viruses Measured Indoors at a Health Centre, a Day-Care Centre and on Aeroplanes.” *J R Soc Interface* 8(61):1176-84. doi:10.1098/rsif.2010.0686.

Yang, Yang. 2020. “Leading the Fight.” *China Daily*, February 13, 2020. https://www.chinadaily.com.cn/a/202002/13/WS5e4490d9a3101282172771ec_1.html.

Yorio, Kara. 2022. “Corsi-Rosenthal Boxes Help Clear the Air at Schools Across the Country.” *School Library Journal*, February 4, 2022. <https://www.slj.com/story/Corsi-Rosenthal-boxes-help-clear-the-air-at-schools-across-the-country>.

Yu, Ignatius T. S., Tze W. Wong, Yuk L. Chiu, et al. 2005. “Temporal-Spatial Analysis of Severe Acute Respiratory Syndrome Among Hospital Inpatients.” *Clin Infect Dis* 40(9):1237-43. doi:10.1086/428735.

—, Yuguo Li, Tze W. Wong, et al. 2004. “Evidence of Airborne Transmission of the Severe Acute Respiratory Syndrome Virus.” *N Engl J Med* 350(17):1731-9. doi:10.1056/NEJMoa032867.

Yuan, Yao, Ma Yujie, Zhou Jialu, et al. 2020. “Chinese Doctor Recalls First Encounter With Mysterious Virus.” *XinhuaNet*, April 16, 2020. http://www.xinhuanet.com/english/2020-04/16/c_138982435.htm.

Zadoks, J. C. 1985. “Cereal Rusts, Dogs and Stars in Antiquity.” *Cereal Rusts Bull* 13(1):1-10.

Zaki, Ali M., Sander van Boheemen, Theo M. Bestebroer, et al. 2012. “Isolation of a Novel Coronavirus from a Man with Pneumonia in Saudi Arabia.” *N Engl J Med* 367(19):1814-20. doi:10.1056/NEJMoa1211721.

Zelner, Jon, Rob Trangucci, Ramya Naraharisetti, et al. 2021. “Racial Disparities in Coronavirus Disease 2019 (COVID-19) Mortality Are Driven by Unequal Infection Risks.” *Clin Infect Dis* 72(5):e88-95. doi:10.1093/cid/ciaa1723.

Zhang, Meng. 2023. “Mass Masking Without Mandates—The Role of Gender in Mask Use in China.” *N Engl J Med* 389(10):874-5. doi:10.1056/NEJMp2303552.

Zhang, Nan, Yong Guo, Benjamin J. Cowling, et al. 2023. “Explosive Household Spread of the SARS-CoV-2 Omicron Variant and Associated Risk Factors in China in Late 2022.” *SSRN*. doi:10.2139/ssrn.4458033.

Zhao, Z., F. Zhang, M. Xu, et al. 2003. “Description and Clinical Treatment of an Early Outbreak of Severe Acute Respiratory Syndrome (SARS) in Guangzhou, PR China.” *J Med Microbiol* 52(Pt 8):715-20. doi:10.1099/jmm.0.05320-0.

Zilinskas, Raymond A. 1997. “Iraq’s Biological Weapons. The Past as Future?” *JAMA* 278(5):418-24. doi:10.1001/jama.1997.03550050080037.

Zimmer, Amy, and Christina Veiga. 2020. “Seeking Safer Classrooms, NYC Teachers Are Crowdfunding for Air Purifiers.” *Chalkbeat*, November 4, 2020. <https://www.chalkbeat.org/newyork/2020/11/4/21550031/ventilation-teachers-air-purifiers-donorschoose>

Zimmer, Carl. 2019. "Ebola, H.I.V., Spanish Flu, SARS—The 20th Century's Deadliest Hits." *New York Times*, June 5, 2019.

Zucconi, Laura M. 2019. *Ancient Medicine: From Mesopotamia to Rome*. Grand Rapids, MI: William B. Eerdmans Publishing Co.