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The dream that never dies: the ideals and realities of cosmopolitanism in science, 1870–1940*

Abstract

In the half-century before the Great War, collaborative international ventures in science became increasingly common. The trend, manifested in scientific congresses and attempts to establish agreement on physical units and systems of nomenclature, had important consequences.

One was the fear of information overload. How were scientists to keep abreast of the growing volume of books, journals, and reports? How were they to do so in an era without

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a common language? Responses to these challenges helped to foster new departures in cataloguing, bibliography, and an interest in Esperanto and other constructed languages.

By 1914, the responses had also become involved in wider movements that promoted communication as a force for peace.

The Great War dealt a severe blow to these cosmopolitan ideals, and the post-war reordering of international science did little to resurrect them.

A "national turn" during the 1920s assumed a darker form in the 1930s, as totalitarian regimes in the Soviet Union, Italy, Germany, and Spain associated science ever more closely with national interests.

Although the Second World War further undermined the ideal of internationalism in science, the vision of science as part of a world culture open to all soon resurfaced, notably in UNESCO.

As an aspiration, it remains with us today, in ventures for universal access to information made possible by digitization and the World Wide Web.

The challenge in the twenty-first century is how best to turn aspiration into reality.

Keywords: *Alexandre Koyré Medal for 2016*, *Robert Fox*, *The International Academy of the History of Science*, *The European Society for the History of Science*, *Prague*, *cosmopolitanism*, *national interests*, *the world of learning, 1870–1940*, *UNESCO.*

International Academy of the History of Science. I am grateful to the ESHS and the Academy for their invitation, which allowed me to present work that has since been published more fully in Robert Fox, *Science without Frontiers. Cosmopolitanism and National Interests in the World of Learning, 1870–1940* (2016).

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Marzenie, które nigdy nie umiera: ideały i realia kosmopolityzmu w nauce w latach 1870–1940

Abstrakt

Pół wieku przed pierwszą wojną światową coraz powszechniej zaczęły się pojawiać wspólne przedsięwzięcia naukowe. Ta tendencja, przejawiająca się w organizowaniu kongresów naukowych oraz próbach osiągnięcia porozumienia w sprawie jednostek fizycznych i systemów nomenklatury naukowej, miała istotne konsekwencje.

Jedną z nich był lęk przed przeładowaniem informacji. Jak naukowcy mieli być na bieżąco z coraz większą liczbą książek, czasopism i raportów? Jak mieli temu podołać nie korzystając ze wspólnego języka? Odpowiedzi na te wyzwania pomogły pobudzić nowe kierunki w katalogowaniu, tworzeniu bibliografii oraz zainteresowaniu Esperanto i innymi językami konstruowanymi.

Do roku 1914, odpowiedzi te wiązały się także z szerszymi ruchami społecznymi, które promowały komunikację międzynarodową jako narzędzie do utrwalania pokoju. Pierwsza wojna światowa zadała poważny cios tym kosmopolitycznym ideałom, a powojenne przekształcenie porządku międzynarodowej nauki niewiele zrobiło, by je odtworzyć.

Zwrot w stronę nacjonalizmu w latach 20. XX wieku przybrał bardziej mroczną formę w latach 30. XX wieku, ponieważ totalitarne reżimy w Związku Radzieckim, Włoszech, Niemczech i Hiszpanii wiązały się coraz ściślej z narodowymi interesami.

Choć druga wojna światowa jeszcze bardziej podważyła ideał internacjonalizmu w nauce, wkrótce wskrzeszono, szczególnie w UNESCO, wizję nauki jako elementu światowej kultury otwartej dla wszystkich.

Do tego ideału aspirujemy również i dziś, dążąc do powszechnego dostępu do informacji za pomocą digitalizacji i sieci WWW. Wyzwaniem w XXI wieku jest jak najlepiej przekształcić tę aspirację w rzeczywistość.

Słowa kluczowe: *Medal Alexandre'a Koyré'ego w 2016 r., Robert Fox, The International Academy of the History of Science, The European Society for the History of Science, Praga, kosmopolityzm, narodowe interesy, świat nauki, 1870–1940, UNESCO.*

1. Introduction: cosmpolitanism and the culture of science

Among the many forms of learned culture, science has conventionally had a special place. It has been seen as resting on reason, observation, experiment, i.e. on sources of knowledge to which all of us have access, regardless of race, nation, or language. As historians today, we might view the scientific enterprise rather differently. But the commonly held view of science is something with which we have to engage, as I have tried to do in some of my recent work.[1] What interests me is just how resilient the perception of science as a universal, intrinsically cosmopolitan culture has been and still is. Given the interests, especially the national interests, that have worked against that perception, the striking thing is that it survives at all and does so in certain periods with particular force.

It is not immediately obvious why this should be: why scientific cosmopolitanism has sometimes been in the ascendant, at other times on the back foot. Pursuing that thought, I look at two contrasting periods between about 1870 and the 1940s. In one of these, up to the Great War, cosmopolitan ideals in science were voiced with confidence, as self-evidently proper and, at least in principle, realizable. In the other period, essentially the two decades between the two world wars, those same ideals were questioned, often rejected as unrealistic or more often simply ignored. In setting up this contrast, I do not imply that scientific cosmopolitanism first appeared in the mid-nineteenth century or that it was only challenged during the inter-war years. The fact is that cosmopolitanism and national interests have co-existed since at least the seventeenth century and that the history of the interaction between them has been one of a constantly shifting balance. My aim, therefore, is simply to explore the shift that occurred between the pre-Great War and post-Great War periods and to argue for its significance in the wider history of international relations in science.

2. Cosmopolitanism in the ascendant

I begin with the tide of what has been variously described as cosmopolitan, universal, international, or transnational sentiment that got under

[1] For example cf. Fox 2016.

way in the mid-nineteenth century, in particular from the 1870s. An important concrete manifestation of the sentiment in the sciences was the number of new ventures that called for collaboration and the free movement of information across national boundaries. The Carte du Ciel project, begun in Paris in 1887, was a prime example: the preparation of a definitive map of millions of stars down to 11th magnitude in both hemispheres engaged 22 observatories across the world, all of them committed to the regular exchange of readings and the acceptance of shared norms of procedure and reporting.[2]

New collaborative ventures in geodesy and meteorology conveyed a similar spirit; these sciences simply did not make sense unless observations became the common property of the relevant disciplinary communities everywhere. It is no coincidence that in these same years (in 1875) the new International Bureau of Weights and Measures was established, just outside Paris, to determine and monitor universal definitions and standards in accordance with the recently signed international convention on the metre.[3] It is no coincidence either that, from the 1870s, international scientific congresses proliferated, many of them in pursuit of agreements about zoological, botanical, and chemical nomenclature and physical units.[4]

All these initiatives brought with them problems as well as benefits. One conspicuous problem was that they generated paper, in the form of congress proceedings, working party reports, and academic articles. These accelerated what the historian Derek John de Solla Price identified in the 1960s as one of the "diseases" of science.[5] Price was referring to the exponential growth he identified in the number of journals and papers, especially from the mid-nineteenth century. The proliferation reflected a fundamental change in academic career-making. Scientists now increasingly advanced their reputations and careers through publications in specialized journals, and far less by correspondence, talking, or face-to-face contact.[6] The career of the Scottish physicist

[2] On the Carte du Ciel, see Debarbat *et al.* (eds.) 1988, pp. 9–148, part I ("Historical research") and Lamy (ed.) 2008.

[3] Quinn 2012, pp. 26–172.

[4] Rasmussen 1990, pp. 115–133.

[5] De Solla Price 1975, pp. 161–195.

[6] Csiszar 2010, pp. 399–434.

William Thomson (later Lord Kelvin) exemplified the change that was afoot. By the time he died in 1907, Thomson had been publishing for over sixty years, in which time he wrote some 700 papers. Given that level of productivity, how could anyone, including specialists in the areas of Thomson's work, hope to keep up with him?[7]

While contemporaries would not have used the term "information overload", that is what they faced. The experience, though, was not new. As Ann Blair told us some years ago, it has been with us since early modern times, even earlier.[8] But in the later nineteenth century, a long-standing problem turned into a crisis. The cumulative number of books published since the birth of printing rose from three million in 1800 to three times that figure a century later.[9] And the flow of journal articles increased even more dramatically, stimulating the emergence of the first abstracting journals (such as the German Chemisches Zentralblatt, launched in 1830) and widely diffused bibliographies and catalogues. In scientific journals, extended bibliographical supplements became routine. Supreme in its coverage, however, was the International Catalogue of Scientific Literature, an annual listing of publications in seventeen disciplines that survived from 1902 until it succumbed to the effects of the Great War in 1914.

In obvious ways, the proliferation of initiatives in bibliography and cataloguing responded to the challenge of the sheer volume of printed materials to be assimilated and ordered. But other incentives were at work as well, especially from the 1880s. Among these was a widely shared conviction that the free exchange of information was an indispensable condition for world peace, threatened as this now was by mounting tensions in the European nations' competitive "scramble" for colonies in Africa and by what eventually emerged as the Balkan Wars of 1912–1913.

Among those whose bibliographical interests were fired by this higher ideal were two of the great peace campaigners of the age: Paul Otlet and Henri La Fontaine. Both men were Belgian lawyers, and both were committed to the promotion of international understanding in all its forms.

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[7] De Solla Price 1975, pp. 176n.
[8] Blair 2010.
[9] Otlet 1934, pp. 38–39.

Of the two, Otlet was the more retiring: the technician, the cataloguer, the back-room boy.[10] La Fontaine was more urbane, a Belgian senator, winner of the Nobel Prize for Peace in 1913, and in due course a member of the Belgian delegation at the Paris Peace Conference of 1919 and subsequently in the League of Nations General Assembly.[11] Pooling their complementary gifts, Otlet and La Fontaine founded the most ambitious bibliographical enterprise of the age, the Institut International de Bibliographie, in Brussels in 1895. The institute was a meticulously ordered affair of card cabinets, call numbers, and rigid procedures for cataloguing not only books but also articles, images, manuscripts, sound recordings, in fact any artefact that could be construed as a source of information. Overseeing it all was Otlet himself; under him, by 1914, a staff of more than twenty was processing up to 2000 cards a day: 11 million of them by the time the Great War effectively curtailed activity.

In the words of a recent biography, Otlet set out to "catalogue the world", with all that a true "world" catalogue implied.[12] Among the many challenges he faced was that of language. By the late nineteenth century, Latin was long dead as the lingua franca of the learned world. In the sciences, German was comfortably in the lead, followed by English, and then by French. At international gatherings as in publications, however, there were few scientists who mastered all three of them. In principle, any one of the leading languages might have been chosen as the agreed standard. But such an arbitrary choice was politically out of the question. The alternative was a new language. Among several so-called "constructed" languages, the three main contenders (all of them devised, significantly, in the late nineteenth and very early twentieth centuries) were Volapük ("world speak" in Volapük). Esperanto ("hopeful"), and Ido (a variant of Esperanto, said to be especially appropriate for science).[13] Predictably, the idea of a universal auxiliary language at-

[10] In a growing literature on Otlet, the pioneering work by W. Boyd Rayward remains an essential resource. See Rayward 1975 and 2016, also the two more recent studies cited in footnote 12 below.

[11] Aspects of La Fontaine's work are well treated in the volume of essays: Archer *et al.* 2012.

[12] Wright 2014. Cf. the similar perception of Otlet's ambitions in Levie 2006.

[13] On these languages and more generally on scientific communication after the demise of Latin as the common language of the world of learning, see Gordin 2015,

tracted Otlet and La Fontaine, and they declared their support for Esperanto, though without ever learning it.

In their bibliographical enterprise as in their other initiatives aimed at promoting international understanding, Otlet and La Fontaine were giving concrete expression to their overriding goal of world peace. In pursuit of the goal, they had prominent allies, among them in science the Latvian-born German chemist Wilhelm Ostwald and the German astronomer Wilhelm Foerster. Both Ostwald and Foerster were leading figures in the peace movement, and both, like Otlet and La Fontaine, rested their hopes on the free movement of knowledge, whether through the printed word or through personal contacts in congresses and collaborative international projects. Ostwald's involvement in the promotion of Ido and Foerster's work for the International Esperanto Society and the Bureau International des Poids et Mesures conveyed precisely the commitment that Otlet and La Fontaine sought to foster from Brussels in the Institut International de Bibliographie.

3. The Great War as watershed

By the eve of the Great War the cosmopolitan spirit, with its inalienable objective of world peace, had achieved unprecedented momentum. The strength of the movement was encapsulated most luxuriously in 1913 in a magnificent privately printed volume, *Creation of a World Centre of Communication* by the Norwegian-American artist and visionary Hendrik Christian Andersen. Co-authored with the Parisian architect Ernest Hébrard, the book presented a grand architectural project for an international city devoted to communication in all its forms.[14] Ease of travel, facilities for congresses, and installations for printing, publication, and telegraphy were central to the plan. The extravagance of the scheme, fired by Andersen's unbridled imagination, invited ridicule, not least from Andersen's close friend Henry James. And the project came

esp. pp. 131–158. It is a mark of the international character of the constructed languages movement that Volapük was created by a German priest Johann Martin Schleyer (1831–1912), and Esperanto by a Polish physician and Jewish activist Ludwik Zamenhof (1859–1917), while Ido was primarily championed by two French academics: Louis Couturat (1868–1914) and Léopold Leau (1868–1943).

[14] Andersen, Hébrard 1913.

to nothing, the victim both of its own ambition and, with fatal irony, of the war that followed within a year of its publication.

Despite its grandiose scale, the core aspirations of Andersen's plan were shared far beyond his immediate world of aesthetes and literary intellectuals. But any hope that scientists might be among the natural sympathizers was soon dashed. From the moment war began, the scientific communities of the belligerent nations took sides, most publicly and notoriously in the declaration by 93 German intellectuals, among them sixteen past or future Nobel Prizewinners in science, of the justness of Germany's cause and actions, including the widely condemned destruction of Louvain's historic university and library.[15] The declaration, cast as a call to the "civilized world", was the first major salvo in what has been variously called the *Krieg der Geister* or *Krieg der Gelehrten*, a war between intellectuals, and it provoked outrage in the Allied countries.[16] What followed was a wave of sustained reciprocal disparagement promoted by academies and individual scientists and others who, until the war, had subscribed wholeheartedly to the perception of the world of learning as a seamless web. The German chemist and pioneer of gas warfare, Fritz Haber, expressed the new antagonistic spirit in his much-quoted assertion that "During peacetime a scientist belongs to the world, during war he belongs to his nation".[17] And just as Haber devoted himself to the science of poisonous gases, so others on both sides directed their research to their own country's war effort.

Once the conflict was over, the victorious Allies invoked the declaration of the 93 and German scientists' engagement in war work in initiatives aimed at the marginalization of the Central Powers. In 1918–1919,

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[15] On the writing and impact of the manifesto, see J. and W. von Ungern-Sternberg 1996. The original German text, with early drafts, and French and English translations are on pp. 156–164.

[16] Kellermann (ed.) 1915.

[17] The source of Haber's comment is hard to identify. But he expressed a similar sentiment in a valedictory statement as director of the Kaiser Wilhelm Institute for Physical Chemistry and Electrochemistry in Berlin, which he described (in 1933) as having been "dedicated to serving humanity in times of peace, and the fatherland in times of war"; see Charles 2005, pp. 232–233. I am grateful to Joseph Gal for this lead. After the Second World War, Haber's position was given further expression when, on 1 July 1953 (under the directorship of Max von Laue), the Max Planck Society's scientific unit was renamed the Fritz Haber Institute – cf. Päsler 1960, p. 566.

a succession of three major conferences of Allied scientists resulted in the decision to exclude Germany, Austria, Bulgaria, and the Ottoman Empire from the newly formed International Research Council and the IRC's affiliated unions with responsibility for the different scientific disciplines.[18] The German language too was to be outlawed, forbidden as a vehicle for communication at congresses under the IRC's aegis. For the ideology of openness that had exerted such a profound influence on science since the seventeenth century, the moves came as a bitter blow.

In the face of such divisive measures, normal scientific relations, including many personal friendships, were hard-pressed to survive. The impact on science was all too evident, even in contexts that were not formally subject to the IRC's ban. The German participants who had been so prominent in the first Solvay conference of leading physicists in 1911 were absent from the conferences of 1921 and 1924, and only returned in the more conciliatory atmosphere of 1927. Germany was similarly unrepresented at the first Solvay conference on chemistry in 1922. Since many German scientists made new alliances to the east, notably with colleagues in Russia, which side suffered more from the exclusion is an open question. Certainly chemists in the Allied countries were left to lament the effect on a discipline in which almost half of the publications listed in *Chemical Abstracts* just before the war had been in the now forbidden language of German.[19]

What had occurred was part of a "national turn" that had helped to give science virtually everywhere a new prominence in the apparatus of state, at the expense of its status as a form of universal knowledge that, at least in principle, transcended political differences. Some consequences of the turn were beneficial. The establishment of the Italian Consiglio Nazionale delle Ricerche in 1923 was a good example of how a strengthening of governmental engagement could benefit research.[20] In Britain, the Department of Scientific and Industrial Research, a wartime creation, similarly did much to promote the areas of science and technology that it favoured.[21] But the fact remained that

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[18] Greenaway 1996, pp. 19–32.
[19] Reinbothe 2006, p. 35.
[20] Tomassini 2001.
[21] Alter 1987, pp. 201–213.

the old cosmopolitanism of science, though never perfect, had been gravely weakened.

In more subtle ways, celebrations of scientific heroes too reflected the change. After the war, these preserved something of the universal tone that had almost always characterized them: eulogies of individual achievements went hand in hand with evocations of associated advances, in human knowledge or welfare, that benefited all peoples. Yet a more assertive patriotic sentiment was unmissable, especially (though not only) in countries that had participated in the conflict. In France, the strikingly grandiose events to mark the centenaries of the birth of Louis Pasteur (in 1922–1923, mainly held in the newly recovered city of Strasbourg) and Marcellin Berthelot (1927, in Paris) illustrate the point, as do the scientific and technological sections of the British Empire Exhibition in London in 1924–1925 and the inauguration in 1928 of the Tempio Voltiano in Como, to house the surviving instruments and papers of Alessandro Volta.[22]

4. Totalitarian science

Such initiatives were harmless enough. But in the 1930s, the interest of totalitarian regimes in the politics of culture raised disturbing problems for science, as for other areas of the world of learning. Nowhere were the consequences more evident or damaging than in Nazi Germany. The Deutsches Museum in Munich was a particular target for politically motivated criticism from the earliest days of Hitler's Chancellorship.[23] Hitler himself viewed the museum as insufficiently patriotic in its displays. In a clear rebuke to the more internationalist perspectives of the museum's founder, Oskar von Miller, he laid plans for the construction of a new "Haus der deutschen Technik", within sight of the Deutsches Museum, that would be exclusively devoted to German achievements in technology.[24]

In the event, Hitler's plans came to nothing. But supporters of the Nazi cause found other ways of promoting a vision of a German national tradition in science. Philipp Lenard, the author of the four-volume

[22] Fox 2016, pp. 81–92.
[23] Vaupel, Wolff (eds.) 2010.
[24] Uekötter 2010, pp. 225–229.

textbook of physics, *Deutsche Physik* (1936–1937), made the point explicitly in a *Preface* that contrasted the excellence of Aryan, and hence truly German, physics with the theoretical falsehoods and fantasies of Jewish physics.[25] The result was an otherwise competent manual of experimental physics, by an eminent Nobel Prizewinner (1905), that had no place for relativity or quantum mechanics.

Jewish scientists suffered in other, all too familiar ways as well, and not only in Germany. Exclusions from academic positions in German universities had their counterparts in Mussolini's Italy, where Vito Volterra's refusal to swear allegiance to the fascist state resulted in the loss of his chair at the University of Rome (in 1931) and his removal from the Accademia Nazionale dei Lincei (in 1934).[26] On the political left, totalitarianism did no less damage, albeit with different motivations and in different forms. In the Soviet Union the ascendancy of Stalin from the late 1920s was the prelude to harassment ranging from dismissal from key academic posts to execution, with long-term consequences that were to be manifested after the Second World War in the disastrous promotion of Lysenkoism and the rejection of mainstream genetics as a pseudoscience.[27]

By the mid-1930s, any surviving belief that science and scientists could go their way independently of the political regimes on which they increasingly depended for material support and legitimation was fragile and under threat. The international exhibition of 1937 in Paris offered spectacular evidence of the extent to which science and technology had come to be embedded in the web of nations' interests. In an event devoted to the theme of "arts et techniques dans la vie moderne", Nazi Germany and the Soviet Union seized the opportunity of displaying their different conceptions of science-based modernity.

The Nazi conception drew on a high-tech display including fine optical instruments from Zeiss, a state-of-the-art Mercedes racing car, and a Zeppelin motor, though in a setting that demonstrated the compatibility between advanced technology and traditional values of family and countryside. The Soviet pavilion, by contrast, stressed the fruits of the

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[25] Lenard 1936–1937, pp. ix-xi.
[26] Pancaldi 1993; Simili 2013; Guerraggio, Paoloni 2013, pp. 122–131 and 153–156.
[27] Graham 1971, pp. 3–23 and 195–256.

new socialist order: material advances that were, in principle, available to all citizens, in the manner of the technologically straightforward ZIS (Zavod imeni Stalina) car that dominated the main display hall.

The ideological confrontation was played out on the most prominent stage that the 1937 exhibition could offer. The imposing Nazi and Soviet pavilions, replete with their different messages of power, efficiency, and humanitarian beneficence, faced each other on the banks of the Seine at the foot of the Chaillot Hill. With dramatic intent, they framed the Eiffel Tower, the embodiment of the old technology and, as observers were expected to recognize, a now outdated democratic order.[28]

The contrast exemplified the unprecedented precariousness of the cosmopolitan ideal that had characterized the Republic of Letters (*Respublica literaria*) from the Renaissance, and more was soon to follow. Despite the inherent tension between the frequently deployed rhetoric of universal, cooperative endeavor in pursuit of human progress and the reality of competitive national aggrandizement, plans for the Esposizione Universale Roma (EUR) of 1942 paid lip-service to internationalist ideals, as such exhibitions had done since the first of them, the Great Exhibition of 1851 in London. The fact remains, however, that in an event planned as a celebration of the twentieth anniversary of Mussolini's march on Rome and the beginning of the Fascist era, political interests were paramount.

By 1939, plans for the exhibition were well advanced, and some building had begun. But the Second World War forced the abandonment of the EUR project.[29] With scientists recruited once again to war work, it also dealt another blow to the cosmopolitan dream. Yet even in the darkest days, vestiges of cosmopolitanism survived. With the war at its height, the English biochemist and future sinologist Joseph Needham made extended visits to unoccupied China as director of the Sino-British Science Co-operation Office between 1942 and 1946. And he emerged after the war as a leading figure in yet another initiative aimed at crossing frontiers, the United Nations Educational, Scientific, and Cultural Organization, UNESCO.

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[28] On the cultural and political context of the confrontation between Nazi and Soviet totalitarianism at the 1937 exhibition, see Fiss 2009.

[29] See Gregory *et al.* (eds.) 1987. On this and other exhibitions of the late 1930s and early 1940s, see Kargon, Fiss, Low, and Molella 2015.

5. Cosmopolitanism resurgent

The statutes of UNESCO, at its foundation in 1946, expressed a belief in "humanity's moral and intellectual solidarity" to which universalists of the generation of Otlet, La Fontaine, and Andersen would have wholeheartedly subscribed. UNESCO's guiding principles spoke (as they still do) of a transcendent "new humanism" that would help to promote the organization's overriding goal of the unfettered flow of information. The goal was one to which Needham (as head of UNESCO's scientific section) and his senior collaborator Julian Huxley, the biologist and first director-general of UNESCO, subscribed with total conviction.

In their all too brief time at UNESCO, Huxley and Needham devoted themselves to the internationalist cause. But the harsh realities of nationally defined politics were a constant and eventually destructive presence. Huxley's secular humanism and openness to the Communist world, made him suspect in the USA, and it was largely under American pressure that his term of office was reduced from the initial six years to two. In 1948 he had no choice but to resign. In the same year Needham too resigned, before returning to academic life in Cambridge. Since then, conservative critics in the USA and Britain in particular have continued to view UNESCO with suspicion and from time to time have withdrawn or reduced funding when UNESCO's transnational policies have cut across what these and some other countries have judged to be their national interests.

A pessimistic interpretation might see UNESCO's troubles as the last chapter in the inexorable victory of intellectual *Realpolitik* over the dreams that fired the long history of unrealistic hopes of a universe of information accessible to all. But if a last chapter in this story has to be written, this was not that chapter. In making my point that the cosmopolitan dream refuses to die, despite all the knocks, I conclude with an episode that is still running its course in our own day.

The episode concerns Google's plan of 2004 to digitize 15 million volumes, 4.5 billion pages, and make them available on line. As originally announced, the plan appeared breathtaking, and it captured the imagination and support of the heads of major academic collections, including the University of Michigan Library, the Widener Library at Harvard, the New York Public Library, and the Bodleian Library in Oxford. Even

the most skeptical observers gave Google credit for taking a first step. The investment, after all, promised to be large: with an initial target of 15 million titles and at a cost of, say, $50 a volume, a total expenditure in excess of $1 billion was in prospect. But the reservations soon surfaced. The figure of 15 million (though it was rather quickly achieved) fell far short of the more than 130 million titles that have been published since the beginning of printing in the fifteenth century. Given that disparity, there remained the challenge of choosing the works to be digitized and of dealing with the copyright and other problems that arise with the most recent publications. Could Google, a commercial company with a track-record of rather cavalier handling of the copyright question, be trusted to do the choosing? Might there be a temptation to favour titles, almost inevitably titles in English, that were likely to bring the most hits to the Google site? And how might such criteria be weighed against the judgements of readers, in particular of scholars who were the likeliest users of the digitized material?

These and other impediments to the dream were raised in 2005 in an incendiary book by Jean-Noël Jeanneney, at the time president of the French national library, the Bibliothèque nationale de France.[30] Jeanneney's overriding contention was that a project with the Google company's declared "mission" to "organize the world's information and make it universally accessible and useful" could not be carried through as a purely business venture, especially one that offered a monopoly to a single company.[31] The point struck home and has provoked some constructive rethinking, not least among the librarians who had made their holdings available for digitizing. It has also encouraged projects conceived rather differently from Google's. After a rather patchy start in 2008, a European network, the Europeana, has developed a multinational platform from The Hague.[32] This has given access to Euro-

[30] Jeanneney 2005; (Eng. transl.) 2007.

[31] The mission statement appeared originally as the heading to the "Company overview" page on the Google Company's website – cf. Jeanneney 2007, p. 25. Currently, the Google Books Website defines its aims differently: "Our ultimate goal is to work with publishers and libraries to create a comprehensive, searchable, virtual card catalog of all books in all languages that helps users discover new books and publishers discover new readers".

[32] See the Europeana website at http://www.europeana.eu.

pean resources in 27 countries, now with more than 50 million books, artworks, artefacts, and recordings available on line. The Digital Public Library of America, launched in 2013, set its sights rather lower: fewer than 3m items initially though now with 15 million printed ephemera, archives, and artefacts freely available.[33] Both these newer ventures have been careful not to bite off more than they can chew. Rather than a centralized digitizing programme, the model is access via platforms, with links to a wide variety of hubs, Anglophone and non-Anglophone.

My sense is that we are now on a better track. I say that, however, with caution. We must remember for how long humanity has pursued one form or another of the cosmopolitan ideal and how often, in the press of world events, the ideal has succumbed to the gulf between aspiration and fulfilment. The goal of securing unimpeded access to information remains vulnerable to the charge of naivety, as it always has been. And current debates about the implementation of Open Access agreements underline the enormity of the task ahead. But, as an optimist, I feel that we may at last be moving towards a level of access that will one day confound the title of the English translation of Jeanneney's book, in which he referred to "universal knowledge" as a "myth". Perhaps, in the age of the World Wide Web and of sites and hubs of prodigious power, tools of which Otlet and his contemporaries could barely even dream will help to turn the myth into reality. Pertinent and perceptive though Jeanneney's reservations were, we must surely hope so, especially at a time when in so many countries a resurgence of national sentiment seems set on raising rather than lowering the barriers between peoples and cultures, the very barriers against which the world of learning has struggled for so long.

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[33] The DPLA's collections are available at https://dp.la. On the launch and the library's origins and prospects, see Darnton 2013.

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