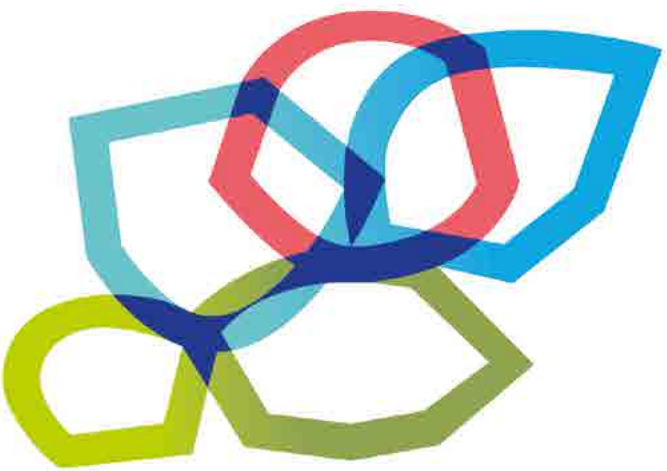
Inventing a Shared Science Diplomacy for Europe

Interdisciplinary Case Studies to Think with History

Presented by the researchers of the Horizon 2020 InsSciDE project
Under the editorial direction of

Claire Mays, Léonard Laborie, and Pascal Griset



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Introduction

Science Diplomacy: Rooted in the Long Term for More Meaningful Present-Time Action

Professor Pascal Griset
Sorbonne University (Sirice), France
InsSciDE coordinator and lead investigator

Clearly presented, based on research conducted by the best specialists and shared with the academic community in scientific publications, the twenty-eight InsSciDE case studies collected in this volume are intended to stimulate reflection, to provoke exchanges and, to some extent, to pragmatically "think" scientific diplomacy practices in an innovative way. More than guides, these short cases are tools, aids to thought, on condition that those who need them appropriate them. While diplomacy is linked to a professional environment, this volume confirms the conviction that diplomacy is essentially an art. Science diplomacy is here considered as one facet of this art. It cannot therefore be confined to recipes and "good practices".

From history to case studies

Science diplomacy emerged as a "new" concept in the 2000s. Paradoxically, this term of "modernity" was defined by one of the oldest scientific institutions in the world, the Royal Academy.

InsSciDE researchers started work by proposing that the expression "science diplomacy", born in the 21st century, could nevertheless be applied to much older practices. All the studies presented in this volume demonstrate the validity of this hypothesis. But could these precedents be of any interest for present-day actors? To answer "yes" was our second assumption. If popular wisdom affirms that to know where one is going, one must first know where one comes from, our will was to go beyond this observation and to identify in a precise way the vectors that could place the discipline of history at the heart of the shaping of present-day diplomatic practices.

It was therefore a question of providing science diplomats, whatever their institutional affiliation and training, with materials but also with tools capable of nourishing their reflection, sharpening it, destabilizing it if necessary, in order to lead them to act in a more grounded and conscious manner.
In this way, this historical research, embedded in an interdisciplinary dynamic, was built in order to contribute to a better knowledge of present practices. To achieve this, the data generated by the research had to be presented in an appropriate manner and elaborated to contribute to a thoughtful evolution of practices in the present time.

Can history be "useful"?

The potential "usefulness" of history has classically given rise to numerous questions, most of which were asked when the discipline first took form and which still preoccupy historians today. Thucydides already affirmed in the 5th century BCE: "... if we see clearly the past events and those which, in the future, because of their human character, will present similarities or analogies, then the work will be considered useful and that will be enough". The Athenian general, both actor and analyst of his time, thus claimed the potential usefulness of his work as a historian. The way he formulated his purpose gave rise to multiple interpretations. Over the centuries, some saw in his work a collection of teachings applicable to all times, past, present or future, allowing statesmen to act more effectively. Others considered this usefulness as only occasional and denied that his text could be valid for any other times than the Peloponnesian war, or that it could include any practical orientation. Refusing this polarized approach, the classical scholar Jacqueline de Romilly has enlightened us on Thucydides' real purpose. While the Athenian historian did not claim to be able to predict the future, no more did he intend to limit his ambition to a simple chronicle. Thucydides, she explained: "did not renounce expressing a thought or being a 'philosopher': he wanted to force reality itself to take a philosophical scope and to express the most authentic philosophy". After centuries of evolution, the discipline of history now contributes to the elaboration of analytic models, sketches temporalities, and, by identifying the actors and their logics, aims at becoming an essential element for any reflection on the present time.

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The history of science and technology has mobilized diversified and powerful concepts. Social construction of science and technology, technoscience, networked actors, and technical systems have, among other ideas, radically renewed historical production and enabled a strong articulation with all the social sciences. The InsSciDE project takes its place in this manifold heritage. While rejecting the instrumentalization of history, it has listened to the questions expressed by society (and specifically by the European Commission) and proposed to contribute through historical research to the lucid and enlightened construction of a better future.

Science diplomats at the very heart of the framework

As the historian Marc Bloch wrote: "history is the science that has undoubtedly attached the most importance to the notion of man, because it has compensated its lack of a specific object by the idea that it would be the science 'of men, in time'". The women and men who, in many manners, have been involved in science diplomacy are therefore at the heart of this volume. The perception of ruptures or continuity, the feeling that time is accelerating or that on the contrary it weighs down and prevents any change, the emergence of sudden crises ... or in other words, their experience of the time that passes and their ability to control it or be subjected to it, should constitute a key element in the analysis of their thought and actions.

Thus, this volume offers a broad and diversified look at contextualized practices of "science diplomats". It consequently invokes the complexity and diversity of the institutions in which or with whom their missions have been carried out for more than two centuries. It also analyzes the interactions between these actors and the strategic, cultural and sociopolitical contexts in which they have been deployed. Even if another popular adage, "history never repeats itself", is nothing more than a falsely obvious statement, it is certain that the variability of situations, stakes and scales makes each case unique. The extreme variety of studies presented in this volume illustrates this perfectly.

Lessons? Rules? Good practices?

The idea that history can deliver lessons does not correspond to the spirit of our approach. This is why we invite our readers to apprehend these studies as living materials, to knead, dissect and then reconstruct them by confronting narratives of the past with their own experience. If the case studies can constitute a solid basis for teaching to a wide range of audiences, whether for initial or continuing education, their potential is even better expressed in the momentum of a collaborative construction that could allow science diplomats to confront collectively their experiences with those of their predecessors, and to enrich their analysis by crossing it with the highlights proposed by historians. As a vector of communication, these studies are also designed to encourage the various actors of science diplomacy to share their own experiences under the sometimes harsh light of history. The conferences and summer schools organized by InsSciDE have confirmed that contemporary actors find in their predecessors some of the enthusiasm, the concerns, the ways of interacting, and the challenges that they themselves face. Their own doubts and questions resonate within the actors of the past, and lead those of the present time to consider their own initiatives with a fresh eye.

Jacqueline de Romilly suggested that Thucydides' refusal to identify constants by himself was not due to a lack of ambition, but rather was an act of faith in the meaning and scope of his work. Perhaps we were unconsciously inspired by this posture and, like him, it is therefore to the intelligence of those who will read, criticize, use and appropriate these case studies that we entrust their destiny....

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Inside InsSciDE

Léonard Laborie

CNRS, InsSciDE scientific advisor

InsSciDE - the Horizon 2020 project "Inventing a shard Science Diplomacy fo Europe" - will have been a transformative intellectual and human experience for all project members. This is certainly true of all collaborative projects. But the framework designed here pushed further the interactions among the different partnering disciplines of the humanities and social sciences, and opened more windows of dialogue with practitioners and stakeholders than usual. This made InsSciDE a unique experience for most of us.

On top of that, the overall context undoubtedly made its own mark. How much has changed between the summer of 2016, when we were preparing our response to the European Commission's "Engaging together globally" call for proposals, and the summer of 2022! In retrospect, we should not be mistaken about the situation in 2016, which was neither clear nor very encouraging: we did not know where Brexit would lead, the Minsk agreements that sought to end conflict in the Donbas region of Ukraine were fragile, and the migration crisis had barely subsided. Since then, however, major parameters have changed, impacting both the content and the form of a project like InsSciDE, which brings together 14 institutions from 11 countries (plus UNESCO) to work on science diplomacy.

First change: the new European Commission, which took office in December 2019, with former German Defense Minister Ursula von der Leyen at its head, called for a more "geopolitical" commission, i.e., one that is more aware of its role, and active on a world stage marked by tensions and conflict. From this perspective, the European Union is no longer simply the "transnational problem solver" that has long formed its legitimacy in the eyes of Europeans, but rather is the assertive representative of their interests in the game of power. Conceived as a platform for strategic reflection on European science diplomacy, InsSciDE has had to take this change in direction into account and adjust to it.

The second, rapidly following change was the COVID-19 pandemic, emerging halfway through our project. From the beginning, our consortium and management board (composed of the leaders of each InsSciDE "work package" – research, engagement, or coordination) had been in the habit of holding our meetings via Zoom. But who would have imagined that as of March 2020 and for many months afterwards, we would spend the first hour or so of our regular exchanges reassuring each other about our respective state of health, comparing lockdowns, discussing the merits of contamination tracking applications, viral testing strategies, and then the progress of vaccination campaigns – first injection, boosters, etc.? While the media was full of news from our neighbors, and the period was marked by greater comparison than ever between countries, our collaboration made us live this European experience even more intensely, by sharing first-person narratives and feelings. Those who have championed the networking of researchers and the creation of the European Research Area have always had this dual objective: to produce better science, and at the same time to build Europe in and through the minds and interactions of the participants. Even if it was at a greater and more sustained distance, across computer screens, and in the presence of differing judgments and interpretations, we have all been led by this project to live and think Europe differently.

Throughout this time, the historical and contemporary cases researched by more than thirty InsSciDE authors took on not only the expected depth afforded by four years of work (plus a COVID-related extension!), but also new dimensions of meaning and relevancy. Health cases were taught at our pilot Warsaw Science Diplomacy School in June 2020. Our just-in-time adaptation to an online format enabled us not only to enroll students from across the globe, but also to open lectures more broadly to an interested international audience. All the science diplomacy case studies in this volume provide a rich view into the past, but also (with the help of study questions) trigger greater insight into the choices and tensions of the present.

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The final change in InsSciDE's context is the war in Ukraine. After the annexation of Crimea in 2014 and the outbreak of the separatist conflict in the Donbas, a first set of western sanctions had targeted Russia. But the European Commissioner for research and innovation at the time, Carlos Moedas, had been keen to exempt scientific cooperation. After he declared while on a visit to the United States in 2015 that "we are working to maintain this important bridge to Russia, preserving a precious link through the common language and ideals of science" [1], calls for projects were launched on the theme of science diplomacy in Europe, in this peaceful and cooperative perspective, which the funded projects have since pointed out as being partial or even romanticized. Since then, subsequent to the Russian aggression on Ukraine starting in February 2022, the Commission, in its geopolitical resolution, has decided to block payments to Russian organizations participating in ongoing H2020 projects and to prevent any Horizon Europe project from incorporating Russian partners [2].

In the same vein, albeit for distinct reasons, the United Kingdom is no longer associated with all Horizon Europe programs, and Switzerland, as of June 2022, has lost its status of associated country. Science and innovation cooperation are no longer the backchannel they used to be; instead, their interruption becomes part of sanctions and political bargains. These events, again, give texture to our historical case studies, especially those bearing on relations (through space diplomacy) with Soviet Russia.

These three changes were experienced by all European citizens and, more broadly, throughout the world. For InsSciDErs, both our way of working in transnational, interdisciplinary collaboration and our subject matter of science diplomacy were particularly affected, even transformed, shaping the studies and reflections we propose here for your reading.

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[2] Statement on Research by Commissioner Mariya Gabriel. STATEMENT/22/1528, European Commission, 3 March 2022.

Debating Across History, Theory and Strategy for European Science Diplomacy

Rasmus Gjedssø Bertelsen
UiT The Arctic University of Norway

InsSciDE - like Horizon 2020 research in general - is strategic research, because it is fundamental research for the purpose of answering a strategic problem of the funder. InsSciDE is strategic research into how Europe (the European Union, its institutions and member states) can benefit from science diplomacy to strengthen Europe's place in the world and improve the security and safety of the EU and its citizens.

The InsSciDE consortium of fifteen partner institutions has, from our first working encounters in July and September 2016, intensely debated the relationship between fundamental historical research into science diplomacy and the relationship with the H2020 call, European science diplomacy, and engagement of the stakeholders. The cross-cutting theme "Power With Science Diplomacy" has been a central reference in these ongoing debates.

This role was set in the earliest sketches of the structure of InsSciDE, in which a work package (WP) on power would connect the fundamental historical research WPs with those seeking to interface with the EU and stakeholders. The January 2018 photos below, from the Paris kickoff meeting of InsSciDE, allow a glimpse of the flipchart from September 2016 on which I took notes of our brainstorming that outlined InsSciDE. The WP "Power With" connects history and users.

The InsSciDE consortium with its leading historians of science and technology, science, technology, and society (STS) scholars, and also practicing archaeologists, discussed intensely what contribution history and historical research can make to strategy formulation. There are clear views that "lessons" from history are very limited, and potentially misleading. On the other side, the WP "Power With" pointed to the fallacy of "presentism" in social sciences with a too short historical memory. "Presentism", the incorrect belief that practices are recent and without historical precedents or links to the past, is blinding for both science diplomacy and strategy. European science diplomacy, if it is to exist and meet its potential and the hopes invested in it, needs to know about its past. InsSciDE itself exposes this fallacy; "science diplomacy" is a recently termed concept, but the cases in this volume show clearly the long historical legacy of using science for foreign policy purposes.

WP "Power With" is named in a contrast with "power over". The global challenges faced by the European Union require collective action, and states and non-state actors must empower each other to solve problems together. Political scientists address the concept of power naturally, while it is a problematic concept for many others. Power provides the fundamental questions and concepts of political science: what is power, who has power, why? Our work package saw power as a key concept for linking fundamental historical research on science diplomacy with the strategic research objectives for the EU. How does science diplomacy connect with different concepts of power, whether direct, agenda-setting, structural, etc.? How does science diplomacy affect changes in behavior, perceptions, norms, values, etc., and what conceptual and theoretical assumptions identify actors and explain outcomes? The ongoing consortium-wide discussions of such questions at conferences, in online seminars, and in formalized written exchanges, sharpened everybody's analytical, conceptual and strategic senses.

InsSciDE's political scientists played a defining academic role in the two Warsaw Science Diplomacy Schools (WSDS) in June 2020 and June 2021. These pilot programs were moved online because of COVID-19 restrictions, rather than taking place in Warsaw at the European Academy of Diplomacy (EAD). The consortium partners EAD and Institut Symlog de France superbly transitioned the WSDS to a global online format, enabling more than fifty early-career scientists and diplomats from six continents to work intensively on eight historical case studies and the formulation of science diplomacy strategy. Under my direction, WSDS innovated science diplomacy skills training by focusing on Risk, Safety, and Security for science diplomats, who may well operate in dangerous environments and conflict zones, and are scrutinized by intelligence and security services.

WP "Power With" proposed a European Science Diplomacy Strategy led by Dr Björn Fägersten of the Swedish Institute for International Affairs, with extensive European strategy writing experience. Dr Fägersten placed the InsSciDE research in the strategic context of the EU and identified lessons and pragmatic ways forward for European science diplomacy. "Leveraging Science Diplomacy in an Era of Geo-Economic Rivalry: Towards a European strategy", published in March 2022, was well-re-

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ceived by readers at the European External Action Service and can be accessed here: https://t.co/Bahzu2S4ZS

One of the most prominent examples of uniting fundamental social sciences research and policy-making with global impact was the British economist John Maynard Keynes, who explained the relationship between research, teaching and policy clearly, if in troubling terms: "The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else. Practical men who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back." [1]

InsSciDErs are key "academic scribblers" of science diplomacy, shaping the future "madmen" and "madwomen" in authority of European and global science diplomacy. Our project debate often had no definite answers, and the value of the discussion – like the value of the case studies in this volume – lies in the intellectual development of participants and readers, educators of future European and global science diplomats, or the practitioners themselves.

A clearer and more critical thinking on the relationship between the history of science diplomacy, social science theory, and strategic application of science diplomacy can hopefully contribute to a slightly safer and more humane world.

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Rasmus Gjedssø Bertelsen

Professor Rasmus Gjedssø Bertelsen, Barents chair in politics at the Arctic University of Norway, coordinates the Norwegian-Russian PhD course on society and advanced technology in the Arctic, and the Norway-EU Science Diplomacy Network. During 2022-2023, he is Nansen visiting professor of Arctic studies at University of Akureyri, Iceland. During 2020-21 he was visiting professor at Sirice, a joint programme between Sorbonne University/University Paris 1 Panthéon-Sorbonne and CNRS. Bertelsen holds a PhD. in international relations from the University of Cambridge. His postdoctoral research on the soft power of American and French universities in the Middle East was mentored by Joseph S. Nye, Jr., originator of the soft (and smart) power concept.

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The InsSciDE outline, coordinator P. Griset and executive director C. Mays; Paris, January 2018. Photos: R. G. Bertelsen

Inventing a Shared Science Diplomacy for Europe: Twenty-Eight Historical Cases, a Thousand Ideas

Claire Mays

Institut Symlog, InsSciDE executive director and development editor

This book of cases is like a bouquet. A bouquet of flowers, varied, colorful, perfumed: filling the senses, enlivening, seizing contemplation. A bouquet of fireworks, in the French sense: the grand finale.

The Horizon 2020 InsSciDE project created a community of historians and archaeologists, science-technology-society scholars, political scientists, and communication and training specialists. Together we have illuminated how science diplomacy has taken shape, and played out, and could develop in Europe. Our case studies range across 250 years and five thematic areas: heritage, health, security, environment, and space. InsSciDE researchers also looked at two cross-cutting themes: the issues of power revealed or leveraged with science diplomacy; and the fluid identities and practices of science diplomats themselves.

The twenty-eight InsSciDE case studies included in this volume examine individuals, communities, institutions, and also material objects, captured in a particular moment of interaction, or in a long duration. Our interdisciplinary collection opens a perspective on centuries and continents to show how science diplomacy springs from different sources. Science diplomacy is planned or unplanned, and sometimes perceptible only when looking back to track the processes and events set into motion by a dense, multilevel field of competing desires and demands. Science diplomacy sometimes grew from the curiosity and ambition of scientist-explorers, or from pragmatic acts of managing transborder crises. It emerged when actors at a diversity of levels each angled across time for a role and the power to advance scientific, national, or common-good objectives.

We show how science diplomacy can happen without an institutional mission, and how it is sometimes the context and the product of great struggles: to define futures (and policy) in the image of sociotechnical imaginaries; to rise in scientific and technological competence; to compete for primacy in innovation, and reap its economic, political or reputational fruits; to establish dominion, symbolic or territorial; to subvert and reconfigure geopolitical order; to defeat neocolonialism, and restore voice to a range of actors, human and non-human. We show how infrastructure such as data systems, or social media, or other diplomatic objects such as a research nuclear reactor or a space vehicle, are enlisted – with or without success – to channel and develop influence.

Never a unitary reading

This introduction is a very partial interpretation of the InsSciDE case studies by a non-historian, with apologies to their authors. My colleagues may not (or will not!) agree with my reading. Moreover, they would easily impart even more wisdom and insight in their replies to my thoughts. This manner of dialogic development characterizes the process of creating this volume: the request for common adherence to a harmonized template, and then my line-by-line challenges to my colleagues' drafts in the first months of 2022, resulted (we hope readers will agree) in a set of brilliantly clear, concise and precise statements. The latter are even more thoroughly drawn, and referenced, in classical peer-reviewed academic journal publications; these are indicated in the endnotes of each case.

The play of conflicting interpretations and clarification was our interdisciplinary experience throughout the time of InsSciDE. At one juncture there was a thought of making T-shirts, as the final project gift, to proclaim openly the common (if tacit) assertion "I am not defined by your theory". Instead, we deliver this volume of harmonized cases, in which each author accepted to bend scholarship and expression to a particular short format, in the goal of an incisive, and very broadly accessible, open fund of knowledge. The cases are there: go read them, alone, or preferably with a diversity of colleagues – professionals or early learners; argue, discuss and grow! In debate, or in multiple rereadings, these twenty-eight cases will inspire a thousand ideas.

InsSciDE colleagues, many firmly grounded in a university context, understand that undergraduate or postgraduate teaching is an inseparable part of research. In concert with our project partners who are specialists in dispensing continuing education (European Academy of Diplomacy), or international diplomats of science (some of our advisors, and consortium member UNESCO), we tried to share even more broadly with stakeholders, and learn from practitioners (including networks of science attachés). InsSciDE's joint experience of teaching and training, invoked by Daniella Palmberg's closing piece in this book, is collected in reports and open resources on science-diplomacy.eu.

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Taking a new, closer look at science diplomacy

Diogo et alia
Christensen

The InsSciDE cases teach us to observe the performance of (techno)science diplomacy in unexpected places, such as political cartoons or tweets ("non-canonical" sources to be analyzed). These lasting traces of communication urge us to reflect on the diversity of acts, verbal and non-verbal, done to influence both individual and collective framings, and the balance of power.

Kyrtsis and Rentetzi
Aberg
Ruffini

Similarly, the graphic illustrations we have added to all our cases urge our readers to project themselves into the context. Examine facial expressions in archival photos, and imagine the actors' feelings and motivations. Even stock or corporate photos, some devoid of human figures, invite you to grasp the stakes: the somber emptiness and complexity of a nuclear power plant control room invoke the potential for severe accident; the formidable size of ITER fusion reactor components communicates the multilevel challenge of its assembly – and invokes Big Science; the brilliant lights and elegant geometric elements of European diplomacy's Brussels headquarters invoke a particular institutional message and grandeur.

Realism: The variety of aspirations

InsSciDE was fortunate to count Pierre-Bruno Ruffini among our authors. Several cases in this volume cite, as a point of departure, his classical formulations of what science diplomacy can do for the state, and its hoped-for outcomes: advancement of national or larger-scale interests; reduction of tensions; improvement of cross-border relations; creation of a better international order. In his InsSciDE article "Conceptualizing science diplomacy in the practitioner-driven literature: a critical review" (2020), our colleague points to the well-known taxonomies of science diplomacy, then observes that "practices are broader than what the mainstream discourse covers", and proposes to investigate this "gap". Ruffini particularly questions why "the rationale of competition in science diplomacy is underestimated". He emphasizes that if a cultural bias toward scientific universalism and a top-down mission profile easily explain current practitioners' operational focus on cooperative actions, academia by contrast must address "all [the complexity of] practices located at the intersection of science and foreign policy". What is needed, Ruffini concludes, is "a conceptualization of science diplomacy that would account for the tensions between the idealism of science and the realism of diplomacy, and between international cooperation for the common good and competition driven by national interests."

Look no farther – and prepare to be destabilized. The InsSciDE case studies do not and cannot aspire to an integrated conceptualization, any more than they present a linear narrative of how science diplomacy discourses and missions have been determined and realized. By distinction, and doubtless by the force of impartial fact, InsSciDE authors instead offer a compelling picture of complexity traversed by tensions (which should comfort our advisor, sociologist Edgar Morin). This picture of science diplomacy is far from the "peace and love" image humorously derided in the early meetings of the Horizon 2020 sister projects InsSciDE and S4D4C. By its intense and variegated realism the InsSciDE image questions the very possibility, at this stage of scholarship, of settling the "constants" that Thucydides himself declined to draw when he founded the discipline of history twenty-five centuries ago (see Pascal Griset's introduction to this volume). Griset points out that numerous recent concepts (many applied in our cases) have renewed the work of history and ensured its articulation with other sciences. Nonetheless the irreducible thousand ideas found here demonstrate, perhaps, history's greatest asset offered to the understanding of science diplomacy.

The InsSciDE authors illuminate the messy tableau of the many things a diversity of actors wanted to do, during the period in which they turn out to have been doing science diplomacy. This book delivers a portrait of science diplomacy constructed on the ground, from the ground up. Only infrequently does a story we read here start with persons being sent on a defined mission with scientific or diplomatic goals. These are stories rather of science diplomacy forming and adapting in response to myriad factors; these are stories of aims and desires in stark competition. (In particular the intra-European rivalries depicted here pose useful questions regarding the effective arrangement of a European science diplomacy.) While Ruffini's work has rightly observed the willful application of science diplomacy in pursuit of national (or regional or global) interests, and government objectives, our book scatters images of a much greater variety of aspirations.

Overall, the cases communicate with force a sense of people wanting to get things done, responding (even with surprise) to opportunities or circumstances, testing moves and tinkering with solutions. In certain instances, the defining motivation is certainly the common good, as when technicians at the World Health Organization datafy relationships to enable a global movement toward greater vaccination coverage. Creating the infrastructure to support data exchanges, which binds a diversity of stakeholders into a productive network of public health knowledge and action, collaterally succeeds in imparting power and authority to the WHO. Political issues are transformed into technical issues, and inversely. Common-good objectives are front and center too in the evolution of blood safety measures negotiated by public health actors; the work of international standardization is both a noble and necessary pragmatism and a struggle over definitions, responding to and also attempting to evacuate, perhaps, both technical and ethical quandaries.

Pichelstorfer and Paul

Vlantoni

In some instances, a demand (for power, influence, or achievement) arises in some locality, and scientists (and/or political actors, or diplomats) have to rise to the occasion. All manage – with more, or less, success – to bend it to their own designs, taking the opportunity to advance other aims. We are treated, for instance, by this volume's interrelated space cases to a particularly lively vision of science bureaucrats and their interactions with political leaders. The Franco-Soviet *Premier Vol Habité* presented a complex, difficult, and disruptive task; human spaceflight was something that the French scientific community did not necessarily even agree on undertaking. A driving goal of national prestige (putting a French astronaut into space) here required scientific collaboration and administrative cooperation. And as this demand carried with it an opportunity to conceive and address another, community goal – for instance, understanding physiological effects of microgravity – scientist-administrators (on both the French and Soviet sides) fully undertook that cooperation. What is fascinating is how the cooperativeness "took off"; as in a fine doubles game of tennis, where the pleasure lies just as much in keeping the ball in play as it does in scoring points, *Premier Vol Habité* scientist-administrators and politicians alternately ran to the net as needed, engaging each time the public discourse most apt to keep the joint project aloft. Indeed, overcoming political challenges was time and again facilitated by insisting on the pure, scientific need to send life sciences payloads into space. By contrast, in the case of Soviet-US scientific rivalry-cum-collaboration on understanding the human effects of "space rays", military secrecy and party politics on their own side deprived Soviet scientists of priceless opportunities to obtain data. Scientists close to making a leap in theoretical understanding of the cosmos were left in the dust of terrestrial concerns. Here competing demands could not coalesce into mutual achievement carried out by political and scientific actors. Was that because, despite the heroic propaganda slogans and posters depicting the cosmonauts, a deep understanding of the multidimensional value of scientific/political cooperation was not fully shared? Or was it because contradictory role demands were resolved (as so often, and so simply) by brute power?

Griset

Roche-Nye

Dubrovina

Instrumental relations, or co-shaping?

The stories in this volume spark questions of instrumentalization. Do the agents of state power uniformly, and primarily, hijack science to attain goals of power or appeasement? Is that a "politicization" of science to be avoided, as a European External Action Service science counselor warns? Or are scientists' individual or collective goals and desires just as strong, just as present, and just as generative of masterful strategy (and sometimes of trade-off sacrifice) as the most pressing political ambitions? The InsSciDE cases, especially those tracing the actions of individual science diplomats, show how state diplomacy may be pressed into the service of scientific realization.

Ruffini

A French scientist-explorer of the late 19th century, avid for knowledge conquest, calls on overseas national representation (military or diplomatic) for protection or support in foreign lands, and obtains it by appealing to the notion of national pride (competing nations are filling their museums faster with harvested treasures of antiquity!). The concept of "scientific attaché" arises in the mind of that explorer in 1878: why not simply appropriate, for greater efficacy and agility, the very diplomatic identity? His "wish" is immediately understood and ratified by experienced colleagues, who suggest manners of introducing it into the mind of power. The French will not succeed at that time in establishing the attaché role (while more than a century later their network of science attachés will be dense); the state prefers to establish overseas institutes like French schools. By contrast, German scholars will win the designation of "extradiplomatic scientific attaché", but the associated conditions remind us that when power grants status, the grantee owes

Laborie

Paillette

duty. Elsewhere, twenty years later, French medical scientists are accustomed to creating international scientific forums to dispute theoretical models of contagion and practical recommendations for epidemic management; they issue reports that will advance both their disciplines and international health governance. The scientists of the Institut Pasteur are naturally called to Porto when plague breaches the European continent; they rely in that city on the French consul for both lodging and laboratory space, and meet not only the service goal of containing the epidemic, but also the combined political and internal goal of increasing the global visibility and prestige of the Institute's anti-plague serum. Moreover, in stark changes of level, these moves will reflect – and contribute to the creation of – a European identity, and lay the foundations of a global health diplomacy.

Gamito-Marques

Emerging from these stories is a vision of alternating, mutual, or reciprocal instrumentalization, or more compellingly what Léonard Laborie by the end of our project called "co-shaping". The science and networks of 19th-century zoologist Jose Vicente Barbosa du Bocage were vital resources for Portugal in the (prototypically competitive) Scramble for Africa. Were the geographical societies created in his time principally to promote economic and imperial ambitions, or to lobby government for support to scientific missions? Laborie wrote of Bocage (in review comments): "moving from science to diplomacy, because of his knowledge, and calling for further knowledge production, in his position of diplomat-in-chief, Bocage embodies and reinforces the continuum that in certain areas of knowledge and world politics exists between science and diplomacy".

Gouarné

Indeed, that notion of co-shaping gives the non-historian insight into "history": the science diplomacy exposed in these cases is rarely decided, written, understood, or regulated in advance, nor even in the precise time of its unfolding. Instead, history – that is, what we witness through these case studies – is constructed across time by the various forces co-shaping reality, and then by our ability to look back, note patterns, and interpret outcomes.

Simões and Diogo

For these reasons, doubtless, some authors emphasize their recourse to the *longue-durée* perspective. Indeed, most InsSciDE authors have preferred to consider not a single salient moment in time, but a series of events and of relational configurations that form over some period – one that emerges, or takes on coherency, once we look back. This approach allows the historians to take into account as well their subjects' evolution in position over time, and in some cases their reflexivity, quoting their archives, diaries, and also later interviews in which the actors themselves express their perspective on events in real time, or reflect on the past.

Le Roux
Dubrovina

Arrangements and assemblages

Roche Nye
Gouarné

Of note, several cases highlight the durability of multiactor cooperation and mutual support across time and even across regime changes. These cases attest less to the permanency of institutional arrangements, and more to the adaptability of actors, and the adequacy of tacit or reified principles, which together enable science diplomatic arrangements to endure. Here too, a lively picture of both human and institutional relations is delivered in accounts of satisficing arrangements based on such principles as "reciprocity and compromise". These concepts - simultaneously pragmatic and idealistic - are present in the very organizational structure of the fusion project ITER, and describe just as aptly the ongoing history of transnational collaborations on archaeological digs.

Aberg
Butterlin

Griset

Many of the cases invite us to consider the conditions under which arrangements emerge (or fail to emerge), detailing their development. These may be arrangements that arise in a pragmatic way, or in a convergence of interests, and are then solidified – but still may need conscious examination to be sustained. This is the case when academy of science international activities benefit from local consular and then ministerial support, but where sponsors should reflect on the academies' need for stable funding and also for complete independence in decision making.

Le Roux

The arrangements may be unplanned or even perhaps cynical, but the actors each recover (more or less) their chestnuts from the fire. Examples include French phytochemists inventing acceptable ways to obtain funding and support for transnational research; when diplomats were pressed into service for scientists' field security, their own expertise and practices in turn were enriched.

Kyrtsis
Paillette

Several authors emphasize that such arrangements – personalized or institutional – depend heavily on the establishment of trust. Although not thoroughly operationalized in these essays, trust appears to be interpreted as a common

acceptance (and experience) of normalized procedures and principles on which reliably predictable transactions may be based. Perhaps a species of normalization would be needed to enable diplomats to call on science in crisis. When the Portuguese ambassador to Japan finds that his national scientific resources are less useful than are his habitual (and non-European) diplomatic networks to face the Fukushima nuclear catastrophe, both science diplomacy and the presence of Europe as diplomatic actor are called into question.

Urze, Diogo and Simões

Co-shaping is present not only in institutional arrangements. It also affects the very materiality of technoscience achievements caught in multilateral dynamics. Objects such as the Hermes spaceplane are transformed through games of influence, when twin tools of attraction and cooperation allow French delegates to the European Space Agency to obtain the partnerships (national, international and European) required to materialize a particular interest. (Of note, the French triumphed in shaping the blueprint for years of European work – but the Hermes vessel never actually made it off the paper!) The cases easily convey French philosopher Gilles Deleuze's notion (recalled to us by our advisor John Krige) of "assemblage": whether of stakeholders, research communities, and rationalities; or of ambitions, real-time responses to constraints, and "diplomatic objects".

de Floris

Adamson

The InsSciDE case studies also do a fine job of revealing how framings, procedures, and the very data and principles of science can be the outcome of ongoing moves by different actors. This is the case when third party liability insurers take an active, if backstage, role in shaping and informing negotiations around nuclear safety standards. Our cases pose the question of where front stage and backstage diplomacy meet, and of the interplay of formal, informal, and even "imagined" diplomacy. Several authors demonstrate the weight of sociotechnical imaginaries – shared mental images of technological potentials, imbued with values – in setting diplomatic and policy agendas (or triggering counter-agendas). The United Nations Convention on the Law of the Sea was beaten out on the moving waters of several ocean imaginaries that divided the global north (ocean as a limitless resource) and south (ocean as an environment to be protected), revealing and emphasizing not only different values and concerns, but also these actors' differential ocean science capability. The narrative of "nuclear winter" captured the public imagination, but despite a strong run did not succeed in winning the race of science research policy setting whose outcome could determine different futures for the international arms race. Not only sociotechnical imaginaries, but also more intimate ones – such as social representations of bodily, political and food/water security – are active, we learn, in the construction and treatment of geopolitical accords. At the 2015 Valletta Summit on Migration, the unexamined privilege accorded to the empowered actors' imaginary of security leads to the denial both of neighbors' reality and of scientific input. An inability to empathize with neighbors is clearly evident in the account too of German archaeologists' handling of a 1963 workers' strike on a dig in post-colonial Syria.

Kyrtsis and Rentetzi

Simoes and Diogo

Robinson

Turchetti

Mikros

Helms and Pruß

The scientific impulse

In their boiling realism of complexity traversed by tensions, what do InsSciDE cases tell us of scientists' goals and desires? The "universal values" and "common language" of science delineate well the ability of scientists to form projects across borders and participate in multilateral schemes. Our historical science diplomacy accounts transmit, moreover, the exaltation of scientists. The constant presence of scientists' will to understand, to know, and to create (as well as to be recognized and empowered) makes the stories read like a good novel. We can share triumph and frustration with scientists here, enjoy discovery with them, and reflect on the scientific impulse and the meaning of scientific greatness.

The Citadel project applies (under conditions of great danger) disciplinary art, diplomatic skill, and technoscience to make contact with the Assyrian capital Dur-Sharrukin (built between 715 and 705 BCE under the rule of King Sargon II). This account offers a particularly inspiring image of science as a brilliant intellectual and highly social endeavor, where science and sociability reach across cultures, borders, polarized violent conflicts, and far spans of time. The archaeologists, present and past, of our volume are called by ministries and museums to integrate their expertise in the governance of transborder specialty science. Similarly, the high scientist-administrators of the agencies involved in realizing human space flight were dually talented individuals, whose ability in both science and diplomacy enabled the achievement of complex projects. That such persons are called upon to serve reflects a certain intelligence of technocracy, and offers one explanation of how nation-states can perform innovation.

Butterlin

Roche-Nye and the space cases

Simões and Diogo

Laborie

Gamito-Marques

Helms and Pruß

Le Roux

The Enlightenment naturalist José Francisco Abbé Correia da Serra's diverse investigations of the American geography, flora and fauna, and his vision of a geopolitical American Hemisphere, combined with his genial "tea-cup" diplomacy, impress us. A "utilitarian view of science" as delivering access to resources may, as the case authors say, indeed be "appropriate to a country under construction". Not all the field scientists of the InsSciDE cases, however, are perfectly sympathetic figures. Tales of willful extractivism and exploitation make us uncomfortable. Reading many stories not only of the aim to influence world order but also of assertive scientific ambition, we may ask: is there a fundamental difference between a desire for political hegemony and the desire to master, before all others, both knowledge and perhaps nature?

Wormbs

Foyer and Dumoulin Kervran

Yet the InsSciDE collection allows us also to envision other relationships with science and nature. We are introduced to – or reminded of – modes of knowledge production and use that question western paradigms. Indigenous or "traditional" knowledge (thus accessible, one may hope, to us all) is linked less with exploitation than with both survival and quality of life. Nature (the environment and non-human actors) in traditional contexts is approached in a respectful conservancy relationship. Such representations combined with role interpretations yield narratives that point to an "alternative" science diplomacy. Here our societies' relationship with our own climate, admitting of less and less negotiation, may yet be appeased. New or traditional modes of cooperation may be found to address, indeed, our global challenges for the common good.

An alternative view on science diplomacy

The InsSciDE collection of historical case studies invites us to entertain, if not an alternative diplomacy that can be immediately set in motion, certainly an alternative view on science diplomacy. Beyond the canon of "diplomacy for science", and "science for or in diplomacy", beyond the practitioners' insistence on the operative uses of diplomacy and science, InsSciDE research communicates in this volume a new contribution to the field: a living, moving, endlessly complex and compelling image of historical reality in all its many dimensions and contradictions. InsSciDE authors together offer us a mirror in which we may glimpse not only a recognizable image of human desire, but also a deep perspective on how cooperation and competition form, against the odds and beyond prediction, our technoscientific achievement and our international relations.

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Claire Mays

Claire Mays is a social psychologist and a founding director of Institut Symlog de France. After 25 years of citizen-centered action research in technological risk governance, she was happy to pivot to the role of executive director of Horizon 2020 InsSciDE. There her predilection for inciting collective achievement, and for co-developing significant works of written communication, was well employed.

Science Diplomats

Science Diplomats:
Fluid Identities and Emergent Practices

Maria Paula Diogo (NOVA) and case study authors

InsSciDE's *Science Diplomats: Fluid Identities and Emergent Practices* focuses on individuals and institutions engaged in science diplomacy as critical actors. We explore the multiple personae played by science diplomats over four centuries (18th to 21st centuries), looking for the roots of the concept of science diplomacy in both past and enduring informal and formal practices bridging scientific expertise and diplomatic action, while simultaneously creating networks connecting actors and institutions. By making visible these practices – the power they conveyed, the tensions they generated, the regulations they required – we add to the contemporary concept of science diplomacy an extra layer that should be part of the basic kit for European diplomats. Conversely, we use the concept of science diplomacy as a tool for historical research that lets us revisit traditional narratives from an innovative perspective.

The dynamic dialogue between historical case studies and contemporary practices connects the past to the present and future, encouraging a multilayered and multidimensional analysis of contemporary practices to identify and rank future common strategies for European Science Diplomacy.

The case studies presented by our group range from a very informal "tea-cup diplomacy" (Simões and Diogo) to formal diplomatic responses, and from individual to institutional actors (Urze, Diogo and Simões). We consider the role played by national Academies of Sciences (Griset), by science attachés at national embassies (Laborie), and by science counselors of the European Union posted at EU delegations abroad (Ruffini). Throughout time, scientists and engineers, often using the privileged channels made available by academies and professional associations, aimed at assuring the role of the sciences in building national identity and empowering states; they contributed as well to the struggle for hegemony within and beyond Europe (Gamito-Marques). Their scientific aims cannot be disentangled from implicit and explicit political ambitions in a complex network design in which the various nodes act simultaneously as hubs of national and international power (Diogo, Simões, and Urze).

As such, we explore the circulation of academicians and experts and the ways they helped to build academic scientific networks across Europe, paying particular attention to their impact on the worldwide science diplomacy landscape, in processes of colonization, and in the unfolding of 20th century wars (First and Second World Wars and the Cold War). We "ask" our actors whether and to what extent formal and informal networks of science/scientists became an instrument or a resource for national diplomacies; whether they used diplomacy and diplomatic networks to achieve their own agendas side by side with that of the nation states they represented; and whether they themselves developed an alternative, "track-two" diplomacy of their own.

The *longue-durée* perspective permits a more encompassing understanding of the concept of science diplomacy by bringing to the forefront its use as an instrument of both collaboration and confrontation among states, as well as its role in the extensive grey area in between. By discussing both historical and contemporary case studies, we explore the articulation between the observed science diplomacies of European states and the possible common science diplomacy of the European Union.

Based on our case studies – that reflect the history of Europe itself – we believe that the invention of a shared science diplomacy for the European Union cannot be grounded on the standardization/bureaucratization of procedures. Instead, it must rely on flexibility, agility, and an ability to generate consensus from a plurality of viewpoints. It should work as an assemblage, that is a set of different perspectives brought together in a common fabric, but still able to preserve the identity of each thread.

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

Science Diplomacy in the Republic of Letters:

The Naturalist Abbé Correia da Serra

An InsSciDE Case Study

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"The Abbé's diplomatic ability consists principally in affecting to be anything but a diplomat. He introduces himself as a familiar acquaintance, to talk literature and philosophy, as a domestic intimate, to gossip over a cup of tea."
- *Memoirs* of John Quincy Adams, in Davis 1993, 60.

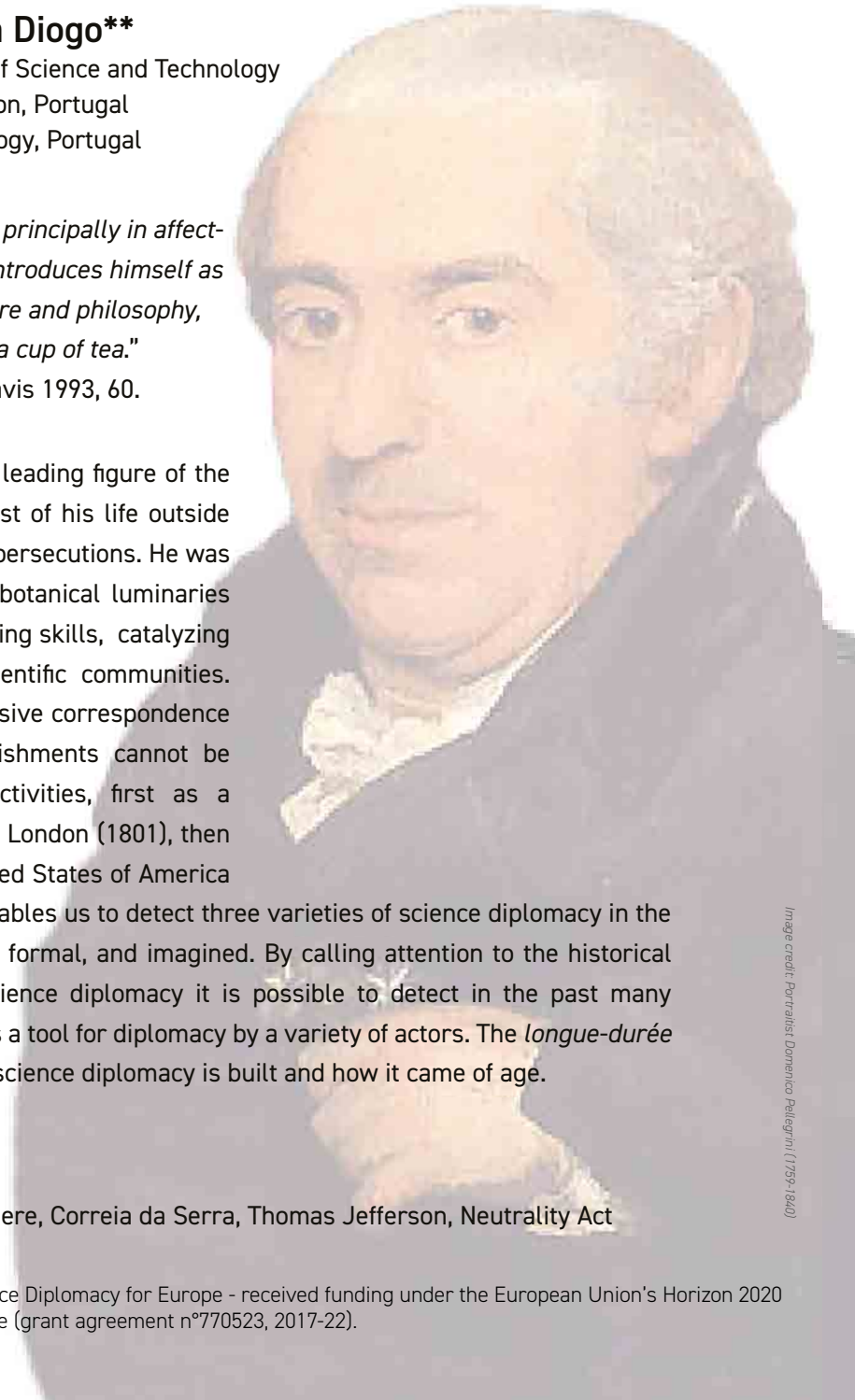


Image credit: Portraitist Domenico Pellegrini (1759-1840)

Abbé Correia da Serra (1751–1823), a leading figure of the Portuguese Enlightenment, spent most of his life outside Portugal due to political and religious persecutions. He was a naturalist recognized by European botanical luminaries for his innovative ideas and his mediating skills, catalyzing communication between different scientific communities. Correia da Serra's life story and extensive correspondence suggest that his scientific accomplishments cannot be disentangled from his diplomatic activities, first as a member of the Portuguese Legation in London (1801), then as Ambassador of Portugal to the United States of America (1816-1820). Their conjoint analysis enables us to detect three varieties of science diplomacy in the practice of Correia da Serra: informal, formal, and imagined. By calling attention to the historical dimension of what today is called science diplomacy it is possible to detect in the past many instances in which science was used as a tool for diplomacy by a variety of actors. The *longue-durée* perspective helps us understand how science diplomacy is built and how it came of age.

Keywords:
Republic of Letters, American Hemisphere, Correia da Serra, Thomas Jefferson, Neutrality Act

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

Science Diplomacy in the Republic of Letters:
The Naturalist Abbé Correia da Serra

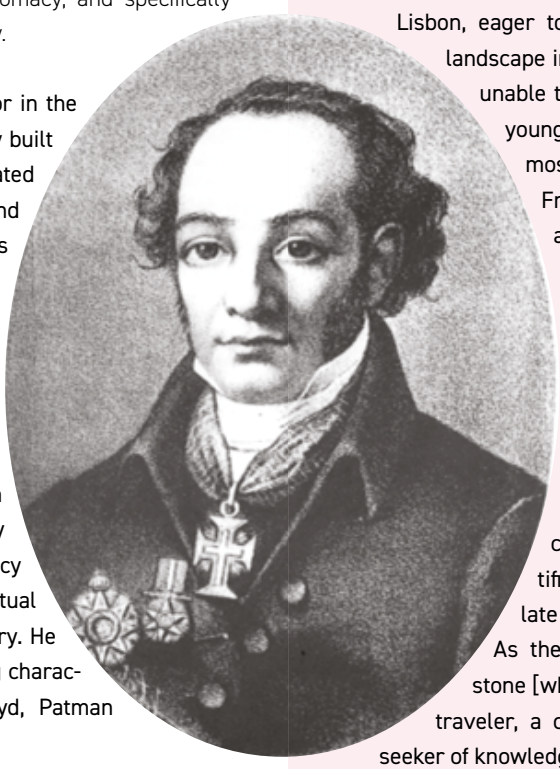
In his turbulent life, Abbé Correia da Serra played diplomatic roles twice. The first, in England, as advisor to the diplomatic legation and business agent of Portugal in London, during 1801, just before escaping to Paris; the second, between 1816 and 1820, as the first ambassador of Portugal to the United States of America.

Two diplomatic roles: UK and USA

Although there are no details of the scientific activities mediated by José Francisco Correia da Serra while serving at the Portuguese legation in London, one knows that throughout his stay in London (1795-1802) he informally performed functions close to scientific and technical espionage, especially at the beginning of his British stay. At the request of Rodrigo de Sousa Coutinho, a Portuguese diplomat and naturalist, then secretary of state of naval affairs, Correia da Serra sent to Portugal dry and live vegetable specimens, books, diverse material, including catalogs and instruments, maps of the defense plan of the ports of the British Isles, and hydrographical charts. His letters discussed medical and public health issues, and referred to the first vaccines.

The activities of Correia da Serra in England fall under what is usually called informal science diplomacy, and specifically science and technology for diplomacy.

The abbot's credibility as ambassador in the United States of America was largely built upon his scientific capital, accumulated over the preceding decade in England and France. He was acknowledged as a leading European naturalist, expert in botany and geology, versed in subjects ranging from theology to political economy, recognized as a brilliant communicator, educator, and promoter of junior scientists. Together with his membership in freemasonry, the transfer of authority and prestige from science to diplomacy gave him quick access to the intellectual and political circles in the new country. He performed multiple functions sharing characteristics of science diplomacy (Lloyd, Patman 2015; Ruffini 2017).



Portrait of young Correia da Serra. Courtesy of FLAD

Protagonists: The abbot and his networks

José Francisco Correia da Serra, known as Abbé Correia da Serra (1751–1823), was a leading figure of the Portuguese Enlightenment. His rich life and career are hard to define. He was a clergyman who seldom exercised religious functions; he was a freemason; he was a naturalist, an impressive contributor to the field of botany and an interlocutor of the network of naturalists of the Republic of Letters which included luminaries such as Joseph Banks, James Edward Smith, Alexander von Humboldt, Alphonse de Candolle, Georges Cuvier, to name a few.

The abbot however was furthermore recognized for his mediating skills as a catalyst in the communication between different scientific communities, a facilitator who encouraged and supported a transnational network of scientists; additionally he was a founding member of the Academy of Sciences of Lisbon, eager to change for the best the scientific landscape in his home country, although he was unable to build his own circle of students or young scientists in Portugal, as he spent most of his life in Italy, Great Britain, France and the USA, due to political and religious persecution.

Appropriating a concept used by historians, we define Correia da Serra as an *estrangeirado*, in the sense of a European-oriented intellectual, an active member of an influential and fluid network of diverse people united by the will to change the Portuguese cultural, scientific, and technological landscape of the late 18th century and early 19th century. As the song says, he was like "a rolling stone [which] gathers no moss", a compulsive traveler, a citizen of the world, a globetrotting seeker of knowledge, prestige, and recognition (Simões, Diogo, Carneiro 2012; Raposo et al. 2014).

Personal, scientific, and political networks in the USA

Correia da Serra arrived in the United States in 1812, at the age of sixty. He was attracted by the liberal ideals of the young republic, consonant with his own political inclinations. He brought with him letters of recommendation from influential writers and diplomats, as well as from prestigious scientists.

While he waited to receive from the king of Portugal the news of a diplomatic post (which incidentally took four years to arrive), he enrolled in the cultural and scientific life of Philadelphia. He became a member of the American Philosophical Society, presided by Caspar Wistar, and of the informal Wistar Party, a restricted circle of intellectuals who met weekly; he also became a member of the Academy of Natural Sciences of Philadelphia. By 1815, he was delivering lectures and teaching courses at both societies and was probably the first to introduce the de Jussieu system of plant taxonomy in the United States (Agan 1926, 20). He advised on the reorganization of the University of Pennsylvania, suggesting the creation of a faculty of physical sciences and rural economy, in clear consonance with the utilitarian view of science appropriate to a country under construction.

He became also acquainted with local naturalists, intellectuals and editors of literary magazines and journals, including the American Review of History and Politics, in which the abbot was to publish historical reflections on the past, present, and future state of Europe. In 1813, he visited President Madison in Washington and met in Monticello, Virginia for the first time with Thomas Jefferson. This meeting marked the beginning of the long-lasting friendship of two kindred spirits despite all that might seem to separate them. Freemasonry and scientific ideals united a deist and an unconventional catholic clergyman (Maxwell 2003, Carneiro, Simões, Diogo 2012). Correia da Serra became such a regular visitor to Monticello, Jefferson's estate, that one of the guest chambers is still called the "Abbé's oom."

Jefferson confided to Wistar that Correia da Serra was "the best digest of science in books, men and things that I have ever met with; and with these the most amiable and engaging character". They regularly discussed scientific matters of common interest. No wonder, then, that Correia da Serra was involved in the educational program of Jefferson, materialized notably in the creation of the University of Virginia. He not only advised on the definition of curricula but also on the criteria for hiring teachers, which presupposed, in his view, the admission of foreign teachers to circumvent New England parochialism.

Despite advanced age and chronic health problems, Correia da Serra traveled extensively throughout the United States, especially before becoming ambassador. He was soon one of the greatest connoisseurs of the country's natural landscapes, diverse climates, flora, and geological characteristics, as well as populations and their habits. He visited the states of New England, Pennsylvania, Virginia, Ohio, Kentucky, Tennessee, Georgia, North and South Carolina and the Cherokee lands. Traveling frequently with friends, he took advantage of these trips to make new acquaintances. These were also occasions to train a generation of naturalists and contribute to the professionalization of an emerging scientific community.



President Jefferson (by Rembrandt Peale); Monticello estate (by Matt Kozlowski) and the Abbé's Room. Wikipedia, public domain; © CC BY 2.5; Courtesy of FLAD

Sciences and stakes: The Abbé's double role in advising the young United States and his own government

Correia da Serra promoted a utilitarian view of science, anchored in the inventory and study of natural resources, with a view to their economic use and the consolidation of the political independence of the United States. In this context, he wrote to President Madison about the exploitation of mineral resources, such as iron, copper, lead, salt, and silver, and insisted that revenue should be taken from public lands. He also began an exchange with Jefferson, and others, on the characteristics and cultivation of various plant species of economic interest, such as chestnut trees, coffee and sugar cane, or the use of pozzolana as cement in the construction of cisterns and aqueducts. The detailed knowledge of the extensive North American territory was recorded in a single article published in 1818 in the *Transactions of the American Philosophical Society*, which describes the formation and nature of the soil of Kentucky and explains its exceptional fertility as an outcome of its specific geological character.

In all these instances, Correia da Serra informally exercised a kind of "science for diplomacy", in the sense of using scientific expertise to advise past and present philosopher presidents on political economy, thereby further amassing scientific credit for his future diplomatic functions.

In his capacity as ambassador after 1816, Correia da Serra carried out research in Philadelphia and in the main ports of the American Northeast, reporting economic and political findings relevant for commercial trade between Portugal and the United States. These pertinent "diplomacy for science" reports did not, however, get the attention they deserved from the Portuguese government as potential tools of science policy.

Portuguese ambassador in Washington and the Neutrality Act

In 1816, Correia da Serra was finally appointed Ambassador to Washington, a gesture that the abbot summarized with characteristic wit: "It is somewhat like the persimmon fruit, comes late, and has been ripened by hard frosts". Long recognized by the American elite as a liberal and exceptional naturalist who shared the ideals of the philosopher presidents, Correia da Serra confided to President Madison that as a new ambassador he found himself in a very unusual position: his strong attachment to the young nation made him feel like a "family minister". John Quincy Adams, at the time Secretary of State and later president, who had a great appreciation for Correia da Serra, noted in 1819 that his diplomatic ability was anchored in intellectual and friendly debates over a cup of tea, particu-larly attractive to the philosopher presidents, that is Correia da Serra was an expert in the practice of "tea-cup diplomacy". Jefferson, of course, rejoiced at the nomination, for he wished Correia da Serra to settle in the United States, and anticipated that the post would leave him plenty of time for botanical investigations. But this was not to be.

The diplomatic situation of the American continent proved to be very difficult for Portuguese interests, especially due to the support of some North Americans, installed in South America, to anti-colonial, and by extension anti-Portuguese movements. There were constant acts of piracy against the Portuguese fleet by ships from the Spanish colonies in South America, often perpetrated by Americans with the complacency of local authorities. Brazil, then still a Portuguese colony (though not for long), also was politically unstable, a situation intensified by the declaration of independence by Pernambuco, followed by the quest for international, mostly American, recognition. Correia da Serra was forced to file various protests to the Secretary of state James Monroe, soon to become president. The ambassador's action led to the approval by Congress of the Neutrality Law, in 1817. This law became a central piece of the Monroe Doctrine, which advocated the non-interventionism and isolationism of the United States in matters of international politics.

In this crisis of American international policy relations, Correia da Serra exercised science diplomacy *avant la lettre*. His success in influencing the host country's posture resulted mostly from the capital he had accumulated as a masonic polymath.

Although Monroe, in his capacity as president of the United States, often reminded his Secretary of state John Quincy Adams (also a future president) of the importance of Correia da Serra as a diplomat and a cultured man, the fact is that he did not always do justice to the protests by the Portuguese diplomat. As stated before, the abbot's diplomatic ability, built largely on impressive scientific credentials, consisted principally in affecting to be anything but a diplomat, impersonating the role of a friend who dropped by for just a cup of tea. In Adams' words, Monroe saw through this, "but having no relish for literature and philosophy, and no time to listen and laugh at jokes, he always kept the Abbé (...) at arm's length".

In the end, the Portuguese ambassador felt increasingly powerless and disillusioned with American politics and politicians. His hopes nurtured in an American nation built on the egalitarian ideals of the Enlightenment gave way to weariness and skepticism, and Correia da Serra became progressively more conservative. By 1820 he planned to move to Brazil and hoped to play a decisive role in the definition of "Public Instruction", in the context of the project of an "American Hemisphere", autonomous vis-à-vis Europe, which his masonic friend Jefferson discussed with him.

From the end of the eighteenth century, part of the Portuguese intelligentsia as well as some politicians advocated the idea of a "Brazilian Portugal" as an extra way of neutralizing, through integration, local Brazilian nationalisms. After the transfer in 1807-08 of the capital of Portugal from Lisbon to Rio de Janeiro, following the Napoleonic invasions, this project gained a new impetus and new advocates. Correia da Serra was among them.

Named by his American friends "our Socrates" or the "Franklin of Portugal", Correia da Serra shared with Jefferson similar views on politics and history, based on the structural and integrative function of the sciences. His diplomatic practice, and historical reflections in the American Review of History and Politics on the past and future of Europe, made him particularly attuned to the Jeffersonian geopolitical project.
Therefore, Correia da Serra was prepared to explore what we may call science diplomacy imaginaries (Jasanoff, Kim 2015), when designing, together with Jefferson, a project to build a new international order, splitting the American continent between the United States in the northern hemisphere and the Brazilian Portugal in the southern hemisphere. This utopian vision, grounded in their shared views on politics and history, was guided by the structural and integrative function of science.

In Jefferson's words to Correia da Serra, "nothing is so important as that America shall separate herself from the systems of Europe and establish one of her own. Our circumstances, our pursuits, our interests are distinct. The principles of our policy should be also. All entanglements with that quarter of the globe should be avoided if we mean that peace and justice shall be the polar stars of the American societies."

As a science diplomacy imaginary, the American Hemisphere project embodied the vision of a new geopolitical continental block, fighting for hegemony vis-à-vis the old European continent.

Conclusions:

The Abbé's three science diplomacies and their impact on the geopolitical order

Through three varieties of science diplomacy – informal, formal, and imagined – Correia da Serra helped to mold a new geopolitical order, both real and imaginary. Vis-à-vis the Portuguese government as ambassador in Washington he exercised functions which may be dubbed **formal diplomacy for science**. Vis-à-vis the American philosopher presidents and the American government his scientific credit helped build a strong diplomatic role, that is, **the success of his formal science diplomacy was grounded in informal science for diplomacy.**

Correia da Serra developed his influence through field trips, education of young scientists, advice on university organization and discussions on the scientific agenda of the new country; he weighed on new geopolitical constructions through his "tea-cup diplomacy." His proximity to the high spheres of American government was such that Correia da Serra acted as a double agent, not in the usual sense of a Portuguese diplomat secretly serving the United States of America but, on the contrary, as someone considered a citizen of the world by his peers, who furthermore dreamt of becoming a founding father of the new political American Hemisphere. In this last instance, Correia da Serra, together with Jefferson, were scientist diplomats enrolled in the practice of generating geopolitical and scientific imaginaries.

Correia da Serra's diplomatic activities show why the history of science diplomacy is relevant. By calling attention to the historical dimension of science diplomacy, a quite novel term associated with a recent professional practice, it is possible to detect in the past many diverse instances in which science was used as a tool for diplomacy by a variety of state and non-state actors, and as part of formal or informal networks. By calling attention to the plasticity of the concept of science diplomacy, the *longue-durée* perspective helps us understand how science diplomacy is built and how it came of age.

Study Questions

• Are there instances today of scientist-diplomats fostering technoscientific activities that could determine a new world order?

• Is their primary objective technoscientific, geopolitical, or something else?

• Are science and technology important for diplomacy?

• Is diplomacy important for the development of science and technology?

• How should we deal with hybrid spaces and practices involving scientists, engineers, and diplomats?

• Have science, technology, and diplomacy equivalent power in negotiations?

• Why is science diplomacy particularly suitable to illustrate the concept of soft power?

Endnotes

• Throughout the case study, quotes (including the epigraph) are taken from Davis, R B (1993) The Abbé Corrêa da Serra in America, 1812-1820. The contributions of the diplomat and natural philosopher to the foundation of our national life. Providence, Rhode Island: Gávea-Brown. Citations pp: 60, 37, 200, 52, 202, 50, 60, 51, 60, 106, 324, 298-299.

• Cover image : The Abbé Correia da Serra, by Domenico Pellegrini (1759-1840). Source: commons.wikimedia.org/wiki/File:Abade_correia_da_serra.jpg. Public domain.

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Science as Power in the Scramble for Africa:

Scientific Networks and the Diplomatic Colonization of Africa in the Late Nineteenth Century

An InsSciDE Case Study

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Science diplomacy is usually discussed as a post-Second World War phenomenon. However, the links between science and diplomacy can be traced to earlier periods. This case analyzes one example related to the European colonization of Africa in the late nineteenth century, known as the "Scramble for Africa". Scientists usually perform only advisory roles in politics. In this case, a scientist attained important political responsibilities, ultimately becoming Minister of Foreign Affairs and conducting formal diplomatic negotiations. This scientist was José Vicente Barbosa du Bocage (1823–1907), a nineteenth-century Portuguese zoologist.

Bocage's knowledge of African geography acquired via his scientific studies and at the head of the Lisbon Geographical Society, as well as the scientific, colonial, and political networks he joined or formed, allowed for his political rise. Once in a position of power, he placed knowledgeable Portuguese personalities at the center of colonial discussions with powerful rival countries, such as France and Germany, ultimately seizing some colonial victories for Portugal in Africa. This case shows that while science diplomacy can be a tool for cooperation, it can also be used to gain competitive advantage over rivals.

Image credit: Biblioteca Nacional de Portugal

Keywords:

African geography, geographical societies, colonialism, scientific networks, Berlin Conference of 1884

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Science as Power in the Scramble for Africa:

Scientific Networks and the Diplomatic Colonization of Africa in the Late Nineteenth Century

Science diplomacy is often presented as a means to achieve cooperation among stakeholders with strained relations or divergent interests. But science can also be utilized to gain competitive advantage over rivals.

Scientific knowledge becomes relevant in diplomacy when it provides information that can be utilized to maximize gains in a negotiation. Such use is especially important when high stakes are involved. Until the end of the Second World War, diplomatic relations among European states were characterized by fierce competition, which was sometimes attenuated by the establishment and reshaping of alliances. The fact that science diplomacy has been heralded in the last decades as an instrument for peace has led attention away from its role in the competition for power. This case discusses a paradigmatic example of competing interests: the European colonization of Africa in the late nineteenth century. The scientific study of African geography had a high strategic importance because it would map its natural resources, the routes of access to them, and the African kingdoms that could challenge colonization. Such political use of science was not necessarily seen as problematic in the past, but rather as a modern tool to more efficiently advocate for state interests.

The political role of scientific experts is usually confined to advisory functions. However, there are cases in which they have attained prominent political positions.

Scientific experts can acquire knowledge of political relevance via their studies, but they can also accrue power via the scientific networks in which they insert themselves. Formal and informal relations within these networks can facilitate the entrance of such experts in politics.

This case will provide a more complex picture of the ways in which science and diplomacy have interacted in the past. It will show how Bocage's scientific career brought him closer to Portuguese colonial and diplomatic affairs in the late nineteenth century, ultimately placing him in positions of high responsibility for the defense of Portugal's colonial claims in Africa.

J. V. Barbosa du Bocage: A career devoted to zoology

A central figure in this story is the Portuguese zoologist José Vicente Barbosa du Bocage (1823–1907). Bocage was trained in medicine, but he did not want to become a clinician. He applied to a professorship in zoology in 1848 at a recently founded higher education institution in Lisbon, the capital of the kingdom. With the death three years after of the regent of the Chair of Zoology, Bocage became full professor at a young age. In this quality, he strove to become a professional naturalist by studying animal specimens and publishing his results, participating in national and international scientific networks, joining academic societies such as the Lisbon Academy of Sciences, and mobilizing state funds to found the first natural history museum in Lisbon in 1862, ultimately becoming the director of its Zoological Section.

Developing scientific networks

Bocage maintained two types of networks in order to make a career in zoology. He started by reaching out to anyone who was willing to collect and supply to him the specimens he needed for his studies. At the same time, he fostered good relations with foreign scientific experts by corresponding and exchanging zoological specimens with them. Bocage's network of mostly non-specialist collaborators allowed him to discover new species, and the publication of his results in renowned scientific journals established an international reputation for himself.

When scientific and colonial networks meet

In developing a scientific network of collaborators, Bocage wanted from the start to go beyond Portugal's European borders. In mid-nineteenth century, Portugal's colonial presence spread to territories in Africa, Asia, and Oceania. Bocage took advantage of this existing colonial network in his search for more collaborators. At this point, his interests were mainly scientific: he knew that distant and largely unexplored lands with geographies and climates very different from Europe's would certainly be home to plenty of species yet unknown to science. Being the first to classify them would bring more attention to his work.

Bocage at first received specimens from scattered contributors; then things changed after coming into contact with José de Anchieta (c.1832–1897), a Portuguese explorer who was living in Angola, the most important Portuguese colony in Africa. Recognizing his qualities as a collector, Bocage proposed a more formal partnership. Anchieta accepted and in 1866 became a naturalist in the service of the Portuguese Crown, exploring many areas in Angola over decades and sending hundreds of specimens to Bocage. This long-lasting partnership was largely responsible for Bocage's career and allowed him to become an expert in Southwestern African fauna.

In the nineteenth century, scientific experts did not perceive the use of colonial networks as problematic. Bocage and other contemporary naturalists, including Darwin, relied on such networks, as well as on missions with clear economic and colonial aims to acquire rare specimens and launch a career. The scientific study of a nation's colonies by metropolitan agents was particularly valued not only because it reasserted colonial authority over those territories, but also in that it provided information on the economic potential of its natural resources, according to a utilitarian logic.

A political dimension of scientific endeavor

Bocage studied the geographical distribution of animal species, especially birds and reptiles, across the poorly known Angolan hinterland. However, his scientific activities also yielded information of political relevance. In the correspondence that Anchieta sent to Lisbon, he commented not just on African geography, climate, and fauna, but also on the action of colonial administrators, the African peoples he encountered, or the movements of foreign explorers – valuable first-hand information for the definition of effective colonial policies.

J. V. Barbosa du Bocage (1823–1907). Source: Anonymous, "Dr. José Vicente Barbosa du Bocage. Ministro da Marinha e Ultramar." O Occidente, February 11, 1883. Lisbon Newspaper Library.

The institutionalization of science for colonialism

By 1875, European colonial powers were increasingly interested in controlling African territories, with Britain having already questioned Portuguese colonial authority on some occasions. As a reaction, a part of the Portuguese elite who thought that successive executives provided only weak responses to such colonial challenges founded the Lisbon Geographical Society as a private lobby group to push for expansionist policies in Africa.

Any patriotic sentiments aside, Bocage joined the association as a way to defend his career, since his colonial collaborations hinged on the existence of a Portuguese Empire. However, he was more than just an interested elite member. By 1877, now with an internationally renowned career dedicated to African zoogeography, Bocage was perceived as one of the most knowledgeable people on Africa in Portugal, and he was elected president of the Lisbon Geographical Society.

The background

Why a Scramble for Africa in the late nineteenth century?

In 1870, Africa was sparsely colonized by Europe. By 1914, on the eve of the First World War, the continent had been partitioned in almost its entirety. Historians continue to debate the factors that contributed to a rapid expansionist move of European colonial powers to Africa. An important factor was that previous barriers were mitigated by developments in science, technology, and medicine. Steamships and railways led to faster and cheaper circulation of the military, the invention of automatic guns gave them competitive advantage to submit more numerous African peoples, and the isolation and mass production of quinine protected European troops and explorers against the deadly malaria. Such innovations appeared at a time of unprecedented British imperial expansion, which required securing commercial routes to distant areas, such as India. Once expansion reached Africa, Britain's rivals tried to block it by competing for territories, with both new and old colonial powers joining in a struggle for power and recognition.

Science: Geography and cartography

A colonialist role for geography

In 1870, African geography was mostly unknown to Europeans. Its scientific study had high strategic relevance, since it could be used to map the distribution of its natural resources, the routes of access, and the African kingdoms that could present challenges to colonization. Moreover, geographical knowledge was also crucial to delimit the spheres of influence of neighboring colonial rivals and hence avoid any diplomatic and military conflicts. Geographical societies multiplied in Europe in the last decades of the nineteenth century with clear imperial and colonial intentions. They prepared or sponsored geographical missions to Africa, organized congresses to share the results, and pushed the colonial agenda forward.

Cartography as a tool of empire

Geographical missions led explorers to travel to Africa with the instruments and mathematical knowledge necessary to calculate latitudes, longitudes, and other parameters. Such explorers were frequently military men, whose training prepared them to explore inhospitable territories as well as to conduct scientific studies. The information they gathered allowed the construction of maps that were used as tools of empire. They were clear, visual representations that summed the main features of a territory and could be used to plan colonial strategies for securing important areas.

Science as colonial ideology

In the late nineteenth century, most Europeans saw themselves as culturally and racially superior to other peoples, especially Africans. Anthropology incorporated such views, and Darwin's evolutionary theory was used to argue that Africans were human types less evolved than Europeans, and hence in need of their guidance. Science was used to promote racist ideologies (**scientific racism**), which presented European expansion in Africa as a "civilizing mission". **Such political utilization of science was widespread and not seen as problematic. In fact, it was considered modern in that it followed recent scientific developments, as well as trustworthy because science enjoyed a high social status in Europe as a knowledge-producing activity.**

An expanding colonial network

As president of the Lisbon Geographical Society, Bocage followed the discussions regarding the Portuguese colonization of Africa. In addition to his connections with European scientific experts and institutions, as well as with continental and colonial collaborators, he now joined extended colonial networks uniting military men, experts in additional scientific fields, private interests, politicians, and other members of the elite favorable to Portugal's expansion in Africa. Bocage participated in the organization of a Portuguese geographical expedition, the publication of colonial propaganda, and the discussion of reports to be sent to the government. He was now fully entangled in colonial affairs.

A path to politics

In the late 1870s, Bocage also became closer than ever to Portuguese politics. At this point, Portugal's Minister of the Navy and Overseas Territories was his decade-long friend João de Andrade Corvo (1824–1890), who also taught at Bocage's own higher education institution. Recognizing the knowledge and abilities of his friend, Corvo probably introduced Bocage to his fellow party members. In 1879, Bocage formally entered politics by being elected Member of Parliament. Two years later, he ascended to the upper Chamber of Peers.

In the second half of the nineteenth century, it was not unusual for Portuguese technoscientific experts to enter politics. Political activity was a faster route to social prestige, but the pervasive ideology that equated progress with science and fostered its use for the modernization of state administration also facilitated the path for such experts.

A political career

Reorganizing Portuguese colonial administration

Bocage entered one of the two main Portuguese parties that usually ruled the country in this period. In 1883, when it had already returned to power, Bocage was invited to become the Navy Minister and coordinate the Portuguese colonial administration. At that point, he had a sound experience in colonial affairs by having served as president of the Lisbon Geographical Society for seven years. He now had an opportunity to push for the reforms he had lobbied before. However, Bocage did not cope well with his new political responsibilities. He felt exhausted by the need to navigate the muddy waters of politics, and resigned after less than a year.

A new technoscientific organism for colonial policy

Nevertheless, Bocage did leave an important mark as Portugal's Navy Minister. Following concerns voiced at the Lisbon Geographical Society, he created a **Cartography Commission** within his Ministry with the aim of producing maps of strategic interest for colonial policies, with Africa in mind. At its outset a small organism, the Commission provided technical assistance to successive executives. **Such an organism placed technoscientific knowledge at the heart of political decision, thus recruiting it for strategic purposes.**

From colonial administration to foreign affairs

Bocage wanted to leave the executive before the end of 1883, but his party members urged him to stay, since they knew that his experience in colonial administration could still be put to use. At that moment, foreign affairs were dominated by colonial negotiations of African territories, and Bocage was persuaded to serve his country by being appointed Portugal's Minister of Foreign Affairs.

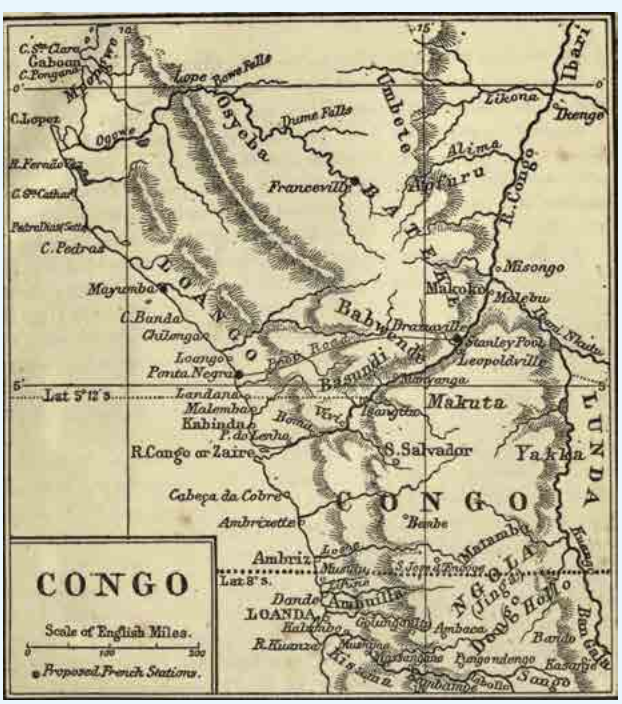
When he became the head figure of Portuguese diplomacy, Bocage was already part of important scientific, political, and colonial networks, in which he had amassed much power. Moreover, his practice as a scientific expert of recurrent dialogue with international colleagues also gave him a diplomatic flair.

Bocage reached foreign affairs when European colonial powers were scrambling to expand their sovereignty in Africa. Attentions were now directed to the Congo region.

Stakes: The European scramble for the Congo

The Congo was a much coveted region in Central Africa because it was said to be rich in natural resources. The Congo River connected it with the Southwestern African coast, which was accessible to Europe by sea, and the river had several navigable segments. Whoever controlled its margins thus controlled the potentially lucrative commerce with Central Africa. Portugal, France, and Belgium had competing interests in the Congo.

Portugal had been the first European nation to reach the region in the fifteenth century and make contact with the Kingdom of Kongo, which spanned the last hundred kilometers of the Congo River (lower Congo) but was now much weakened. Portugal wanted to seize it and extend sovereignty north from Angolan settlements further south. Such intention had diplomatic backing, since Portuguese colonial authority had been recognized between parallels 5°12'S and 8°S (see image), which included the lower Congo, by the set of treaties of the Vienna Congress in 1815. **France** had occupied Gabon, north of the Congo River mouth, and was expanding south, close to the 5°12'S parallel. **Belgium** was also sponsoring expeditions in Central Africa to occupy territories downstream the Congo River.



Theoretical boundaries of Portugal's colonial claims in the lower Congo (5°12'S to 8°S), according to the Vienna treaties of 1815. Source: African Committee of the Lisbon Geographical Society, Portugal and the Congo: A Statement. London: Edward Stanford, 1883.

Diplomacy as a tool of empire

The effective occupation of non-colonized territories was used to overcome claims of historical priority. Since building infrastructure required substantial funding and time, European colonial agents concentrated on extracting sovereignty cessions from African rulers. Such treaties could be used in Europe as proof of implantation on the ground. While Navy Minister, Bocage supported a Portuguese mission led by Angola's Governor General to coastal territories near the 5°12'S parallel, which succeeded in signing treaties in late 1883 in order to block French expansion. But Portugal also tried to reinforce its formal diplomatic backing. As Foreign Affairs Minister, Bocage concluded bilateral negotiations with Britain and signed a treaty that recognized its claims on the lower Congo in early 1884.

The Anglo-Portuguese treaty, however, was fiercely contested by France and Belgium. The diplomatic conflict grew when Germany publicly supported Belgian claims in an attempt to block British-allied Portugal. Faced with such backlash, Britain refused to formally ratify the treaty. In order to avoid further escalation, an international conference with all interested parties was convened in Berlin in November 1884.

Map of the Cabinda exclave (pink), as defined by the Portuguese Cartography Commission in 1886. The territory is completely disconnected from the rest of the Angola colony (pink) and surrounded by French- (green) and Belgian-controlled (yellow) areas.
Source: Chart of Cabinda, Molembo and Massabi territories, 1886. Portuguese National Library.

The Berlin Conference of 1884–1885

The Berlin Conference had technical sessions to negotiate how to redraw spheres of influence in the Congo region, which required expertise in African geography, and Bocage's action proved determinant. He made use of his networks and appointed two knowledgeable delegates. One was the Permanent Secretary of the Lisbon Geographical Society, with whom he had worked closely. The other was his son. Bocage had appointed him to the Cartography Commission, in which he had gained experience in African geography, and his father then instructed him personally on the Congo affair. Despite the enormous power asymmetries that placed Portugal at a disadvantage, Bocage's technical representatives were able to block attempts by rival European powers to seize the Congo region in its entirety.

Bocage's son ultimately used the treaties signed with African rulers north of the Congo (in the Cabinda region) as the decisive argument to secure Portugal's position, blocking the Belgian takeover of both margins. Although Portugal lost most of its claims to the lower Congo due to the pressure from its more powerful rivals, its sovereignty in some northern regions was still recognized, as well as in the southern margin of the last hundred kilometers of the Congo River. If the negotiations had been conducted by personalities who lacked extensive geographical knowledge about Africa, Portugal would have likely lost sovereignty to all territories on both margins of the Congo River.

Map of present-day Angola, including its northern Cabinda exclave.
Source: The World Factbook 2021. Washington, DC: Central Intelligence Agency, 2021.

Conclusions: An instrumental role for science in diplomacy in the 19th century

In the nineteenth century, scientific experts could acquire knowledge of political and diplomatic relevance thanks to the scientific networks and institutions in which they participated. At a time in which few of the Portuguese elite had direct knowledge of the African reality, and although Bocage never travelled to the continent, he was in a privileged position because he received first-hand information through his colonial collaborators. Moreover, joining the Lisbon Geographical Society and serving as its president placed him at the heart of colonial discussions, both political and scientific, in Portugal.

Proximity to influential politicians could rapidly propel a political career. Bocage's closeness to people in power who were able to appreciate his expertise on colonial affairs led to a meteoric political rise. In less than a decade, and despite having little previous political experience, Bocage was elected to parliament, headed two ministries, and conducted delicate diplomatic negotiations with European colonial powers that had important consequences for the organization of a new Portuguese Empire in Africa.

The utilization of scientific knowledge for political and diplomatic purposes was not perceived as problematic. While Minister of the Navy and Overseas Territories in 1883, Bocage even created a state organism that coordinated, compiled and analyzed scientific studies of African geography for colonial purposes: the Cartography Commission. It continued to assist Portuguese colonial policy, including military interventions, for several decades.

The utilization of science as a political and diplomatic instrument may have been a common occurrence in the past, especially to gain competitive advantage from rivals. The utilization of scientific knowledge in state affairs in the nineteenth century was perceived as a tool to promote efficiency and progress. Scientific studies provided evidence to support political decisions that could maximize gains, while lowering any costs. At the same time, optimistic views of science as a trustworthy means of producing answers to complex problems led to its association with notions of progress and the well-being of nations and their inhabitants.

Although the colonial gains for Portugal in the Berlin Conference of 1884 were far removed from its enormous ambitions, they were still remarkable for a nation whose rivals had much more political and economic power. After the Berlin Conference, Bocage continued to lead the Portuguese Ministry of Foreign Affairs for one more year, conducting negotiations with France for the demarcation of the borders of Portuguese Guinea as well as of the odd Cabinda exclave, hundreds of kilometers north of the bulk of the colony of Angola.

The use of geography in diplomacy was not exclusive to Portugal, but practiced by all European colonial powers in Africa. The scientific and diplomatic colonization of Africa preceded the effective occupation of the continent and the exploitation of its resources. This scientific-diplomatic process had long-term consequences: most of the now independent African states retain the borders that were defined in colonial times, and these are often at the center of disputes between neighboring countries.

Political boundaries of African colonies and states in 1914. Only Liberia and Abyssinia were not colonized. War Office, London (1918). Source: Gallica, FRBNF40718040.

Political boundaries of present-day African countries. Satellite imagery. Image credit: National Geospatial-Intelligence Agency Africa Atlas, The World Factbook 2021.

Study Questions

• Science diplomacy is usually presented as a means for cooperation. This case shows that it can also be used to compete with rivals. Are there other examples of such use? Were they more prevalent in the past than in the present?

• Would it be easy for a present-day scientist to ascend politically as Bocage did? How would such ascension be perceived by scientists? By politicians? By society at large?

• Would present-day scientists accept an instrumental use of science in politics as Bocage did in his own time? And in diplomacy?

Endnotes

• A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See Gamito-Marques D (2020) Science for competition among powers: Geographical knowledge, colonial-diplomatic networks, and the Scramble for Africa. Berichte zur Wissenschaftsgeschichte 43(4):473-492. doi.org/10.1002/bewi.202000016

• Cover image: Chart of Cabinda, Molembo and Massabi territories, 1886. Portuguese National Library.

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Credit: Ana Brigida

Selected Publications

(2021) A ciência ao serviço do império. Andrade Corvo, Barbosa du Bocage e a defesa das pretensões coloniais portuguesas em África. In Carneiro A, Mota TS, Amaral I (eds) Ciência, tecnologia e medicina na construção de Portugal. Volume 3: Identidade e 'missão civilizadora' – Séc. XIX. Tinta-da-China, Lisboa, pp 119–139

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Enacting Soft Power:

Cartoons, Technoscience Diplomacy and the 1890 British Ultimatum to Portugal

An InsSciDE Case Study

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The 1890 British Ultimatum to Portugal is usually presented in both Portuguese and European history as a strictly military, political and diplomatic conflict. We argue that it was also and above all an instance of (mostly hidden) technodiplomacy: that is, behind the direct military, political and diplomatic clash were (veiled) conflicting British and Portuguese claims over railroad infrastructures spanning the African continent and securing its economic resources. We use cartoons as primary sources to look at the events leading to the British Ultimatum from the perspective of a seldom-addressed layer of diplomatic communication: the unofficial visual representation of this diplomatic incident as appropriated by Rafael Bordalo Pinheiro, a politically committed and polyvalent Portuguese artist and journalist.

We claim that Bordalo Pinheiro's many cartoons, appearing in his satirical journal *Ponto nos ii*, acted as an instance of soft power by translating a complex web of technoscientifically-driven imperial interests into a simplified nationalistic narrative that effectively persuaded his readers that a political change was needed.

Often-disregarded sources such as cartoons may help us understand the scope of informal diplomacy, and show that technoscience diplomacy is not always about cooperation nor does it always generate win-win situations: on the contrary, it often discloses strong tensions and asymmetries of power.

Image credit: R. Bordalo Pinheiro, Álbum das Glórias, Sept. 1882

Keywords:
Bordalo Pinheiro, Scramble for Africa, British Ultimatum, cartoons, soft power, technoscience diplomacy

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Enacting Soft Power: Cartoons, Technoscience Diplomacy and the 1890 British Ultimatum to Portugal

On 16 January 1890, one of the most widely circulated Portuguese newspapers, *O Século*, posted on its front page a call to arms urging the people of Lisbon to rise against the British flotilla, the "cruel" and "savage" navy, which was supposedly sailing from Gibraltar to bombard Lisbon.

This was one of the many reactions to the Ultimatum of the British government, headed then by Prime Minister Lord Salisbury: a memorandum sent to Portugal on 11 January 1890 that triggered a wave of nationalistic fervor mixed with strong criticism of the monarchy. Its impact was so devastating for Portugal that it fostered the ascendancy of the republican movement and the eventual demise of the monarchical regime, twenty years later, in 1910.

The truth that lies beneath:

The technoscientific face of the British Ultimatum

The Ultimatum is usually presented in both Portuguese and European history as the result of a conventional military conflict. In this short study we claim otherwise and argue that it was mostly an instance of technodiplomacy; that is, we argue that behind the direct military clash were conflicting British and Portuguese claims over railroad infrastructures spanning the African continent and securing its economic resources. In other words, the "Serpa Pinto incident" that triggered the British Ultimatum exemplifies how Great Britain and Portugal deployed conflicting foreign policy strategies to gain power in Africa, combining the traditional diplomatic elements – attraction, cooperation, and influence – with aggressive infrastructure development.

We use cartoons as primary sources to look at the Ultimatum and its reception from a seldom addressed perspective of diplomatic communication: the unofficial visual representation of this diplomatic incident as appropriated by the satirical drawings of Rafael Bordalo Pinheiro published in the journal *Pontos nos ii* (*Dotting the i's*, 7 May 1885 to 5 February 1891).

The imperial stage

The Berlin Conference (1884-85) replaced historical rights to African territories (based on whose nation had arrived first in a certain region), with recognition given to the de facto occupier. These new rules gave way to what has been called the "Scramble for Africa" and turned Africa into an irresistible magnet for European industrial powers eager to secure new sources of raw materials and markets.

Great Britain was determined to control the African colonial chessboard, even if that meant going to war. At the core of British colonialism in Africa was Cecil Rhodes, a tycoon who used the so-called "imperial factor" – his collaboration with the British Government – to obtain both legal status and security for his mining operations. In 1889 Queen Victoria, through the British South Africa Company, granted Rhodes authority and rights to rule, police, and make new treaties and concessions. Circulation, communication and mobility were instrumental to the governance of the new territories under Rhodes' sovereignty, allowing troops to move quickly to hot spots, protecting white settlements, and fostering trade and mining.

Pontos nos ii approached the Portuguese technology-driven imperial strategy, mostly riding the growing flood of nationalism that blamed the monarchy for bowing to British impositions.

The Cape to Cairo railway line was one of the cornerstones of Rhodes's strategy: an "all red" line (that is, 100% under British control) connecting Cairo to Cape Town, running from north to south across the entire African continent. However, this enterprise was not without problems, as other European colonial powers – France, Portugal, Belgium, and Germany – had their own plans to keep a slice of the African territory. It was a matter of technodiplomacy, but not necessarily running towards a successful ending.

The "Pink Map", presented by Portugal to the European imperial powers following the Berlin Conference, represented the Portuguese claims to sovereignty in Africa: a contiguous, transcontinental colonial territory, stretching from the Atlantic Western coast of Angola to the Indian Eastern coast of Mozambique, linking Luanda to Lourenço Marques (now Maputo). The strategy designed by Portugal was to establish sovereignty in the inland territories between the two colonies (Angola and Mozambique) considered as a kind of "no man's land" (res nullius), that is, not formally claimed by any of the European powers despite various allegiances between local rulers and European countries.

In 1888 the Portuguese government instructed its representatives in Mozambique to make treaties of protection with the Yao chiefs southeast of Lake Nyasa and in the Shire Highlands. Two expeditions were organized: one under António Cardoso set off for Lake Nyasa; the second expedition under Serpa Pinto moved up to the Shire valley. At the same time, and aware of the Portuguese diplomatic efforts, the British Foreign Office instructed Henry Hamilton Johnston (British consul to Mozambique and the Interior) to report on the extent of Portuguese rule in the Zambezi and Shire valleys and to sign conditional treaties with local rulers outside Portuguese control in order to sabotage the Pink Map plan.

The Pink Map ("Mapa Cor-de-Rosa"), 1886. Wikipedia, © CC BY-SA 2.5

Bordalo Pinheiro's cartoons show the ambiguity of European imperial diplomacy that swung between meaningless peace treaties signed in embassy salons and full aggression on the ground.

In August 1889 Serpa Pinto encountered Johnston east of the Ruo river. The latter advised Serpa Pinto not to cross the river into the Shire Highlands. Nonetheless, he decided to cross the river into the Makololos' territory, leading to a minor armed conflict during which Serpa Pinto was accused of having ripped down the British flag.

The ensuing British overreaction was a pretext both to declare formal protectorates over these territories and to satisfy Cecil Rhodes' strong interests in the area. On 11 January 1890, Lord Salisbury sent the Portuguese government an ultimatum – later known as the British Ultimatum – demanding the withdrawal of the Portuguese troops from Mashonaland and Matabeleland (now Zimbabwe) and the Shire-Nyasa region (now Malawi), threatening otherwise to invade Portugal.

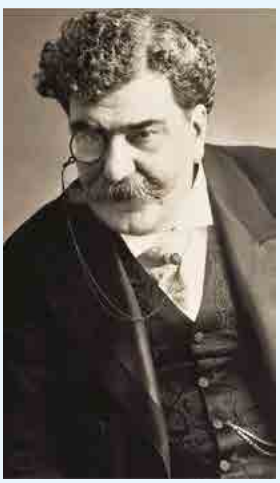
The British Ultimatum unleashed a chain of events that deeply affected Portuguese internal politics as the ultimatum was presented to and perceived by Portuguese public opinion as a vicious and cowardly attack on Portugal, and a national humiliation that became one of the main weapons used by the Republicans to overthrow the monarchy.

Protagonists and embodiments

This case study relies on two historical protagonists, the British (embodied by John Bull) and the Portuguese (embodied by Zé Povinho, a character designed by Bordalo Pinheiro to represent the common working class man), and their governments as portrayed by Bordalo Pinheiro's cartons in *Pontos nos ii*. In a way, one may claim that Bordalo Pinheiro and his journal are the true protagonists.

Champion of the emerging satirical press, which gained considerable momentum in Portugal in the last quarter of the 19th century, Bordalo Pinheiro drew cartoons that reached out to a very heterogeneous public, ranging from the knowledgeable elite to the illiterate masses. His satirical drawings and cartoons, sprinkled with ironic words or very short sentences, addressed political, social, moral and behavioral topics, and struck the expert and the lay public alike, captivating also the large illiterate fraction of the Portuguese population.

Bordalo Pinheiro was a politically committed and versatile Portuguese artist and journalist whose cartoons fought the monarchical status quo and voiced a republican and anti-clerical ethos, coming to exert a profound influence in Portuguese society.



Rafael Bordalo Pinheiro (1846-1905); cover page of Pontos nos ii, 1890 number 1. Both: Hemeroteca de Lisboa, public domain.

The weekly journal *Pontos nos ii* was published from 7 May 1885 to 5 February 1891. From mid-1889 onwards and until the journal's demise, colonial politics in the context of the Scramble for Africa and the new colonial order established by the Berlin Conference and later by the British Ultimatum to Portugal became dominant themes in *Pontos nos ii.*

Bordalo Pinheiro deployed a stepwise strategy based on three different typologies of cartoons that unfolded during 1890 and 1891: first to chastise the British African political agenda vis-à-vis

Portugal; second to reveal Britain's asymmetric, and therefore unethical, treatment of other European nations' ambitions in Africa, accommodating the powerful and demeaning the weak; and finally to castigate the Portuguese monarchical reaction to the British Ultimatum and to sway readers to the republican cause as the only acceptable nationalistic dénouement.

This confrontational narrative between John Bull (England) and Zé Povinho (Portugal) unfolds in three acts, from the Berlin Conference to the Ultimatum.

Bordalo Pinheiro used his cartoons as instances of soft power to shape the political understanding of the British-Portuguese technoscience diplomatic clash by leading his audience to believe that Portugal could have avoided humiliation had the government been based on republican values.

Cartoon diplomacy, act 1:

John Bull pulls off the Berlin Conference theft

Pontos nos ii conveyed a clear and simple message on the Berlin Conference: its goal was to allow Britain (John Bull), mainly through the so-called African companies (private ventures supported by the British crown, e.g. Cecil Rhodes' British South Africa Company), to take possession by force of the African territories that belonged to Portugal by historical right.

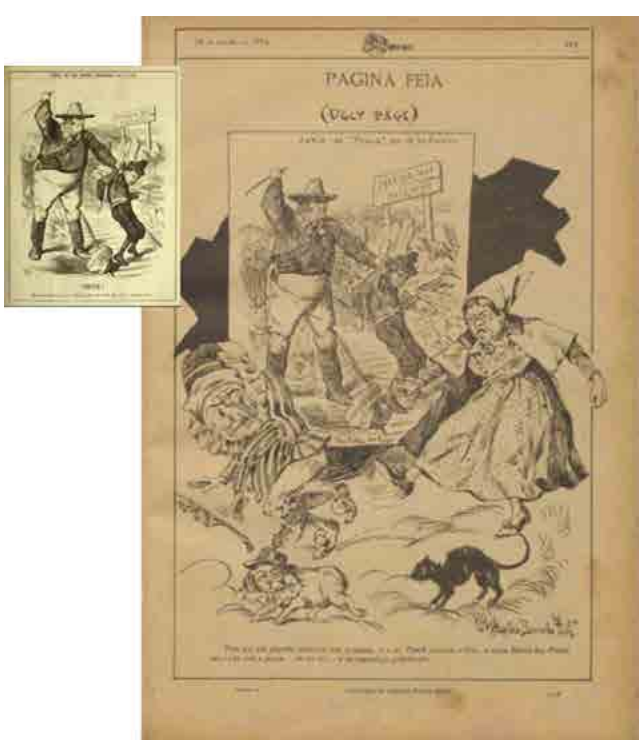
When in mid-July 1889 Serpa Pinto met Hamilton Johnston, both men knew that they were living the last moments of peace before the storm and that their moves in the following days would be decisive on the chessboard of power in colonial African territories.

On 13 July 1889, the famous English satirical journal *Punch* published a cartoon entitled "Cheek". This cartoon opened the door to a feral "war of cartoons" between *Punch* and *Pontos nos ii.*

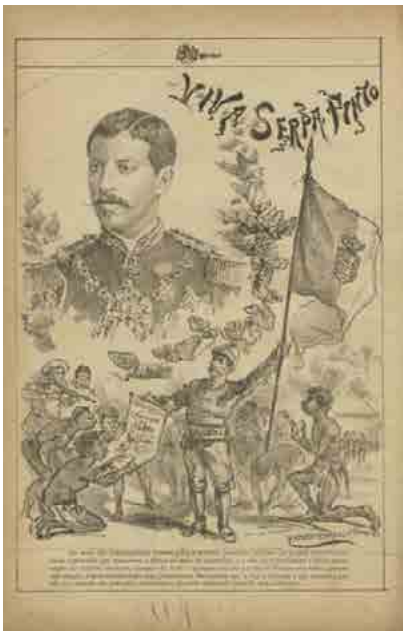
In "Cheek", an angry John Bull spanks "a mischievous little Portuguese", like a father disciplining his misbehaving little child who had put a rock on the railway track of the English-owned Delagoa Bay Railway line (Lourenço Marques railway) expropriated by Portugal. The cartoon brought to the fore the technodiplomatic dimension of the conflict. The rock stood as the visual metaphor for Portugal's request for international arbitration, which later decided against Portugal. The text that accompanied the cartoon reinforced the desire to humiliate Portugal. *Pontos nos ii* responded to *Punch* by publishing a rendition of "Cheek", this time expressing the Portuguese point of view.

It reproduced "Cheek" at the center flanked on the right by an angry Maria preparing to kick the behind of Mr. Punch, dressed as a buffoon, and running on the left of the page, while her black cat scares Mr. Punch's dog. The caption read: "A giant mistreats a dwarf, and Mr. Punch supports the act, our Mrs. Maria from *Pontos nos ii* lands her foot on the ... of the aforementioned buffoon." Appealing to the Portuguese readership, the message could not be clearer: despite the asymmetric power of the two nations on the political chessboard, Portugal could not be bullied. But the message was not addressed just to a national audience. Despite the universal visual impact of cartoons, a page-long text written in French reinforced the visual message and ensured that a detailed explanation voicing the Portuguese perspective reached foreign audiences. It was authored by Fernando Leal, a Portuguese poet, military man, scientist and explorer, who traveled extensively in Africa contributing to the assertion of Portuguese presence in Mozambique, and who was very critical of British imperialism, especially following the Berlin Conference.

While the weakness of the Portuguese monarchy was reinforced over and over by other cartoons, those who like Serpa Pinto fought in Africa against the English ambitions were revered and used to showcase Portuguese pride. A particularly paradigmatic cartoon shows the expeditionary Serpa Pinto hailed as a hero, holding the Portuguese flag while displaying to African natives a document that reads "Civilization=Railways".



"Página Feia/Ugly Page", Pontos nos ii (18 July 1889) 188 (at left, the Punch original). Hemeroteca de Lisboa, public domain.



"Viva Serpa Pinto", Pontos nos ii (9 January 1890) 237. Hemeroteca de Lisboa, public domain.

Cartoon diplomacy, act 2:

John Bull's alliances and betrayals

Pontos nos ii argued that not only did the Berlin Conference legitimize an unequal partition of Africa, but that Great Britain was the main beneficiary of the new rules, using its power to unfairly seize territories that belonged to other countries, namely Portugal. Furthermore, the British did it because Portugal, its older historical ally, was weak and, therefore, an easy prey.

The topic of the "two weights and two measures" – weak and servile when confronting strong countries (e.g. Germany, Russia, the United States); strong and tyrannical when dealing with small countries – is recurrent. From Bordalo Pinheiro's point of view, this cowardly position attested to British lack of scruples, sacrificing everything to profit.

"A Partilha d'África", Pontos nos ii (25 September 1890) 311. Hemeroteca de Lisboa, public domain.

Concerning this topic *Pontos nos ii* often used foreign cartoons, adding a few comments of its own. Building probably on the fact that this international dimension of the conflict attracted a wider attention in newspapers and magazines across Europe, the appropriation of external commentators' images reinforced the credibility of Bordalo Pinheiro's soft power strategy.

In a cartoon entitled "The Scramble for Africa", Bordalo Pinheiro used a cartoon published in the Dutch magazine *Amsterdamer* in which Lord Salisbury serves the largest portion of soup to Great Britain, of course, but also makes sure that Germany, its most powerful enemy, receives a large bowl, France a smaller one and Portugal finally very little to eat. Even so, Salisbury adds that if Portugal is not happy about having so little on his plate, nothing at all will be given to him.

In another particularly striking cartoon (also entitled "The Scramble for Africa") Bordalo Pinheiro appropriated two foreign cartoons, one from the German satirical magazine *Kladderadatsch*, a supporter of Bismarck's policies, and the other from *Punch*, linking them cleverly through his own character Zé Povinho.

In both appropriated cartoons, Germany is portrayed as claiming African territories under British rule. In the German cartoon, Great Britain is depicted as a weakling. John Bull says: "What did these Germans do to my flag [a reference to the flag that was at the core of the Ultimatum to stress the parallel with Portugal]? Oh, if only they were weak like Portugal...". In the cartoon republished from *Punch*, Germany is presented as an aggressive eagle ready to dominate local tribes. Connecting them, Zé Povinho comments on the irony of the German and the British being at odds when it should be Portugal that is furious for having lost its historical rights over African territories.

"A Partilha d'África", Pontos nos ii (25 September 1890) 274. Hemeroteca de Lisboa, public domain

Cartoon diplomacy, act 3:

John Bull steps over Zé Povinho

A large number of cartoons focuses on the two key events for Portugal in the context of the New Imperialism: the Ultimatum and the London treaty, signed on 20 August 1890, that formalized the Portuguese concessions in view of the British requirements detailed in the Ultimatum.

The Modus Vivendi treaty (14 November 1890), a simplified version of the London treaty, was the result of Portugal's pragmatic resignation to the inevitable opening of the Mozambican hinterland to British interests led by Cecil Rhodes, while Portugal still managed to maintain control over the remaining territories and particularly over the rich colony of Angola. Even if justified, the Modus Vivendi continued to be presented by the Republicans as just one more tool to perpetuate the British hegemony over Portugal.

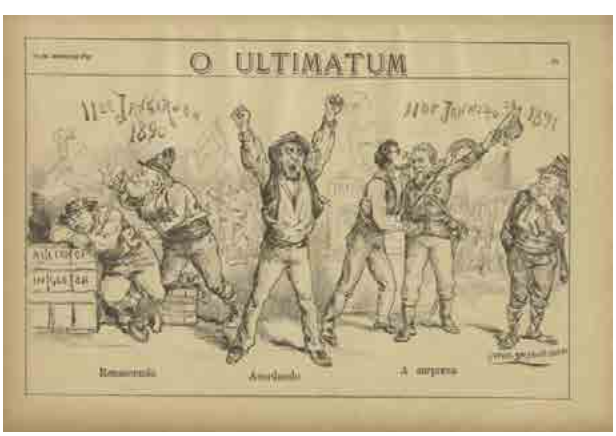
On 20 November 1890, shortly after the Modus Vivendi was signed, *Pontos nos ii* published a double cartoon that revisited and summarized the conflict that had unfolded over the course of the year between Portugal and Great Britain.

"The Ultimatum/Modus Vivendi", Pontos nos ii (10 November 1890) 282. Hemeroteca de Lisboa, public domain.

In the upper part of the cartoon John Bull threatens Portugal, portrayed as an old man, shooting the "Ultimatum" at him. On the left, side by side with John Bull, Salisbury waits for the right moment to advance over Africa and dominate the entire continent (holding a screw in his hand, the purpose of which is understood when looking at the second part of the cartoon). On the right, the Portuguese king cowardly flees, and in the background, the Portuguese golden era of maritime expansion is summoned by the iconic Belém Tower, a 16th century fortification that served as a point of embarkation and disembarkation for Portuguese explorers.

In the lower part of the cartoon, which reads Modus Vivendi in the title, John Bull positions himself over Africa in a very similar way as Cecil Rhodes is portrayed in a famous *Punch* cartoon: legs wide open straddling all Africa, feet firmly screwed down at both ends of the territory with the help of Portugal (seen inserting the right-hand screw). The message is clear: Africa is an "all-red" continent, no matter the Portuguese political and diplomatic claims.

Nearly a year after the Ultimatum, and in the face of the inability of the Portuguese king to oppose the British, nationalistic-driven protests continued, even if intermittently, and decisively strengthened the Republican Party. In January 1891, *Pontos nos ii* compares the old sleepy Zé Povinho of a year before resting on a trunk marked "Portuguese-British alliance" while John Bull stabs him in the back, to the newly awakened Zé Povinho who salutes a soldier involved in the republican military coup (31 January) that unsuccessfully tried to overthrow the monarchy in favor of a republican regime (which would finally be implemented in 1910).



"The Ultimatum", Pontos nos ii (10 January 1891) 289. Hemeroteca de Lisboa, public domain.

Conclusions: Cartoon diplomacy as an instance of informal technoscience diplomacy

Although Bordalo Pinheiro's cartoons in *Pontos nos ii* are often taken lightly, almost as plain jokes, they hide a strongly structured political agenda. The British Ultimatum is a technoscientific driven event that uses diplomacy to solve territorial conflicts in the context of the Scramble for Africa. *Pontos nos ii* conveys to a wide audience a systematic criticism of the Portuguese monarch's inability to negotiate on the international stage and assert the nation's rights.

Bordalo Pinheiro's cartoons enact an instance of soft power as they aim at shaping the political preferences of the readers in a seductive and apparently relaxed way. In a period antedating documentaries, the journal presents an informal, comic diplomatic spectacle, often laying out a sequence of cartoons whose meaning emerges and is enhanced by a sort of cinematic staging, mimicking the careful preparation of scenarios in diplomatic negotiations.

Science and technology are often important players in political and diplomatic disputes. Although they are again and again overshadowed by restrictive political narratives, we believe that using a different lens, namely from the history of science and technology and technoscience diplomacy, allows us to take a fresh look at old historical narratives.

Looking at Bordalo Pinheiro's cartoons in *Pontos nos ii* from the renewed perspective of informal technoscience diplomacy makes it possible to add new layers of understanding to the 1890 British Ultimatum at the European, colonial and national levels.

John Bull ceramic chamber pot, designed by Rafael Bordalo Pinheiro, produced in 1890.
Photo: Pedro Ribeiro Simões, CC Attribution 2.0Generic.

What are the lessons for European technoscience diplomacy?

To fully grasp the concept of technoscience diplomacy, it is necessary to take into account not only its contemporary formal dimension, but also its informal "lives" in historical periods in which the concept did not exist but its practice was, nonetheless, carried out.

The *longue durée* approach is thus critical to gaining an encompassing definition of the concept in order to grasp both the different strategies deployed by practitioners to achieve their goals and the possible means available to reach them.

This case study highlights how often-disregarded sources such as cartoons may contribute to better understanding the scope of informal diplomacy, and draws attention to the fact that technoscience diplomacy is not always about cooperation nor does it always generate win-win situations. On the contrary, it often discloses strong tensions and asymmetries of power.

Study Questions

• How can we use non-canonical sources (e.g. cartoons, tweets, TV news) to explore new avenues for science diplomacy and new actors?

• Discuss science diplomacy as a stage for cooperation but also for confrontation and tensions.

• Events are not free-floating: their relevance and impact change according to local conditions and the global balance of power. Using examples from today's news, social media or political cartoons, can you provide examples of warring (diplomatic) statements over technosciences?

Endnotes

• *Pontos nos ii* can be read here: http://hemerotecadigital.cm-lisboa.pt/OBRAS/PONTOS-NOSII/PontosnosII.htm

• Cover image: Zé Povinho. Source: pt.wikipedia.org/wiki/-Ficheiro:Zé_Povinho_(Álbum_-das_Glórias,_n.º_32,_Setembro_1882).png. Public domain.

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Paula Urze is a professor teaching sociology of organizations and socioeconomics of innovation, and science, technology, and society (STS) at NOVA University Lisbon. A researcher at CIUHCT, she leads sessions of the Portuguese Association of Sociology and is a coordinator of CIRC.LE Circular & Socio-Civic Learning Hub (Erasmus+). Her interests include open innovation, science diplomacy, and knowledge production and transfer.

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Scientists Attached to Diplomacy:

French and German Explorers Calling for Diplomatic Accreditation Before the First World War

An InsSciDE Case Study

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The figure of the scientist attached to a diplomatic mission appeared before the First World War, not after the Second as is commonly thought. Although such attachments were few in number and confined to a narrow circle, they shed light on a major historical feature of science diplomacy pertinent right up to the present day: the will and ability of scientists to mobilize diplomats. In a climate of competition, scientists indeed "politicized" the stakes underlying their research voyages abroad, in order to obtain the official recognition and immunity conferred by the status of diplomatic attaché. In the decades preceding the First World War, the rivalry between France and Germany proved to be fertile ground for both field research and the production of the first "scientific attachés".

Image credit: Bibliothèque nationale de France (gallica.bnf.fr)

Keywords:

Archaeology, geography, ethnology, diplomatic mission, scientific mission, commerce, nationalism

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Scientists Attached to Diplomacy:

French and German Explorers Calling for Diplomatic Accreditation Before the First World War

The term "scientific attaché" describing an agent dealing with scientific matters and linked to a diplomatic or consular representation appeared in Europe at the end of the 19th century. The discussions and occasional experiments around the creation of this role prepared the diplomatic corps for a scientific graft that would finally take the form of science attaché in the second half of the 20th century.

"Gentlemen, the experience of travel has taught us that too often, abroad, travelers dispatched by the government on scientific missions are not (...) welcomed and treated as they should be (...). I therefore express the wish that scientific travelers sent on mission by the Ministry of Public Instruction receive from the government some sort of title of official scientific attaché to the legations."

Charles Wiener, 1878 (Deloncle, 1879, p52)

Why and how should "travelers dispatched by the government on scientific missions" be protected and recognized as official envoys abroad? For the young and ambitious Franco-Austrian Charles Wiener, a popular explorer, the response was simple: it was in the interest of both individual scientists and the government covering their costs that they be given diplomatic status.

When Wiener called for the creation of the title of "*attaché scientifique*", non-career diplomats had already penetrated the French diplomatic apparatus, benefiting from temporary status as attachés with key foreign affairs specialization. Military attachés had been posted at some embassies since the 1850s, with naval attachés soon following. Financial and commercial attachés were seen from the first decade of the 20th century, and cultural attachés from the late 1930s onwards.

In this genealogy, the appearance of science attachés has usually been dated to the 1950s, in France and other countries alike, following the technoscience mobilization of the Second World War and the advent of so-called Big Science, which sparked national (and therefore also foreign) science policies. It is undeniable that several broad and lasting national networks of science attachés took root from mid-century. However, Wiener's proposal forces reconsideration of this widely accepted chronology, showing that in fact requests and experiments in view of conferring diplomatic status on scholars carrying out missions abroad existed as early as the end of the 19th century. This occurred not only in France but in Germany as well – hardly coincidentally, for these two countries were fierce competitors on the international scientific and diplomatic stages in the decades preceding the First World War.

Protagonists: Scientists on a mission

Varied profiles were found among the 19th century European scientists who claimed or obtained the status of "scientific attaché" as it was then called in French, German, or American English. Some, like Charles Wiener, were geographer-adventurers collecting all sorts of knowledge ranging across the natural sciences, linguistics, and archaeology. Others had a stronger academic profile and specialization, like the ethno-anthropologist and art theorist Ernst Grosse. All were part of scholarly networks emerging in parallel at national and international scale.

France's ministry of foreign affairs had already recognized the diplomatic importance of certain scientific missions by placing them under a consular umbrella: Assyriologist Paul-Emil Botta was named French consul in Mosul, 1842, so that he could investigate the biblical city of Nineveh; Ernest de Sarzec was appointed vice-consul in Basra in 1877 and immediately set out to seek Sumer. Wiener spoke on behalf of the much greater number of scientists craving to work in the field but who found no such royal road. In Germany, after a long period of caution the Foreign Office finally agreed to send Ludwig Borchardt to Cairo as *außerdiplomatischen wissenschaftlichen Attaché*. At the start of the 20th century Adolf Fischer was appointed to be the first *wissenschaftlicher Attaché* to the Peking legation, followed in 1907 by the architect Ernst Boerschmann, and in 1911 by Grosse.

This status was useful only insofar as it was recognized by the host state. Central or local host government authorities in archaeological destination states were not passive, but key protagonists too in this story. Despite the unequal balance of power with the Europeans, they had their own views and strategy, to the extent of course that these had not been formally excluded by colonization.

Stakes: Turning scientific voyages – or raids – into diplomatic relations

By requesting diplomatic status, scholars proposed that scientific missions become a component of the diplomatic relationship with the destination country. The stakes were both practical and political.

On the practical side, scholars sought embassy or consular support in order to connect with local authorities as well as with other representatives (such as the Navy) of their own mandating state. The travelers also hoped to acquire some protection from the threat of physical attacks or prosecution in lands where their intervention was not always welcomed, by virtue of the immunity traditionally guaranteed to diplomats. All in all, such relationships and immunity were essential to negotiate field access and then to extract data and resources conveniently. More and more countries levied export bans in response to private and state-sponsored raids on antiquities, starting in Rome in the 1800s, then in Greece and the Ottoman Empire (Egypt) towards the 1820s-1830s. Scientists like Wiener, who sent back to French public authorities nearly 4000 boxes of objects from South America alone, probably felt that obtaining diplomatic status would at least allow them to distinguish themselves from the many private actors who looted without a public mandate, essentially (but not exclusively) to supply the private collectors' market.

However, to justify their request to government, scientific travelers did not insist on the pressures they encountered locally. Instead, they pleaded the game of international competition, asking for help to win the race for knowledge and material finds that the modern nation-state needed to rise in global status. As symbols of prestige, national museums had to be filled with the best and most impressive pieces. Moreover, to get an edge on trade competition, intimate knowledge was needed of foreign countries and cultures. In 1911, Ernst Boerschmann argued for maintaining a scientific attaché at the German legation in Peking by pointing out the need to understand China in order to profit from its forced political and economic opening – something that other Western countries, as well as Japan, did not hesitate to do, according to him.

Scholars thus actively constructed the political stakes of their missions, without denying their more personal motivations such as the vivid desire to learn and to gain recognition. Imperialist power shaped the application and reach of the sciences it needed; so did scientists try to harness the political power they needed.

Wiener's wish

Born in Austria and trained in France, Charles Wiener was a young language teacher in a Parisian high school when he obtained funding from the French ministry of public instruction's *Service des Missions Scientifiques et Littéraires* (Scientific and Literary Missions Department) for a 14-month "archaeological and ethnographic" mission to Peru and Bolivia. Formed in 1842 and reformed in 1874 by the addition of a commission of some twenty leading scholars responsible for giving advice to the minister, the department selected and financed scientific missions deemed worthy of governmental support. Wiener's own mission started in 1875. Over the course of 21 months, Wiener enjoyed the support of the French diplomat stationed in Lima, Ludovic d'Aubigny, who interceded with central and local authorities "with the most gracious solicitude" (Wiener, 1880/2010). Soon enough though he ran out of money and approached French naval personnel in the Pacific to provide him with logistical assistance. The station commander was finally moved by the patriotic argument that a French scientist should not be left destitute while Germans enriched the collections of museums across the Rhine.

On the strength of this experience, Wiener upon his return would seek to make life easier with his "wish that scientific travelers sent on mission by the Ministry of Public Instruction receive from the government some sort of title of official scientific attaché to the legations" (this and the following quotes in this paragraph are drawn from Deloncle, 1879). The title would facilitate gaining the support of French representatives – embassies, consulates and also military forces – and would strengthen scientists' legitimacy in the eyes of local authorities as well as their security under diplomatic immunity. For the man who saw his mission as a "great struggle against a world and men" the proposal was not lightly made. Formulated at the inaugural meeting of the French Geographical Societies in early September 1878, Wiener's wish met with both general approval and the active support of influential luminaries. Among these, Henri Duveyrier, the world famous explorer of the Sahara, confirmed that he had "experienced the need for the title that Mr. Wiener requires for travelers on scientific missions." His book *Afrique nécrologique* (1874) told the story of colleagues who had died – or were assassinated – while exploring the continent. His friend Charles Maunoir, who would long be secretary general of the Paris regional Society and chief lobbyist for exploration missions, approved and rephrased the wish, suggesting instead that the ministry of public instruction "should ask the Ministry of Foreign Affairs to grant the title of scientific attaché to the legations for travelers on mission". The wish was unanimously adopted by the inaugural assembly.

Wiener's expedition made him a prominent figure in Paris. He was awarded the légion d'honneur and then naturalized as a French citizen. He convinced the authorities to create an ethnographic museum of material cultures foreign to Europe – the basis of the current Quai Branly-Jacques Chirac Museum in Paris. However, he did not meet his goal of creating the title of attaché scientifique. The ministry of foreign affairs appears to have refrained from populating its diplomatic and consular posts with scholars who were both uncontrollable and in one way or another expensive. Nonetheless, it offered Wiener the position of vice-consul of Guayaquil (Ecuador), in the footsteps of other scholars appointed as consuls before him, notably his "dear master" Léonce Angrand, a specialist of pre-Columbian civilization who had been consul general for twenty years. In October 1879, Wiener was able to embark on a new 14-month exploration. The aim was to find "a natural trade route, (...) putting the Entre-Cordillera, the inaccessible granary of South America, in communication with (...) France" (Wiener 1881) and thereby beat the English, Americans and Germans in establishing exchange with this exceedingly rich resource.

The clearly political framing of his new mission did not prevent Wiener from carrying out innumerable surveys of scientific interest over more than 3,000 km of riverways, gathering barometric, astronomical, ethnographic and linguistic data. Vice-Consul Wiener embodied a continuum along science, commerce and diplomacy, which he would have liked to freeze and formalize temporarily through the title of scientific attaché. Entering the consular career through science, he gradually moved away from it as he progressed in the diplomatic corps, reaching in 1899 the high rank of minister plenipotentiary.

Charles Wiener (1851-1913). Source : gallica.bnf.fr

The idea of posting *attachés scientifiques* did not reappear in France until the First World War. The ministry of foreign affairs continued to favor integration into the consular system on a case-by-case basis, particularly in contexts where – unlike in Rome, Athens, Cairo or later Saigon – there was no permanent scientific mission in the form of the uniquely French institution of the *Ecole française*.

The meanings of missions

If religious missions were undertakings of spiritual conquest, scientific missions were undertakings of scholarly conquest. Although the two were distinct, they were nonetheless linked. Since the late Middle Ages, European religious missions had uncovered, created and circulated knowledge from which would spring disciplines such as ethnology; conversely, they were also at the forefront of knowledge transfers from Europe, to the Chinese imperial court for example. The "civilizing" mission that the Europeans set themselves in the 19th century secularized this heritage in the colonial movement. Science and technology occupied a central place as instruments of both domination and "development", of taking and giving, in a dynamic expansion of the European order.

Field sciences:

Mapping and extracting resources from abroad

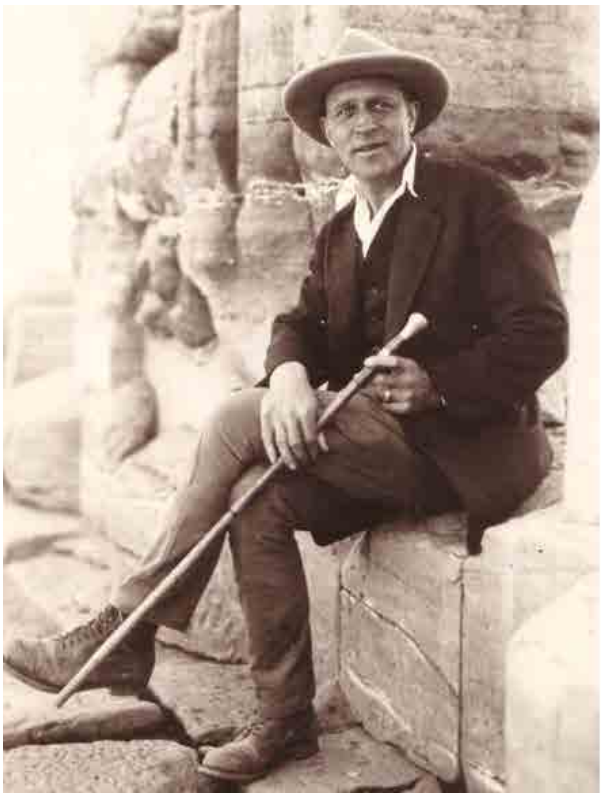
Historian Suzanne Marchand (2015) accounts for 19th century dynamics of modern European field sciences such as archaeology, geography or ethnography with two key concepts.

The first key is "open door science", thanks to which "Europeans ranged more or less freely across the world, and used their access, their superior wealth, and sometimes their imperial power to extract vast collections of flora, fauna, and archaeological treasure." Doors might be opened by local authorities as in Japan, or access forced as in China – obliged to open its harbors to foreigners after the two Opium Wars (1839-1842; 1856-1860).

Secondly, field investigations took place in the context of an "antiquities rush", defined as "a roughly simultaneous attempt by several individuals or states to take advantage of an opportune moment to extract antiquities for export". Archaeologists, but more broadly all sample collectors, were able to leverage national resources and sponsorship for this extraction – fueled by a shared attraction to novelty, conferring status and recognition to modern states and individual explorers alike. The competition among states was simultaneously a harsh competition among scholars, internally and at international scale.

"Außerdiplomatischen wissenschaftlichen Attaché"

In Germany too, it was the learned communities that pushed for the diplomatic accreditation of scientists, using the same argument of international competition (in particular with regard to their neighbor across the Rhine), while the diplomatic corps was reluctant. Here again, the game was played outside Europe, first in Egypt and then in China. The outcome, however, differed in that the German scientists, unlike the French, finally won their case.



Ludwig Borchardt (1863-1938). Source: ancientegyptian-facts.com/pyramid-of-sneferu-at-meidum.html/-egyptologist-ludwig-borchardt

In Egypt, Chancellor Bismarck's discrete strategy of the 1880s was to favor the ongoing competition there between the French and the British, thus preventing these two powers from joining forces against Germany. In the scientific domain, this translated into a lack of state support for German field Egyptology, while the active French had taken charge of the country's antiquities service in the late 1850s, set up an academic base in Cairo in 1880 and went on expending energy trying to keep the British on the sidelines. In 1898, the *Ecole française* was formalized under the name of the French Institute for Oriental Archaeology in Cairo. The light German mission in Cairo by now was feeling very much pushed out. Adolf Erman, the powerful founder of the Berlin School of Egyptology, in turn sent a request to his ministry for official diplomatic status for the German mission in order to obtain support and consideration from the local authorities. True to its traditional strategy, the German Foreign Office, which saw Franco-British rivalries culminating in Fashoda in Sudan – scene of a crisis in the struggle for control of East Africa – hesitated and then finally agreed to create a title of attaché, "but under certain conditions, namely that it could be suspended at any time, that it would not enjoy diplomatic status, that it would remain under the control of the Consulate General and that the British and French representations would not issue a contrary opinion" (Voss, 2012). Trained in architecture and Egyptology in Berlin under Erman, Ludwig Borchardt was appointed *außerdiplomatischen wissenschaftlichen Attaché*, extra-diplomatic scientific attaché, at the German Consulate General in Cairo in September 1899.

Although "extra-diplomatic", Borchardt used his title to start important excavations at Tell el-Amarna. He was thus able to "discover" the bust of Nefertiti in 1912 and obtain its transfer to Berlin, where it quickly attracted the crowds. The "Mona Lisa of Berlin" has been the subject of dispute with Egypt since the 1920s.

Chancellor Angela Merkel visited Nefertiti in 2009. Source: Alamy 2D260E0.

From Egypt to China

German Egyptologists' situation however did not brighten. They continued to complain of Germanophobia and lack of professionalism among British and French scholars who, for the latter, "even when copying the simplest inscriptions (...) cannot manage to give a line without it being wrong in several places," as Erman wrote to the German ministry of cultural affairs in May 1900. The German consul delayed, but through joint pressure, Erman and Borchardt obtained the creation in 1907 of the Imperial German Institute in Cairo for Egyptian Antiquities,

of which Borchardt became director. The Foreign Office nonetheless continued to refuse to fund excavations in Egypt. Contrary to what the French thought and said at the time, neither the extra-diplomatic attaché nor the Institute were thus tools of German foreign policy. Instead, they depended on the dedication of Egyptologists and their private supporters.

Three other German *wissenschaftlicher attachés* were appointed in the 1900s, in China, this time not "extra-diplomatic" but accredited. While France's strategy in Asia was to establish once again a permanent archaeological mission (in Indo-China as of 1898), Adolf Fischer was simply attached to the embassy in Peking (1904-1907), developing German collections and knowledge with a flow of objects and information from the civilizations of China, Japan and Korea. Architect Ernst Boerschmann requested to join the Peking legation in December 1906 as an "attaché" or "scientific expert". In that position he carried out a complete survey of religious monuments, for – as he later asserted – knowledge of Chinese religion and cultural representations would be of great use for completing Germany's commercial conquest of China. His work was very closely supervised: each of his excursions had to be validated by the legation's representative, his reports sent to the Foreign Office and his files left in good order for any successor. The ethnologist, Sinologist and art theorist Ernst Grosse was attached to the Peking legation until 1913.

German scientists thus obtained diplomatic accreditation for a handful of individuals, compensating for the lack of permanent institutes abroad like those enjoyed by French scientists.

Attachés towards Europe:

Pork and science diplomacy

A separate bilateral dispute with a scientific dimension may have contributed to the German Foreign Office's view on granting "extra-diplomatic" attaché status to Borchardt in Cairo in 1899. German Egyptology may have been indirectly served in this way by the American meat trade.

In 1898, the United States requested diplomatic accreditation for an "agricultural and scientific attaché" in Berlin. Charles W. Stiles was sent by the U.S. department of agriculture when Germany imposed hygiene measures on imports of American pork accused of carrying trichinosis, a serious disease for humans. Appointed to the international commission on zoological nomenclature after having reconciled the French and Germans at a critical juncture of the International Zoological Congress of 1895, Stiles was a renowned zoological diplomat. A parasitologist and microscopist trained in Germany, he above all spoke the language and was well introduced. His investigation quickly cleared the American outgoing inspection services and invalidated the complaints of their German counterparts. Protectionist measures continued, but could no longer hide behind a public health argument. Convinced by this successful experience, the U.S. ministry sent more "agricultural attachés" abroad, but it was not until the First World War that it posted "scientific attachés" again: this time in Paris, London and Rome, to fight against Berlin.

At least one other scientific attaché was sent to Europe before the war. Clotilde Luisi (1882-1969) was "the first female scientific attaché at the Embassy of the Republic of Uruguay in Brussels" according to the French newspaper *La Presse* (22 March 1912). A special educator of the deaf and dumb, she was involved in the creation of a pan-American student network. Luisi was also her country's first female lawyer. The duration and content of her Brussels mission remain unknown.

Charles Wardell Stiles (1867-1941). Source: Special Collections, USDA National Agricultural Library. nal.usda.gov/exhibits/speccoll/items/show/8157

Conclusions: Immunizing science

Today's science attachés have common ancestors in the first few "scientific attachés" sent from (and to) Europe in the decades preceding the First World War. French and German scientists requested this appointment themselves in order to confer a diplomatic character on a scientific undertaking conducted abroad. Scientists as well as their supporting scholarly and (often private) funding networks expected that an attaché would gain protective immunity and official recognition by host authorities and the legitimacy to mobilize, as needed, their own state representatives *in situ*. To gain attaché status, scientists essentially offered increased state prestige through the extraction of resources to enrich the collections of national museums, and also promised better commercial penetration through the construction of useful knowledge. Their requests were thus a form of instrumentalization of diplomacy in the service of scientists, in a mutually beneficial relationship whose terms were defined by the scholars themselves.

In France, the collective request for diplomatic status initiated in 1878 by Charles Wiener went unheeded. In Germany, by contrast, Egyptologists and Orientalists won their case. While scholars on both sides leveraged the argument of political competition between nations, it was not the weight of this argument that made the difference, but the institutional context. French authorities supported the establishment of scientific institutions abroad and included scholars in the consular corps, whereas the German authorities favored, at least initially, the nomination of a handful of scientific attachés with, and in one case without, diplomatic accreditation. In the same period, Europe received short-term scientific attachés from the USA and Uruguay.

These experimental configurations were interrupted by the First World War, before being profoundly transformed during the conflict. At that time, reinforced cooperation between the United States and its European allies through the reciprocal exchange of scientific attachés became seen as an arm likely to hasten victory over the enemy camp. Science and diplomacy thus formed a new alliance, to be strengthened again mid-century. The establishment after the Second World War of the science attaché program – as we call and know it still today – was first and foremost marked by these military experiences. The rush this time targeted the precious resource of knowledge. In the early years of this renewal, something that had been a matter of course in the 19th century came up for debate in most chancelleries: shouldn't science attachés be able to carry on personal scientific activities while on diplomatic mission? Strengthening attachés' credibility locally and their employability back home was, and in many countries probably still is, an issue.

Stakeholder Takeaways

For diplomats	For scientists	Overall
• 19th c scientific attachés used diplomacy to build valuable social links, knowledge and reputation; they aimed at securing extractive activities. • 20th c science attachés often used social links, knowledge and their reputation to build valuable diplomatic relations; they aimed at cooperating, opening flows of knowledge between peer countries. • There is no historical determinism: France refused to create scientific attaché positions in the late 19th c but 100 years later developed one of the largest global networks of science counselors and attachés.	• Science diplomacy is both about science using diplomacy and diplomacy using science. When they interact, they co-shape each other. •19th century export bans transformed archaeological practices and finds: deeper local relationships, longer, more attentive fieldwork; focus not only on art but also on traces of social structures. • The massive arrival of objects outside the usual Greco-Roman canons shook Eurocentric views of art and transformed European aesthetics.	• The activity of a science diplomat is not a given: it ranges widely between doing science with a diplomatic status and doing diplomacy with a scientific title.

Study Questions

• Were you surprised to learn about the active role by explorers and archaeologists in the creation of the science attaché role? Was the U.S. example of the "agricultural and scientific attaché" (Stiles) more expected?

• Who has more to gain today from the creation of an attaché post – scientists or states, or even other interests? What are the motivations and goals?

• The early scientific attachés, or the states that mandated them, were often eager to remove natural resources and cultural goods from host countries. Does this past handicap science diplomatic relations today?

• Today the restitution of cultural property is on the agenda. What prospect does this open up for European science diplomacy?

• The "scientific attaché" was an innovation that took time to be established. Today are new roles needed that have not yet been understood or accepted? Who is asking for them? Who should be active in their creation?

Endnotes

• This InsSciDE work will be more fully discussed in a forthcoming peer-reviewed article: Laborie, L (in preparation) Attachés scientifiques. La difficile greffe de la science sur le corps diplomatique (fin 19e siècle - années 1950).

• Cover image: The intrepid Charles Wiener (1851-1913) inspired some of the adventures of Hergé's Tintin. In this image drawn from his book Voyage to Peru and Bolivia (1880/2010) he is depicted accessing a cave between Chuvin de Huantar and Huanuco Viejo. Source: Bibliothèque nationale de France (gallica.bnf.fr).

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Selected Publications

(with Bledniak S, Matamoros I, Virgili F) (eds) (2022) Chroniques de l'Europe. CNRS Editions, Paris

(with Arapostathis S) (2020) Governing technosciences in the age of grand challenges. A European historical perspective on the entanglement of science, technology, diplomacy, and democracy. Technology & Culture 61(1):318-332. doi.org/10.1353/tech.2020.0005

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International Activities of the French Academy of Sciences:

Understanding the Role of Academies in Deploying Science Diplomacy

An InsSciDE Case Study

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The strategy of diversification of a national science diplomacy can be supported by the academies which structure a significant part of a country's scientific life. Academies' international activities offer a channel for the initiatives taken by state diplomacy. Beyond the network constituted by their members, national and foreign, since the last quarter of the 20th century academies have typically become actors pursuing their own international policy combining universal values and the will to promote the science of their own country.

In order to rely on this resource, national diplomacy (or in the future a European Union diplomacy) must understand the specific characteristics of these institutions, which are the result of a long-term historical construction. Several features have evolved considerably since the latter part of the 20th century. Diplomats will do well to become familiar with their academies' culture, recognize their specific objectives and take into account their strengths and weaknesses regarding international action. The example of the French Academy of Sciences cannot be generalized to all such institutions. Its ability to network with other academies and other institutions and its various initiatives in the international sphere, give us a vantage point from which to indicate the main elements structuring the international action of these unique actors of science diplomacy.

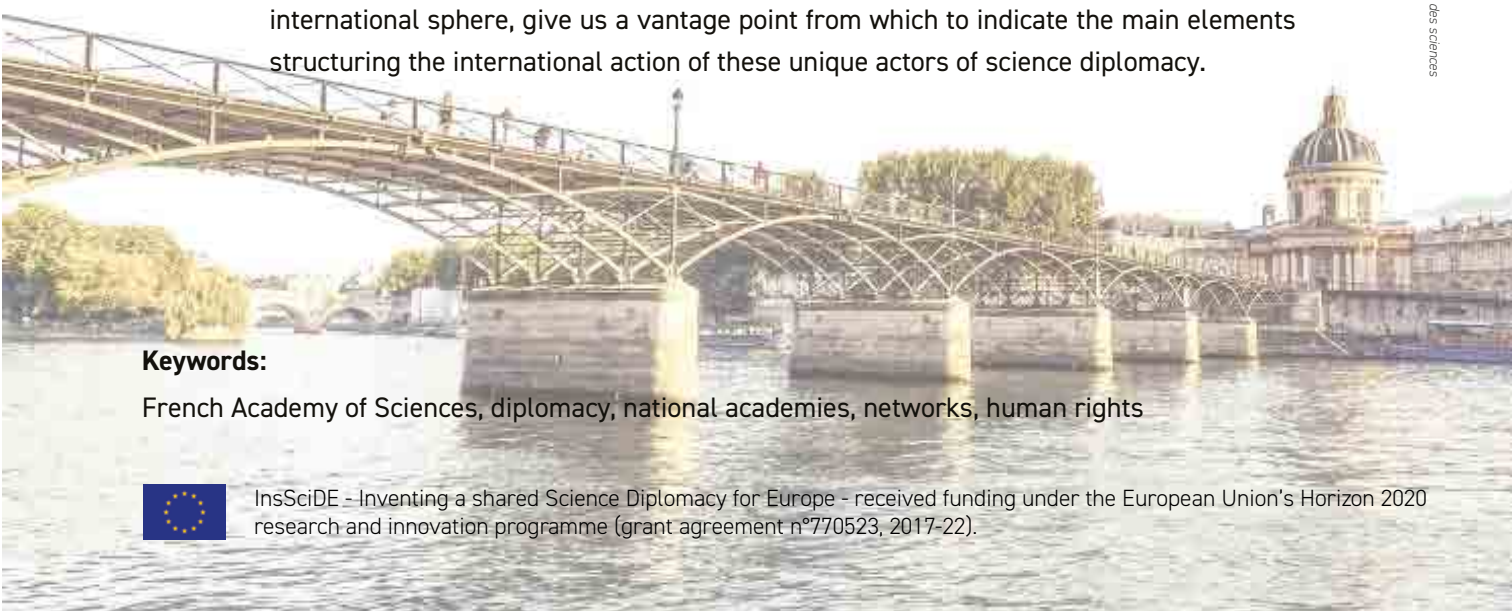

Image credit: Académie des sciences

Keywords:

French Academy of Sciences, diplomacy, national academies, networks, human rights

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International Activities of the French Academy of Sciences:
Understanding the Role of Academies in Deploying Science Diplomacy

The strategy of diversification of a state's science diplomacy can be supported by the action of the national academies. In order to rely on them, national diplomacy – or in the future a European Union diplomacy – must understand the specific characteristics of these institutions, which are the result of a long-term historical construction. While the example of the French Academy of Sciences cannot be generalized, its involvement with many institutional interlocutors and partners in international affairs makes it an enlightening example in the science diplomacy space.

The first science academies were created in Europe in the 17th century. The Accademia dei Lincei, founded in 1603 in Rome, was the first among them, followed in 1660 by the Royal Society in London. The Académie des Sciences was created in Paris in 1666 by Colbert, minister of Louis XIV. Academician Bernard Le Bovier de Fontenelle wrote in 1707: "Monsieur Colbert ... knew that the sciences and the arts alone would suffice to make a reign glorious; that they extend the language of a nation perhaps more than conquests; that they give it the empire of the mind and of industry, equally flattering and useful; that they attract to it a multitude of foreigners, who enrich it by their curiosity, take on its inclinations, and attach themselves to its official interests with foreign learned societies."

Portrait of Bernard de Fontenelle circa 1705-1750. M. Dossier after H. Rigaud. Source: © The Trustees of the British Museum

Internationalization: A challenging reorganization supported after a time by the Ministry of Foreign Affairs

Over the centuries, the French Academy of Sciences has enjoyed international influence created by specific initiatives towards international counterparts, as well as through direct links established by its members or bilateral member exchanges. These activities however did not take root in permanent structures or committees. A change began in the 1970s-1980s when the number of proposals from national academies of science or scientific institutions to establish closer relations with the French Academy of Sciences increased very significantly. Some of them – and this was radically new – proposed to sign cooperation agreements.

The International Relations Committee (CORI), composed of six members elected by the academicians, was created in this light in November 1982. The committee was entrusted with the very institutional relations with the International Council of Scientific Unions (ICSU). However, its competence covered a much wider field, rich in potential initiatives. The founding text states: "It elaborates the proposals to be presented to the Academy concerning initiatives and directives likely to assert the points of view of the French scientific community within the [ICSU]. The relations with any international or foreign scientific institution and the study of any provision likely to increase the international influence of the Academy and of our country, in particular with the French-speaking countries and the developing countries, also fall under its attributions."

The first contacts were made with foreign academies in order to organize and formalize their cooperation with the French Academy of Sciences. After three centuries of informal relations the Royal Academy did not wish "to conclude a formal agreement,"

while being eager to " increase [the] exchanges without delay." The signature of conventions institutionalizing inter-academic relations nevertheless developed rapidly. Ten agreements with foreign academies were signed between 1982 and 1988.

With limited human and material resources at its disposal and wishing not to overlap its initiatives with those of the *Centre national de la recherche scientifique* (CNRS) and the Ministries of Research or Foreign Affairs, CORI decided to concentrate its efforts on developing relations with "high-level personalities who can have an impact on collaboration between the research organizations of [two selected] countries." For this purpose, it began to develop projects with the cultural services of French embassies abroad, which often were ready to give financial support to initiatives ratified by the two respective national academies. The number of exchanges of lecturers and the organization of colloquiums thus multiplied.

In 1992, under the initiative of Minister Roland Dumas, the Quai d'Orsay (Ministry of Foreign Affairs, MFA) exchanged more closely with the Academy and provided it with specific resources enabling it to create a Department of International Relations (DRI). The MFA opened a budgetary line of 400,000 francs, increasing to 600,000 francs in 2002. With four project managers in 2003, the DRI was able to organize its "bilateral colloquia". It supported summer schools in countries such as Romania, Vietnam and India. The DRI also allocated travel grants and fellowships to foreign researchers living in France. The proliferation of bilateral relations within Europe led academies to engage in multilateral structures intended to better organize inter-academic work.

These means and this organization gave a greater scope to the actions of the Academy. In December 1997, for instance, it signed an agreement with the United States National Academy of Sciences, the first ever signed between the two academies, although the French Academy had been created in 1666 and the American Academy in 1863. Rapid urbanization, the water cycle and education were identified as major topics for exchange.

Source: Academy of Sciences, Facebook 15 February 2016

The actors

First and foremost are the academicians, especially those involved in the Academy's international activities. They are few in number. Beyond their role in academic organizational structures, their personal profile shapes their actions and must be well-known in order for them to be seen as relevant actors. Indeed they intervene most effectively at the crossroads between the Academy's institutional network and their personal networks that are primarily scientific and professional, but also political or even more broadly socio-cultural. The philosophical and even religious sensibilities of the academicians are another variable that can sometimes be significant. Each of them thus offers a personal network connected to the Academy's action. The effectiveness of the Academy, while not reduced to the sum of what its members bring to it, depends in part on these personal resources and in a variable manner depending on the issue, whether it concerns access to information or the capacity to influence.

The Academy against the French national interest: The "delicate" question of human space flight

In the 1980s France committed very important means to the Hermes spaceplane project, and mobilized its diplomatic services to seek for this project the support of European member states. The Academy of Sciences could logically be regarded as a fulcrum. However, this was not to be. A report of the Academy of Sciences clearly dissociated itself from the choices of the French government, doubting the utility of a human presence in earth orbit. The Academy questioned the impact of piloted flight on France's scientific and technical development and recommended the choice of automated systems. Taking the point of view of the French researchers, it called for "assurance that the means intended to prepare human flights in space will not be taken from the means currently allocated to the whole of scientific research." The media effect was explosive. *France-Soir* titled on 6 December 1988: "Man in space is money lost! ... Robots would do better for less money, says the head of space research of the Academy of Sciences." The article continued: "Indignation under the dome: the 'Immortals' usually so wise are angry." This stand was particularly badly received within the French space industry given that at the same time, French astronaut Jean-Loup Chrétien was in orbit in the Mir station.

Later, with remarkable consistency given the criticism heard over its supposed lack of support for national ambition, the Academy put the heat on the European Space Agency's research laboratory for the International Space Station. On 12 December 1990, Le Monde specified, astonished: "the Lady of Quai Conti [a

reference to the Academy's historic headquarters] chose to visit her wrath on one of the most consensual themes of the decade: the European space policy. No doubt some teeth will grind when reading the three acid pages that the Academy has just published on the European Columbus program." The frontier between "scientific" and "industrial" points of view was clearly drawn, although national interest was at stake with French companies involved in the aerospace industry. Such controversies highlight that the Academy of Sciences was not "subject" to the orientations of national diplomacy. If, to a large extent, the interests of the Ministry of Foreign Affairs and the Academy converged, the radically different positions on crewed flight demonstrated that convergence was neither pre-ordained nor automatic.

The question of human rights:

A diplomatic role assumed despite initial hesitations

In 1978, taking note of initiatives by individual members in support of scholars deprived of their freedom, the academician Jean-Claude Pecker proposed that the Academy launch a collective approach through the creation of a Human Rights Commission. This proposal opened significant debate. What balance could be established between science and "politics"? Internally, the academicians underlined "the importance of the problem" but also: "the caution and discretion that the Academy must exercise". The question was considered "political", a word tinged with mistrust. Wasn't the Academy in danger of stepping out of its true role?

After several plenary exchanges and despite some reluctance, a Committee for the Defense of Scientists (CODHOS) was nonetheless formed in May 1978 to address "human rights violations of which Men of Science are victims". Its members decided to concentrate their "action on individual cases, rather than dealing with actions involving too many people." The first files examined were those of B. Levitch and S. Kovalyov (USSR), J.L Massera (Uruguay), and E. Pasquini (Argentina).

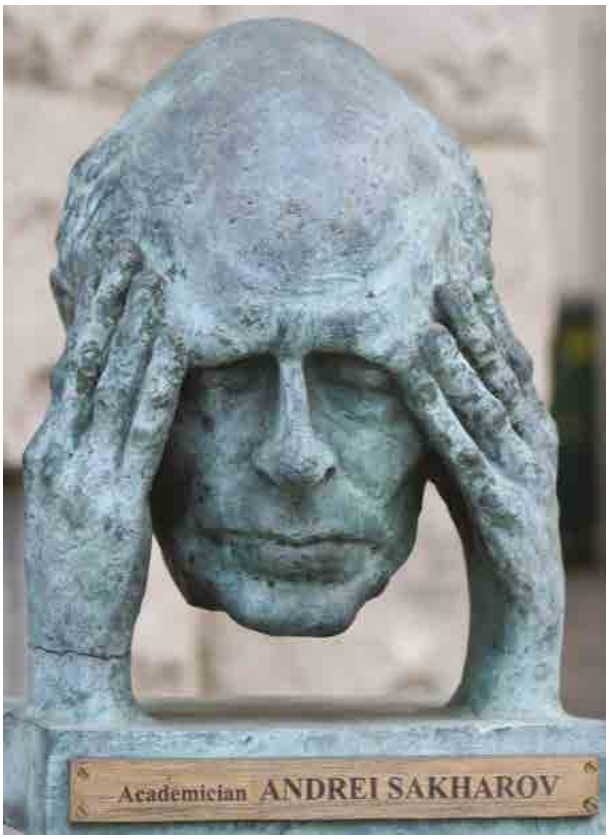
However, the question of coherence between this initiative and more classical Academy actions was quickly raised. In 1978 while the mock trial of physicist Yuri Orlov was taking place in Moscow, the simultaneous election by the Academy of three Soviets as associate members opened a broad discussion. What formal declaration could explain this election – a solution suggested by some – without giving the impression of trying to justify itself to the Soviet regime, an issue emphasized by others? A vote was held to choose between alternative wordings for a telegram to be sent to the president of the Academy of Sciences of the USSR: "an expression of the emotion felt by the Academy" or "the emotion expressed by many colleagues."

"Bridge Outside the Louvre", leading to the Institut de France, seat of the Academy of Sciences and four other academies. Photo by Nan Palmero, Creative Commons Attribution 2.0 Generic License.

By forty votes to 13, the first formulation committing the Academy in its entirety was chosen. When dissident scientist Andrei Sakharov, recipient of the Nobel Prize for Peace in 1975, was sentenced to internal exile in 1980 the Academy again sent a telegram to inform that president of its "... deep emotion...", and to tell him: "... that the measure which strikes the physicist Andrei Sakharov can only harm the continuation and development of scientific relations between [our] two countries". In the spring of 1982, Pecker and another physicist and academician Louis Michel went to Moscow to personally deliver to Sakharov the invitation from the Academy of Sciences for the official celebration of his election as a foreign member.

The issue of human rights prompted the Academy of Sciences to work in a more organized way with its counterparts and with various NGOs. At the international level, CODHOS also played a significant role in the establishment of an informal but active network of major academies committed to the defense of human rights. Coordination between the French and American committees became effective from 1982, followed the next year by settling similar cooperation with the Swedish Academy of Sciences. Over time, a larger scope and contribution to global initiatives were established by cooperation with the ICSU committees on the "free circulation of scientists" and "safeguard of the pursuit of science". Coordination with scientific organizations was gradually supplemented by joint actions with organi-

zations specifically focused on the defense of human rights. Over the course of time, CODHOS diversified the reach of its activities in relation to political changes in the world. CODHOS' latest online report (2019) mentions the cases of researchers living in Bahrain, China, Hungary, Iran, Sudan, Turkey and Vietnam.



Andrei Sakharov. Photo by David, Creative Commons Attribution 2.0 Generic License.

International initiatives in the face of a new geopolitical order

The beginnings of structured international action had come about in the context of the Cold War. The fall of the Berlin Wall, the strengthening of "emerging" powers and the opening up of China created in the 1990s a new situation which, by diversifying modes of interrelation, offered the Academy new spaces for action and new challenges.

The fall of the Berlin Wall and resulting hopes as well as uncertainties raised the question of relations with the countries of the former Soviet bloc. In 1992 representatives of various scientific institutions met in London to consider the relations that should in the future be maintained with Russia. This resulted in the creation within the Academy of a group for "East-West relations," whose title underlines how difficult it was to adapt perceptions to such a radical change.

North-south was also concerned. In January 1997 a permanent committee, COPED (Committee for Developing Countries), was created within the Academy of Sciences in order to better contribute to the development of the InterAcademy Panel.

The era also confirmed the rapprochement with China. The scientific relations of the Academy with Beijing had until then been carried out through the exclusive intermediary and the sole impetus of the Franco-Chinese Foundation for Science and its Applications (FFCSA). This foundation gradually moved closer to the Academy in such a way that it became possible to envision joint projects and close collaboration. Following two meetings in Beijing in 2008, the Academy of Sciences and the Chinese Academy of Sciences signed a cooperation agreement in Paris at the end of that year.

Relations with Africa were also crucial. Yves Quéré, Delegate for International Relations since 1992, was invited to the 1996 inauguration of the Academy of Sciences of South Africa taking place just two years after the election of President Nelson Mandela. The "Science and developing countries - French-speaking sub-Saharan Africa report" laid the foundation for new initiatives aimed at the region. The Academy offered to assist countries wishing to set up an organization comparable to its own. This was the case with Algeria for example. In 2014 Mohamed Mebarki, Minister of Higher Education and Scientific

Independence and long-term support for interactions

Within the framework of diplomatic initiatives, academies are valuable conduits and sources of knowledge that are not sufficiently mobilized. The fact that the Academy of Sciences has built up more visible and competent communication in the social space also makes it, beyond a more traditional vision of influence, a potential ally for the public diplomacy of France.

Academies generally lack endowment, and joint actions with diplomatic services would be facilitated if regular funding were earmarked at ministerial level. To be effective, however, such support must respect two principles. The first is the absolute respect of academic independence. The second is that it must be long-term. While perhaps difficult to be met without reserve on a yearly basis, these two conditions can be guaranteed when specific themes are clearly identified and agreed, enabling a real co-construction of actions that contribute to ongoing strategies related to e.g. development or the environment. National diplomacy must accept that on certain issues, the academic initiatives are not those it would have chosen. The richness of the collaboration can only flourish if this freedom is accepted.

Research, and Catherine Bréchignac, Permanent Secretary of the French Academy of Sciences, signed a memorandum of understanding on cooperative partnership actions to finalize the process of creation of the future Academy of Sciences and Technologies of Algeria.

Networking academies

Whether at worldwide or European scale, the creation of "global" academies not linked to any governmental structure was a challenge for the Academy of Sciences and all its counterparts that existed with strong links with their respective governments.

The World Academy of Sciences (now abbreviated as UNESCO-TWAS), known as the Academy of sciences for the developing world, was created in 1983 without direct links to the national academies. Faced with such an initiative, the latter had to become more visible and cooperate better. In October 1993, the French Academy of Sciences joined other delegations representing some sixty academies at a meeting called in New Delhi by the Indian National Science Academy (INSA) to address issues of world demography and development. In January 1995, again in New Delhi, this initiative was consolidated with the creation of a global network of science academies called IAP (InterAcademy Panel on international issues), to which 72 national academies belonged, alongside members TWAS, the African Academy of Sciences, the Federation of Asian Academies (FASAS), and the International Council of Scientific Unions (ICSU). Headquarters were established in Washington, D.C., with the Delegate for International Relations of the US Academy of Sciences and the President of INSA as co-chairs. The low visibility of European academies was corrected in 2016 by bringing together three established networks of academies of science, medicine and engineering, namely IAP, the InterAcademy Medical Panel (IAMP) and the InterAcademy Council (IAC); one of the two co-presidencies was based in Paris.

The creation of integrated European academies represented another challenge for the national academies. These new institutions, Academia Europaea (1988) and the European Academy of Letters, Sciences and Arts (1990), decided to bypass national academies and to co-opt their members directly in all the European states. Their operation and effectiveness were quickly brought into question. Academician (and director of the Atomic Energy Commissariat) Robert Dautray, despite the fact that he belonged to not only the French Academy of Sciences but also Academia Europaea, considered that the new academies were condemned, by their huge scale, to be less useful than national Academies.

Nevertheless, single and centralized bodies could become potential rivals for the national academies. The major national academies focused their effort on the creation in 1994 of ALLEA (All European Academies), stabilizing it by fostering the election of a President to be supported by a permanent secretariat in Amsterdam. Today it gathers over 50 academies, from a total of more than 40 EU Member States and non-EU countries.
Founded in 2001, the European Academies' Science Advisory Council (EASAC) is a network complementary to ALLEA. It brings together the National Academies of Science of the EU Member States, Norway, Switzerland and the United Kingdom to provide independent science-based advice on important challenges for Europe.

Which diplomatic space for Europe?

Through their many initiatives, the Academies of Science of the Member States are well represented in the international scientific arena and in the public debate. More generally, the establishment of networks such as ALLEA or EASAC, which are already called upon for scientific advice and expertise, could be natural allies for a European science diplomacy structured by its values and by the desire to take up global challenges. Synergies already exist and could no doubt be developed on the basis of respect for academic independence. The European External Action Service (EEAS) could thus involve the academies more than it does at present in the work of the science counselors in the delegations. The international action of European academic networks and, depending on the theme, that of national academies, could be encouraged by providing them with greater resources, financed by the Commission. This would encourage long-term action and the affirmation of a common vision. A long-term association of the academies in the process of defining the main lines of European science policy would link them more strongly to its dissemination at international level. This co-construction would have indirect effects in terms of influence and would contribute, within the framework of public diplomacy, to gaining the support of public opinion. ALLEA's decision in 2022 to join the European University Association and Science Europe in the European Commission's core group working on reforming research assessment shows that this direction is relevant. Clearly, the academies and their networks are assets still insufficiently valued for the emergence of a shared science diplomacy for Europe.

Conclusions

The Academy of Sciences has long taken a very significant, albeit discreet, role in France's science diplomacy, even before this terminology was recognized. The structuring of this action took place from the 1980s on the basis of very modest funding, supported irregularly by the Ministry of Foreign Affairs. The Academy has nevertheless taken a significant place in international scientific relations. It is part of the networks built up since the 1980s, defending the original model of the Academies of Science. This ties them to their national governments while ensuring their independence. By engaging in the creation of networks of European academies, it furthermore promotes science diplomacy shared by European countries. On March 2, 2022 the Academy of Sciences, on the proposal of CODHOS, published a recommendation concerning the consequences of the war of aggression pursued by Russia in Ukraine.

The Academy of Sciences has thus moved from an international role based on the individual action of its members to a structure that allows it to take its place as an institution, and, in a collective manner, in international relations. This action has been particularly visible on a number of specific themes but remains handicapped by a lack of structural resources. Since the 1980s, debates within the Society have highlighted the tensions between scientific ambition and values and the contingencies of politics. They emphasize that a diplomatic contribution of the Academy can only be materialized by strictly respecting its independence and supporting its action on themes chosen in such a way that its values are respected. The organization of the Academy of Sciences' international activities does not mean that the role of the academicians has been completely absorbed into the collective. More numerous and younger, thanks to the institutional reforms carried out since the beginning of the century, the academicians of science form a diverse community made up of men and women who are jealous of their independence and have a personal vision. Any action carried out in partnership with the institution must carefully take these specificities into account.

Stakeholder Takeaways

For diplomatic services

- Academies' contributions to science diplomacy result from a variety of trajectories.
- Academies' decisions to act must be rooted in consensus, which can take time to build.
- Beyond official roles and procedures, it is essential to build up informal links with members of the academy who play a driving role in light of their professional network and/or their convictions.
- A working relationship with the academy can be established through an approach that respects the culture of the institution and takes into account the lack of means that often weighs on its action.

For academies

- As science diplomacy involves more and more numerous and diversified actors, both at the national and European levels, academies move to promote their original assets and thus differentiate themselves.
- Academies' place as the voice of science is no longer self-evident and their actions must be made visible by focusing on clearly identified fields. These actions are best structured in a way to be sustainable across changes in governance and material resources.
- These tools also come with problems.

Overall

- Very diverse and unique actions can be implemented by academies and diplomatic services in partnership.
- The discreet diplomacy based on the privileged international links woven by the academies and their members can constitute a precious resource especially in times of crisis.
- At the other end of the spectrum, through their recent but constant involvement in communication with the public, academies can be associated with the most innovative forms of public diplomacy. Here, the inter-academic networks that they have built up constitute an important additional asset.

Study Questions

• Which national or European foreign policy goals could be well-served by cooperation with academies of science, medicine, engineering, etc., or by networked academies?

• Which new initiatives could be imagined in a partnership between an academy of sciences and national diplomatic services? Or between national or regional/global academies, and centralized or decentralized European diplomacy?

Endnotes

• Sites of interest:
https://www.academie-sciences.fr/en/
https://allea.org
https://easac.eu

• Cover image: Academy of Sciences, Facebook 12 November 2019.
www.facebook.com/AcadSciences/photos/2531795960434136

Read all our science diplomacy case studies!
Visit: zenodo.org/communities/insscide

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Science Diplomacy in the Field

An Immersion in the Life of Science Counselors of the European Union

An InsSciDE Case Study

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The posting of science attachés to diplomatic representations abroad is a tool particularly suited to the implementation of a science diplomacy strategy. The European Commission embarked on this practice by the end of the last century and today there are twelve science counselors stationed in European Union (EU) delegations worldwide. All of them were interviewed for this study, the first to date devoted to the particular profile and missions of the EU's science counselors. Our investigation revealed their essential cross-cutting missions: promoting the European framework research programs, and coordinating enhanced foreign-facing initiatives with Member States' own science attachés. This case study examines and discusses the science counselors' contribution to the implementation of European-level science diplomacy.

Image credit: @EU_EEAS

Keywords:

EEAS, science counselor, science attaché, EU delegation

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Science Diplomacy in the Field:

An Immersion in the Life of Science Counselors of the European Union

Deploying a network of science attachés to embassies across the globe is generally recognized as a strong marker and a powerful tool of any national science diplomacy (SD) strategy. But how is this question approached at the level of the European Union (EU)? The European Commission embarked on this practice by the end of the last century and today there are twelve "science counselors" (SCs) stationed in EU delegations worldwide. Our case study documents the particular profile and missions of these agents who belong to the generic category of "science attachés" and to whom no study has been devoted as such to date. Relying on both an informal written survey and semi-structured interviews conducted in the Spring of 2020 with all the SCs in post, with officials in headquarters and with former SCs, our case study provides access to detailed empirical knowledge of the network of SCs of the European External Action Service (EEAS). It opens up avenues for reflection on the subject of complementarity and coordination of SD initiatives of the Union and of the Member States (MSs) in the field. It also contributes to the ongoing discussion of what constitutes a science diplomat.

Protagonists: Who are the EU science counselors?

Science counselors of the EU come under two profiles: expatriates from headquarters, and local recruits. At the time of our study, eight SCs were expatriates from the permanent staff of the European Commission (stationed in Brazil, China, Ethiopia, India, Israel, Japan, Russia and USA) and four were locally recruited staff (stationed in Australia, Canada, Egypt and South Korea). Expatriates normally occupy their post for a period of four years. Local recruits have more stability in their position, as their recruitment term is not set in advance: those we interviewed had been in their post for 8.2 years on average.

Natural and medical sciences dominated (8) over social sciences, humanities or law (4) in the disciplinary training of the SCs. Most had academic training in natural sciences followed by an experience in research. While in principle SC positions are open to candidates from any Commission directorate, in 2020 all expatriated SCs came from the Directorate General for Research and Innovation (DG RTD) where many had spent a significant part of their career; their seniority at the Commission was high (22 years on average). The professional background of locally recruited SCs was more diverse; they had held positions in research, government, and/or business. Having networks in academia or government in the country of posting seemed to be among their significant qualifications.

Source: EEAS.

The EU science counselors' network

We use the term "network" to designate the informal body embracing SCs in post, their local support staff and their various supervisory authorities. We describe here this network and analyze its internal functioning.

SCs are subject to three hierarchical authorities. The head of mission at the SCs' respective delegation is their immediate supervisor. SCs have at least weekly exchanges with their head of mission. Half of them reported daily exchanges. At Brussels headquarters, two Directorates General – the European External Action Service (EEAS) and Directorate General for Research and Innovation (DG RTD) – supervise their activity. Within the latter, the Directorate of International Cooperation ("Directorate H") ensures the operational follow-up of SCs' activities and has an overall vision of the network. For a majority of SCs, contacts by email or phone calls with DG RTD occur on a daily basis.

SCs are nominated by DG RTD for assignment to the delegations which are under the direct supervision of EEAS. Interaction between EEAS and SCs was reported to be irregular and often indirect. It may be limited to a few formal contacts per year, for example during annual bilateral meetings under partnership agreements. Nonetheless, it is through EEAS – within which a position of science and technology adviser has been created recently - that the political dimension of SCs' engagement in the field is channeled. EEAS plays an essential role in setting the overall external policy framework and defining the EU's external political position, as well as elaborating the agendas and roadmaps to be implemented with each host country.

All SCs feed insights by uploading a brief policy report to the DG RTD internal portal at the beginning of each month. In addition, they provide ad hoc reports on various subjects, either at the request of their hierarchy or of some other service in Brussels, or at their own initiative. They must also provide a 15- to 20-page annual report of their activity in post. During the period of our survey, the monitoring of the COVID-19 pandemic generated very regular feedback from the field to the headquarters.

The logic of building a network over time

By the first semester of 2020, there were twelve SCs posted to EU delegations to eleven countries (Australia, Brazil, Canada, China, Egypt, India, Israel, Japan, Russia, South Korea, USA) and one posted to the EU delegation to the African Union (in Addis Ababa, Ethiopia). Since that date, the development of the network has been marked by the creation of a position in the United Kingdom after Brexit, but also by the closure of the position at the delegation to Brazil.

The building of the SC network started in the late 1970s/early 1980s in North America, in which the science and technology (S&T) relationship was coupled with a strong commercial relationship. The EU's first-ever SC position was created in Canada in 1977, with a particular profile: it has been occupied since the beginning by a local agent devoting only one-third of his time to S&T issues, the main part being dedicated to trade issues. The first-ever position occupied by an expatriate from the Commission was created in the United States in the early 1980s. With both of these countries, the signing of an S&T cooperation agreement with the EU would follow in the 1990s. The opening of the post in Japan also came early (mid-1980s). At the turn of the millennium interest in BRICS emerged, with the creation of SC positions in Brazil, India and Russia – quickly followed by the signature of S&T agreements and strategic partnerships between these countries and the EU. More generally, S&T agreements have been signed by the EU with 10 of the 12 countries where an SC held a post in 2020.

The network has evolved over time, with jobs opening in regular rhythm. Geographical coverage seems well balanced, with SC positions on all continents. While reflecting progressive adaptation to various circumstances and constraints, the development of the network was driven in time and in space by a scientific as well as a geopolitical rationality. The world distribution of SCs suggests that the European Commission is looking for a close relationship with the countries that matter most in global scientific production: in 2020, there was an SC in each of the countries occupying the nine top places in international science rankings by number of scientific publications (excluding EU countries; see table next page). This does not hold, however, for postings in Egypt and Ethiopia (African Union), for which the SC's mission is regional in scope. Moreover, Israel ranks well below the other EC SC station countries for scientific publications but stands out as the sole country associate of the Union's research framework programs in which an SC has been established. The network's configuration also reflects geopolitical rationality. Nine SCs are located in a country (or region: Africa) that has signed a strategic partnership agreement with the EU. The most recent change besides the posting of an EU SC in the UK was the reopening of the position in Addis Ababa, as Africa entered the geopolitical priorities of the new Commission installed in 2019. While fitting into the broader objectives of the Union's external policy, assignments of EU SCs emphasize and consolidate the S&T dimension of these partnerships.

Beyond the specificities of local contexts and of host countries' relationships with the EU, two essential cross-cutting missions

emerged from our study. First, SCs promote and support the Framework Programmes for Research and Technological Development (FPs) as flagship products and powerful tools of the international projection of the Union's research policy. Second, SCs are tasked with field coordination: they organize the exchange of information with their MS counterparts and foster joint actions addressing institutions and potential partners in host countries.

Country/ Rank		↓ Documents	Citable documents
1		United States	13817725
2		China	7454602
3		United Kingdom	4039729
5		Japan	3074206
7		India	2128896
9		Canada	2037509
10		Australia	1638743
12		Russian Federation	1359443
13		South Korea	1307978
14		Brazil	1145853

Top ranked non-EU countries by number of scientific journal publications (combined 1996-2020 Scopus data). Adapted from Scimago Lab www.scimagojr.com/countryrank.php

Daily duties of the EU science counselors

SCs deal with the bilateral relationship between the EU and their country of assignment in all its aspects of science, research, technology and innovation. They publicize EU policies and programs through events such as "Destination Europe" or "Research and Innovation Day", or via roadshows across the country carried out in concert with representatives of MS embassies. SCs monitor the bilateral policy dialogue on key issues such as climate change, clean energy, sustainable urbanization or the EU Digital Agenda. They raise awareness of opportunities for career development in Europe and for cooperation with European researchers. They analyze and report on research and innovation developments in the host country. They organize meetings, visits, seminars, and workshops with MS representatives and with local partners. They plan visits to the country by high level officials from headquarters. More generally, they act as representatives of the EU, of its ideas, values and actions. Our interviews revealed that over time, the work of the SC has acquired a more political and strategic dimension, at the expense of its technical dimension.

EU science counselors as promoters of Framework Programmes

The European Union's pluriannual Framework Programmes are the spearhead of the action of SCs. Interviewees reported that they are "*essential*", they are "***the main frameworks of the STI [science, technology and innovation] collaborative activities***", "*the primary tool for scientific cooperation*". Promoting Horizon 2020, the biggest multilateral research program in the world (the 8th FP, succeeded in 2021 by Horizon Europe) is "*the most important task*", "*the reason why we are here*", and "*a main item which I should sell to our counterpart.*" All the activities that revolve around this program "*are not only important, they are our bread and butter!*". This discourse echoes the importance given by the Directorate General RTD to such programs, which have been the vehicle par excellence of the soft power of the EU in the S&T area.

Publicizing and promoting cooperation under the FPs are essential aspects of the dialogue with host country research institutions. Horizon 2020-related actions were described as "*key elements in our dissemination activities (22 presentations in 2019)*"; "*the info sessions that I regularly offer to universities across the country … represent and will continue to represent the main focus of my missions*". Information meetings are all

the more necessary as potential partners in host countries must face the complexity of European procedures: they feel that it is "*complicated to understand the mechanism*", as "*EU's Horizon 2020 is a well-known brand but considered a bit complicated compared to bilateral cooperation*". Meetings with potential partners also try to dispel concerns about the imbalance between parties: the EU "*wants to sell its agendas*" and "*many topics are Eurocentric*". Therefore, the task is to find correspondences between the EU's and the country's research priorities. Nonetheless, according to interviewees, working methods are ill-perceived: the EU takes a "*one size fits all approach*", it wants to "*keep control of governance*", it "*selects and evaluates the projects, and imposes on them its framework conditions (gender, open access, etc.)*" that the partners must respect. Comparatively, cooperation within the framework of national programs is considered "*simpler*", "*more straightforward*", and implying "*less administrative work*".

Technoscience domains and initiatives mentioned during the interviews

- Arctic research
- Climate change
- Digital Agenda; information and communication technologies
- Green Deal
- Health/biotech
- Energy, clean energy
- Nanotechnology
- Satellite navigation
- Sustainable urbanization
- Sustainable Development Goals

Horizon 2020 (2014-2020) and Horizon Europe (2021-27) associated countries

As of February 2022:

1. Albania*
2. Armenia*
3. Bosnia and Herzegovina
4. Faroe Islands*
5. Georgia
6. Iceland
7. Israel
8. Moldova
9. Montenegro
10. North Macedonia
11. Norway
12. Serbia
13. Switzerland #
14. Tunisia*
15. Turkey
16. Ukraine*

Kosovo°, Morocco, and the United Kingdom are in the process of becoming associated to Horizon Europe.

Key:

Associated to both programs

*Associated to H2020, transitioning to Horizon Europe

Treated as a non associated third country under Horizon Europe

° This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

EU science counselors interacting with Member States science attachés

Information sharing and joint actions

In a given country, the SC typically brings together counterparts in charge of S&T at embassies of MSs and of countries associated to the FPs. These local meetings take place every two or three months, allowing to share up-to-date information, keep each other informed on initiatives and projects, and discuss the organization of joint events. These meetings may also facilitate the setting of common positions vis-à-vis authorities of the host country, when necessary. Occasionally, distinguished speakers are invited to take the floor.

Interviews showed that collaboration with MS science counselors is the most fruitful in the common promotion of research programs. The joint visibility events promoted by SCs showcase both MS research programs and European FPs. In Brazil, China, India and Japan, a remarkable joint event is the organization of tours across the country showcasing the respective instruments of research collaboration.

Coordination, complementarity...

By construction, the European Union enacts a double level of political action, that of the MSs and that of the Union itself. Within this frame, research is an area of shared competence, and national research policies coexist with the Union's research policy. Our interviews shed additional light on two aspects of this two-level governance architecture : the coordination between national and EU S&T policies and SD strategies, and the complementarity of initiatives taken at each of these levels.

At the central level, coordinating national research and innovation policies is a task carried out in principle by the Strategic Forum for International Science and Technology Cooperation (SFIC), an advisory group to the Council, and the European Commission. Among the main tasks of the SFIC is networking of EU MS and Commission science counselors in key non-EU countries. At delegations, it is up to the SCs to carry out this networking and coordination task. Our findings emphasized this little-known role of coordination of initiatives with counterparts representing MSs – at least the few which have a dedicated science counselor in the field.

In our interviews, SCs unambiguously conveyed that their initiatives complement those of the MSs, each level of the Union's architecture bringing its own contribution. Through FPs, the Commission provides the main funding engine of the Union's research policy and of its external projection. Fuel is provided by scientific resources of MS research systems, combined with local resources of non-member countries. At their level, SCs aim to fulfill one of the major missions assigned by the Lisbon Treaty (article 180b): to carry out activities complementing those carried out by the MSs, namely, the "promotion of cooperation in the field of Union research, technological development and demonstration with third countries and international organizations". In interviews, SCs stated that these complementary roles are generally well perceived by local institutions and partners: "*we are viewed as complementary and there is a recognition of the EU's overarching coordinating and convening function*". However, the role of the EU's SC remains generally less well known than that of national counselors, and explaining to local interlocutors the added value brought in the field by the EU was said to be sometimes challenging.

... And competition?

The scope of actions carried out by SCs towards or with national science counselors, however, should not be overestimated. Our interviews highlighted that information exchanges and joint initiatives do not represent a high density of mutual relations. These actors meet and sometimes work together, but most of the time they work in parallel, raising the question of the compatibility between the respective agendas of the Commission and the MSs in the field. Our survey failed, this said, to identify areas where SCs would be in competition with or in opposition to MS science counselors: "*there is no active competition*"; "*[to] the contrary, all our actions are mutually reinforcing*"; MS "*pursue bilateral cooperation opportunities separately, but they tend to not be in opposition with our collective mandate*"; "*there is a general understanding of helping each other, since the EU STI policies and EU RTI program can also bring a benefit and complement MSs collaborations*"; "*generally, MS are happy to be represented under the EU banner*"; "*we have a good, cooperative relationship*". One of the SCs noted, however, that "*there is obviously more competition between MSs in initiatives where the innovation dimension of the research is prevalent and where promotion of opportunities for their own companies becomes the priority*". Another nuance concerns specific interests of MSs toward the host country – or the quality of their bilateral political relationship. National science counselors in some cases may show less motivation to cooperate, or exclude certain subjects from discussions with local authorities.

Previous research has emphasized the constructive joint work between actors in the field to promote national and European research programs, but also "revealed complaints about lacking willingness, or even resistance, to collaborate, strained

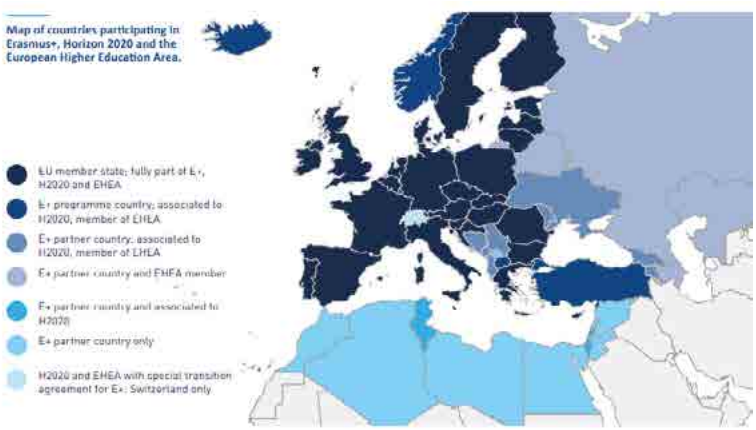
communications, and conflicts of interests between EU delegations and Member States' science counselors" (Rüffin, 2020). The same study also showed that strategies and interests of MSs and the European Commission do not necessarily align, which joins other observations already outlined in the literature (cf. Duquet, 2018). Elsewhere it is reported that "Member States' representatives (...) sometimes operate in competition to one another, and do not want to be coordinated or sounded out by EU delegation staff" (Flink & Rungius, 2018). The more resoundingly positive reports by our interviewees could suggest the existence of a social-desirability bias.

Are EU SCs like other science attachés? Are they science diplomats?

Interviews of our survey highlighted some similarities between national science attachés and EU SCs: "*our work is indeed comparable, they at national level and we at EU level*"; "*yes very similar, seeking cooperation in the areas of mutual interest, and giving visibility to that through other actions/policies and events*". Roles differ, however, in that SCs generally cannot link researchers of the host country directly with potential partners in Europe, as SCs have no S&T territory of reference of their own nor do they broker exclusive scientific resources. EU counselors also stressed the meager human and financial resources dedicated to S&T in delegations, as compared to those available at MS embassies. Another reported difference was that "*MSs counselors focus more on concrete scientific cooperation*" and are seen as "*rather technical*", while SCs' action, exemplified by their rallying role, would be more "*policy-related*".

In 2014-2019, the European Commission took center stage with policy papers and discourses on science diplomacy (cf. EC DG RTD, 2014-2019). Having in mind that science attachés at embassies are science diplomats par excellence and constitute one of the "institutionalized positions" identified in the recent literature (Melchor, 2020), it seemed interesting to ask SCs if they considered themselves so. However, our survey showed that not all SCs consider themselves as such, challenging this recent categorization. "*It depends on what is meant by science diplomat"; "no. I think scientists are the science diplomats"; "no. It is the role of the head of mission to do diplomacy"; "half yes, half no.... I am still treated as a local agent put in a different working condition. We don't have enough rights to be considered a representative.... However, when I work here, I try to think and work diplomatically"; "I consider myself a diplomat who is a scientist and works in the area of science*".

While they do recognize the term SD, and agreed that their field missions effectively implement SD for the EU, the SCs do not necessarily agree on its priorities or characteristics. None referred directly to the Commission's vision of SD as set out in recent years by Commissioner Carlos Moedas and the related strategic documents. Most appear to adhere to a classical view of SD as "*the use of international scientific collaborations to address common societal challenges and to build constructive and lasting international partnerships*", and "*a tool to keep possibilities open and dialogue ongoing*". The political nature of their work was apparent to all: "*from science, technology and innovation, we also explain what is the EU, what the EU is doing and which values the EU does represent*". In large countries whose relations with the European Union on certain issues are tense, SCs underlined the "*non-confrontational*" contribution of scientific cooperation, placing their work "*on the good side of the agenda*". However, the term "science diplomacy" was also viewed by some with skepticism. While "*scientific cooperation helps to maintain ties when countries do not get along well*", "*you have to do it without saying it. Calling it SD is diminishing its impact, as the label suggests a possible manipulation*". The notion for one SC "*evokes the instrumentalization of science. We must not politicize science*".



Countries participating in Erasmus+, Horizon 2020 and the European Higher Education Area.
Source: European University Association, @euatweets, 26 February 2018

Conclusions: Essential missions and policy benefits of EU science counselors... and remaining questions

Beyond the specificities of local contexts and of host countries' relationships with the EU, two essential cross-cutting missions of EU SCs emerged from this case study. First, a central mission is to promote and support the FPs, as flagship products and powerful tools of the international projection of the Union's research policy. Second, SCs are invested in the field with a mission of coordination: they organize the exchange of information with their counterparts representing MSs and seek to set up joint actions addressing institutions and potential partners in host countries.

From a policy perspective, we drew evidence of significant benefits that may be obtained by the EU from assigning S&T-dedicated agents to its diplomatic missions. SCs bring added value by supporting the international projection of the EU's research policy and the targeted outcomes in terms of influence. From their position in the field, SCs are able to understand the opportunity environment, feel the local atmosphere, and grasp unspoken content, which is so useful for informing headquarters' decisions. We also identified an important policy challenge deriving from the EU architecture. Depending on their size and their resources, MSs undoubtedly have different interests and needs in interacting on the ground with the EU SCs. Strengthening SC coordination with MSs science counselors could mirror, and likewise contribute to, the fine tuning desired by the EC between the S&T policy initiatives emanating respectively from the national levels and from the Union level.

Finally, we wondered about the fact that responses gathered in our survey did not identify areas where SCs would compete with or stand in opposition to MS science counselors. Observing the discrepancies between the declarations by our targets and some empirical results previously published in the literature, we suggested the existence of a social-desirability bias. The apparent discrepancy could also arise from our choice to turn first and foremost to the EU SCs in place. We supplemented the information gathered from these key witnesses by interviewing other Commission officials, present or past, but still staying within the "EU house". We asked EUs SCs to compare themselves to national personnel, but we did not ask national science counselors how they related to EU SCs, nor how they valued the latter's contribution in the field. Additional research could obtain such a 360° view and complete the insight gained from the EU network of SCs' self-assessment of activity, impact and effectiveness.

For diplomats

• EU SCs are well-perceived, but explaining to local interlocutors the value added by the EU beyond the MS representations is sometimes challenging.

• A little-known task of EU science counselors at field delegations is to network and coordinate with MS counterparts.

• Most of the time EU and MS SCs work in parallel. The former see such relationships as complementary, while research suggests that competition may be more keenly felt at MS level.

• Career diplomats whose awareness of science and research issues is limited in their initial training will have everything to gain from better understanding the role of EU SCs.

For scientists

• Most European SCs today have had academic training in natural sciences followed by research experience.

• Nonetheless, a background in natural sciences is not a prerequisite for becoming an EU SC: in a third of cases, the background of the current SC is in social sciences.

• Not all EU SCs consider themselves to be science diplomats, and they do not share a "house" view on science diplomacy.

• Of note: EU SCs can play a role as facilitators for host country researchers' participation in European research programs.

Overall

• SCs add value by supporting the international projection of EU research policy and reinforcing influence.

• SCs in the field understand the opportunity environment as well as unspoken content useful to decision making at headquarters.

• Strengthening the existing SC coordination with MS science counselors could achieve fine tuning between national and European S&T policy initiatives as desired by the EU.

Study Questions

• Are there aspects of public diplomacy in the work of EU SCs?

• If divergences were found between the interests and initiatives of science counselors of EU Member States and those of EU SCs, why would that be bothersome?

• How can one measure the effectiveness of the work of a science attaché? How can such an assessment be made in the case of EU SCs?

• How can one measure the effectiveness of the work of a science attaché? How can such an assessment be made in the case of EU SCs?

• Imagine a conversation between a newly posted EU SC and headquarters. Which priorities might be set for the SC's first actions? Would priorities diverge according to the actor? Which elements in the field might be considered most important by the SC or by headquarters? What would your advice be to the EU SC in regard to making contact with/involving MS science diplomats in the first months?

Endnotes

• A fuller version of this InsSciDE work will be forthcoming in a peer-reviewed journal. Ruffini PB (submitted) Science counselors of the European Union: A case study of science diplomacy.

• Cover image: The EEAS headquarters in Brussels.
Source: instagram.com/p/BCdbd1TR9Vu/

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European Technoscientific Diplomacy and the Fukushima Nuclear Emergency:

A Diplomatic Meltdown?

An InsSciDE Case Study

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The testimony of the Portuguese ambassador in Tokyo provides insight on how the European Union participated in the management of the Fukushima Daiichi nuclear accident in situ. The accident at the Fukushima nuclear power plant unfolded over time in the aftermath of the Great East Japan Earthquake of 11 March 2011 and the resulting deadly tsunami that severely affected Japan. We focus on the diplomatic reactions that took place during the first weeks after the nuclear disaster, i.e. when the water pumps of reactors 1, 2 and 3 stopped and the reactors began to overheat leading to meltdowns. The European Commission issued no guidelines for immediate field action, and indeed there was no common action across Member State embassies in Tokyo. Each country used its technoscientific expertise in a different and unique way. Portugal has never deployed science attachés; the official Japanese information was sent to Portugal to be analyzed by scientists, and recommendations were returned to the embassy daily. However, decisions on the ground were not primarily informed by such science-based input.

This case study calls for a discussion about the weaknesses and tensions in the European Union and the adjustments needed to be made to share technoscientific information during a diplomatic crisis.

Image credit: © OpenStreetMap contributors

Keywords:

Fukushima, nuclear disaster, crisis diplomacy, technoscientific information, diplomatic networks, Portuguese embassy

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European Technoscientific Diplomacy and the Fukushima Nuclear Emergency: A Diplomatic Meltdown?

This case study addresses the European Union's diplomatic response to the Fukushima Daiichi nuclear accident *in situ*. We use the testimony of the Portuguese ambassador in Tokyo as the primary source for this analysis. We explore the absence of a common EU response and the role of experts in the definition of diplomatic procedures facing a nuclear emergency in a third country.

The accident at the Fukushima nuclear power plant is, to loosely borrow from the historian Scott Knowles, a "slow disaster", in the sense that its consequences have continued to unfold long after the initial moment of the disaster itself.

In the face of a level 7 nuclear accident, the European Commission established an emergency team on the very same day of the accident, which remained active for three weeks; its response focused only on restricting Japanese imports into Europe.
No guidelines were issued for immediate action on the ground. Despite initial meetings among diplomats from the several countries of the European Union, there was no resulting common action. Each country thus used its technoscientific expertise in a different and unique way.

This case study calls for consideration of the weaknesses and tensions in the European Union that may need to be addressed to implement a common (technoscientific) diplomacy

The accident

On 11 March 2011, an earthquake measuring 8.9 on the Richter scale hit Japan.

Fifty minutes after the earthquake, the east coast of Japan's main island, which includes the Fukushima Daiichi plant, was hit by a powerful tsunami with 40.5 meter-high waves. Waves of 13 to 15 meters in height slammed into Fukushima I's 10 meter-high seawall. As a result, the plant's turbines were flooded and its emergency generators and coolant water pumps were deactivated.

While a second line of emergency pumps run by back-up batteries initially secured the continuous circulation of coolant water through the reactor cores as needed, these only lasted one day until 12 March when the batteries ran out of power.
As a result, the water pumps stopped and the reactors began to overheat, leading to meltdowns in reactors 1, 2, and 3. The accident at that time reached level 7 in the International Nuclear Event Scale (INES), a level of gravity matched only by the 1986 Chernobyl disaster.

Fukushima Daiichi before the accident. Photo Credit: Tokyo Electric Power Co., TEPCO
Wikipedia, © CC BY-SA 2.0

Fukushima Daiichi during the accident. Image credit: Digital Globe. Wikipedia, © CC BY-SA 2.0

The Portuguese ambassador in Tokyo

We recorded an interview with one of the *in situ* actors in the international diplomatic ecosystem present in Tokyo at the time of the great earthquake, tsunami and Fukushima disaster: Portuguese ambassador José de Freitas Ferraz. His narrative is relevant to understand his interpretation of the crisis, whereas to obtain a fuller historical vision of the events, other personal narratives and complementary documentation would need to be collected.

The analysis of the interview allows us to highlight the use of technoscientific expertise in designing diplomatic responses around the Fukushima accident. We asked the Portuguese ambassador in Tokyo to describe how EU countries initially responded to the Fukushima disaster during its first days:

- Was there a common response?

- Did EU ambassadors share information among themselves concerning both diplomatic action and scientific data and recommendations?

- How did diplomats perceive the role of scientific expertise?
    - Was it decisive or even important to inform their next steps?
    - Or was it a kind of bureaucratic information that was put aside?

Portuguese embassy in Tokyo. Image credit: Wikipedia, © CC BY-SA 4.0

EU ambassadors

Apart from the Portuguese ambassador himself, several other protagonists who intervened scientifically and diplomatically, both individually and institutionally, are mentioned during the interview: (i) the ambassadors of various European countries, such as Italy, France, Germany, Sweden, and Spain; (ii) the ambassador of the United States of America, who had access to far more resources than the European ones, thus becoming an important diplomatic anchor following the accident and during the ensuing crisis; (iii) the ambassadors of former Portuguese colonies in Africa, i.e. the so-called PALOPs (African Portuguese speaking countries), and Brazil.

The official European delegates, whose role was mainly to strengthen the link with Brussels, are also protagonists, albeit less visible ones.

Science attachés

Science attachés also played active roles in finding solutions and designing actions to deal with the accident. For example, countries that had scientific advisors in Tokyo, such as Italy and Germany, were able to intervene faster in the initial phase of the accident. This early intervention supported immediate individual decisions by their countries' citizens. However, as the situation became more complex, the advisors instead followed more centralized decision-making processes that relied on guidelines and instructions received from their respective countries.

By contrast, Portugal had no scientific advisors working in the embassy (only a cultural attaché); scientific information necessary to guide diplomatic decisions was thus provided remotely via the Institute of Nuclear Physics in Lisbon. This circuit was obviously more time consuming. The delayed return of the remote assessment could limit the efficiency and scientifically informed dimension of on-the-ground responses led by the Portuguese ambassador. In fact, the ambassador found that the official information made available by the Japanese government was most relevant in making his decisions and informing the Portuguese community in Tokyo (for example providing advice to Portuguese citizens on protective measures such as sheltering, sourcing food, leaving the country, etc.). The scientific dimension of Portuguese diplomatic decisions in the context of the nuclear accident was faintly felt and was not perceived by the embassy as critical to decision-making processes.

A scattered European technoscientific diplomacy and the role of multiple networks

The factual narrative of diplomatic experience in the several days of crisis starting on 11 March 2011 suggests that the EU Member States acted as a set of independent countries incapable of deploying a common action and a shared response.
The Portuguese ambassador suggested that scientific information that was crucial in the aftermath of the nuclear disaster did not run mainly through institutions but through personal networks among diplomats, similarly to the case of general diplomacy.

The ambassador strongly emphasized that during the Fukushima disaster, diplomacy took place mostly on a "personal basis", with individual actors using their own channels to pursue scientific and diplomatic initiatives.

Networks

Institutional networks were often reinforced by personal networks. In instances in which institutional networks were fragile, personal networks would take precedence. While embassies had an undeniable institutional power, it was the ambassadors' individual strategies and their networks which spearheaded quick responses in times of crisis and communication breakdown.

While the ambassador did recognize that there were initial meetings between diplomats from the various EU countries, he was adamant that there was no common action and each country used its own technoscientific resources regarding nuclear issues in a different way.

Additionally, countries with science attachés did not make their resources available to other EU members; that is, there appeared to be no policy of sharing human and/or technoscientific resources.

However, while there were no efforts to build a common resource database to be used by all EU diplomats, they shared their own technoscientific resources with specific networks of influence. This suggests that technoscientific resources were used as national diplomatic tools, creating niches of influence that went beyond EU frontiers and used common languages as their main support (for instance, Portugal, African Portuguese-speaking countries, and Brazil).

Technoscientific expertise and diplomatic action

Technoscientific expertise was in principle of high relevance given the context of the Fukushima disaster. But was it perceived as critical information to design diplomatic action?
All embassies dealt with the daily Japanese technoscientific information as well as with their own national scientific resources, both by using their science attachés or by interacting with national institutions.

Portugal did not have any science attachés in Tokyo and thus fell into the latter case. The Portuguese ambassador sent official Japanese information to Portugal on a daily basis. After analysis by scientists from the Nuclear Technological Institute in Lisbon, recommendations were then sent back by the Portuguese government to the ambassador in Tokyo.

According to the Portuguese ambassador, technoscientific expertise and information were not commonly used by diplomats to decide which diplomatic measures should be taken, even in situations in which technoscientific knowledge might be perceived as crucial.

He reflected that diplomatic duties during the crisis situation were so demanding that little time remained to pay much attention to the data sent by Lisbon-based nuclear experts. Therefore, pressed for time and without specific expertise, he found that he scarcely used technoscientific data when deciding which diplomatic actions to take.

The EU common technoscientific diplomacy: A meltdown?

The Fukushima accident is an interesting case study to analyze technoscientific diplomacy in the making, as it presents a crisis scenario during which diplomats were requested to make decisions on the spot, with scant time to ponder solutions and probably without being able to consult their governments.
This case study unveils certain weaknesses or deficits of communication among EU embassies and the need for adjustments to develop an effective common technoscientific diplomacy.

The diplomatic networking culture that might exist among EU countries was easily bypassed by alternative networks, based on personal relationships, common historical pasts, and common language. For instance, the network of Portuguese-speaking diplomats from Brazil and African countries took precedence over EU networks, undoubtedly due to ease of communication built on a common language rooted in a historical past.

Nonetheless it is critical to be aware that even where there are commonalities, there are also different cultures of science diplomacy that must be considered in order to safeguard the diversity of diplomatic practices and choices.

Conclusions: What are the lessons for European technoscientific diplomacy?

Although the concept of technoscientific diplomacy is a strong pillar of contemporary official governmental policies, it seems that there is a considerable gap between the policy-making realm and the daily practice of diplomats.

We deem it necessary to dig deeper into the personal narratives of practitioners in order to fully grasp the scope of obstacles that prevents (i) a common EU diplomatic action or (ii) the actual use of technoscientific expertise as a tool for diplomats.

We believe that a change in the current "diplomatic culture" is needed in order for diplomats to consider technoscientific expertise and data as part of their diplomatic tool kit.

Fukushima Daiichi nuclear power plant on 20 March 2011. Aerial photo taken by a small unmanned drone. From left: Unit 1, partially seen; Unit 2, Unit 3 and Unit 4. Image credit: Air Photo Service Co. Ltd., Japan.

Study Questions

• How can dialogue be fostered between diplomats and experts?

• How relevant is technoscientific literacy to diplomats?

• How can an effective EU diplomatic network be built for sharing technoscientific information through human resources and databases?

• In a crisis situation with a strong technoscientific outline, should ambassadors request extra support from national and EU experts? And if so, should these be available on a European basis?

Endnotes

• Based on an unpublished interview by Maria Paula Diogo, Ana Simões and Paula Urze with the Portuguese ambassador in Japan, José de Freitas Ferraz, at the Instituto Diplomático, Lisbon, 17 June 2019.

• Cover image: Location of Ōkuma, Fukushima (town in the vicinity of Fukushima Daiichi plant, evacuated at the time of the nuclear accident). Wikimedia, ODbL, ©CC BY-SA 4.0 and ©OpenStreetMap contributors.

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Heritage

Legacy and Perspectives of Archaeology in the Near East

Alexander Pruß (JGU) and case study authors

InsSciDE's work package "Heritage: The past as a challenge to build up a future?" focuses on the history of archaeological research in the Near East and the challenges resulting from the research on, the preservation, and the management of archaeological heritage in that region. Heritage has increasingly become a political and diplomatic issue in the last twenty years, especially in the Near East. In our case studies we sought to map the historical and contemporary actor constellations in the conduct of archaeological research and heritage protection in the Near East, and the lessons to be learned from its transition from colonial exploitation to cooperative partnership.

The beginning of archaeological research in the Near East in the 19th century was deeply rooted in the imperial designs of European national states, which competed for prestigious sites and spectacular finds with their European neighbors. Results were presented in Europe in European languages for a western audience. Many early excavators had actually been appointed diplomats (e.g. Botta at Khorsabad) and other missions (e.g. Carchemish) were used for intelligence gathering. This legacy still has an impact on the present-day archaeological work in the region and its perception in both Europe and the Near East.

One of the case studies (Butterlin) examines the Mari excavations (1933–2010), tracing an evolution from imperial designs by France in the Levant, to a model European and international cooperation. Mari is one of the best-investigated urban sites of Near Eastern antiquity, occupied during the 3rd and 2nd millennium BCE. Originally initiated with typically imperialistic views on the role and function of archaeology, the Mari mission of the early 21st century was transformed into a multilateral operation supported by the French Ministry of Foreign Affairs and today involving institutions from seven European countries in partnership with Syrian institutions. Another case study (Helms and Pruß) deals with the 1958–1976 excavations at the site of Tell Chuera, another important urban center of the 3rd millennium BCE, conducted by a German team. The diaries of the team members allow a closer look at their attitude towards local authorities, the local workforce and the other team members. It is evident that conduct during the missions followed patterns developed in the colonial era, even long after the end of direct European rule.

Even as the application of modern antiquity laws in the Near East since the 1930s effectively ended the legal transfer of archaeological heritage objects out of the region, knowledge on the region's past is still unevenly spread with most important excavation archives situated in western countries. The Digi Mari case study (forthcoming by Butterlin in a special issue of Syria: Art, Archaeologie et Histoire) built up a new multi-stakeholder way of sharing data, ensuring that the actual excavation documents are broadly accessible and integrated in the assessment of wartime damages and also the rebuilding process.

The wanton destruction of several archaeological sites and museums by Daesh has alarmed a worldwide audience to the perils faced by archaeological heritage. The Khorsabad case study (Butterlin) focuses on a site which was for a short time in the 8th century BCE capital of the Assyrian Empire, where excavations were conducted in the 19th century and the 1930s, and which became a site of short but heavy combat in October 2016. One aspect of the case is the Citadel project of war damages assessment, relying on drone images acquired already during the Daesh occupation. This assessment has been completed by more precise field operations once the site became accessible, producing 3D modeling and interpretation. These data provide the basis for future fieldwork projects on the site, which are scheduled for the coming years. The Citadel project, stimulated and supported by InsSciDE, is an answer to actual demands, providing an ideal interface of technological transfer and training for local site management, including scientific research and patrimonial management. InsSciDE's involvement was thus part of an effective science diplomacy, in which practitioners interact to preserve heritage and enable international scientific development.

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

The French Archaeological Mission in Mari:

From Colonial Venture to French Science Diplomacy in Syria (1933-1974)

An InsSciDE Case Study

Pascal Butterlin
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One of the legendary cities of Ancient Mesopotamia, Mari was a seat of major power for centuries in the third and second millennia before our era. The Mission archéologique française à Mari was formed in 1934 following an exceptional set of discoveries on the site of Tell Hariri. Over the course of 75 years, 47 excavation seasons were organized by various French institutions. Three generations of archaeologists have worked on the Mari site in this marginal region of Syria, near the border with Iraq, in greatly varying (geo)political and practical contexts. The evolution of the archaeological project, especially from 1933 to 1974, offers a striking example of how Near Eastern archaeology was transformed from a typical imperial "adventure", widely celebrated by the media, into a heritage management project, based upon a fruitful collaboration between Syrian institutions and an increasingly internationalized team, still under French leadership, with the active support of the French ministry of foreign affairs. The case study recounts this story, offering a glimpse of how science diplomacy can be said both to shape and result from this gradual transformation.

Image credit: Parrot Archives

Keywords:

Mari, Mesopotamia, Syria, Parrot, Near Eastern archaeology

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The French Archaeological Mission in Mari:
From Colonial Venture to French Science Diplomacy in Syria (1933-1974)

Mari, one of the legendary cities of Ancient Mesopotamia, was the seat of a major power at the time of the city-states of Sumer and Akkad. The French archaeological expedition in Mari (known as MAM for Mission archéologique française à Mari) was initiated in 1934 following an exceptional set of discoveries on the site of Tell Hariri. Over the course of 75 years, 47 excavation seasons were organized by various French institutions. Three generations of archaeologists have excavated there in greatly differing (geo)political and practical contexts, in a marginal region of Syria, near the border with Iraq. This archaeological project offers a unique view on how science diplomacy, although remaining unnamed as such, could both influence and result from the transformation of an imperial mission into a multilateral cooperative heritage project.

The Mari archaeological project began under the French mandate in Syria, with the support of the army of the Levant and in cooperation with the recently established antiquities department based in Beirut. Over time, French institutions of note involved in the project before the Second World War would include the Louvre Museum and the ministry of education, and thereafter the French ministry of foreign affairs with the support of the Louvre, France's national research network CNRS and various universities, particularly the University of Strasburg, and later Versailles and Paris I.

André Parrot, director of the excavation from 1933 to 1974, worked first in the French mandate and after World War II in the young Syrian Arab republic. His emblematic French archaeological mission managed to function in a progressively unstable environment thanks to a powerful network both in France and Syria. This network allowed the excavations to resume in 1952 and again, from 1960 to 1966, and 1969 to 1974, with various international crises in the region interrupting the project in 1956, 1967, and 1973. Starting in 1979, Jean-Claude Margueron took over the project, which functioned continuously from 1979 to 2004, in spite of tensions between France and Syria during the Lebanon war (1975-1989) and the Gulf wars (1990 and 2003). From 2004 on, author Pascal Butterlin pursued the work as war raged in Iraq and the Syrian-Iraqi border was occupied by US forces fighting various insurgents in the Al Anbar province.

The evolution of this archaeological project, especially from 1933 to 1974, offers an example of the way in which Near Eastern archaeology was transformed from a typical imperial "adventure", widely celebrated by the media, into a heritage management project, based upon a fruitful collaboration between Syrian institutions and an increasingly internationalized team, still under French leadership, with the active support of the French foreign ministry. In October 2010, the French ambassador to Syria and the governor of the Der es Zor province inaugurated a visitors center on the site itself, funded by Total Syria, who was by then the main sponsor of the project.

André Parrot (1901-1980)

Son of a pastor from the Pays de Montbéliard, André Parrot studied theology at the Sorbonne and at the Protestant theological faculty of Paris, obtaining a doctorate. He was a pastor of the Evangelical Lutheran Church of France. In 1926-27, he became a member of the biblical and archaeological school active in Jerusalem and began excavating in Neirab and Baalbeck, Lebanon, before going to Iraq until 1933. From 1933 on he directed the Mari excavation for 21 seasons until 1974. Employed by the Louvre as of 1937, he became head curator of Near Eastern Antiquities in 1946, and general director of the museum in 1968 until his retirement in 1972.

Parrot in his office in the expedition house at Mari, with statues from the 8th campaign, 1953. Credit: Parrot Archives n° 15065; see archeologie.culture.fr/fr/a-propos/andre-parrot

The stakes in the 1930s

The site of Tell Hariri Mari is situated in Syria on the right bank of the Euphrates, near the town of Abu Kemal. The border between Iraq and Syria was established there following the Sykes Picot convention of 1916. At the beginning of the 1930s, Abu Kemal was a small outpost, created by Ottoman rulers in order to control the Bedouin tribes and the roads to Baghdad along the Euphrates River. The route itself remained marginal since the Euphrates was unsuitable for navigation by steamer. At the time of the discovery of the site, the main access to the site was via either the road from Aleppo or the desert road running along the recently opened pipeline linking the oil fields of Iraq to the Syrian coast.

Bedouins digging a grave in the mound discovered a statue of ancient Sumerian craftsmanship. Informed by the military authorities at Abu Kemal, the French authorities dispatched André Parrot who was just coming back from his excavation at Larsa, Iraq. The entire staff of French missions converged from various places in the Middle East upon the site. This was quickly identified as a city mentioned in the royal lists of the ancient Sumerians: Mari, one of the last great capitals of Mesopotamia not yet identified in the field. This identification was in itself a major discovery, not least because it was unexpected to find it so far from the heartland of such cities in Iraq. The site rapidly became a major archaeological priority, as Parrot's team (of five European specialists assisted by local workers) uncovered an extraordinary number of objects and inscriptions, a major palace, and more than 20,000 cuneiform tablets: the royal archives of Mari. Mari became one of the most prolific sites of the region, giving a historical background to the young Syrian state. As national identity was constructed and heritage institutions, notably national museums, were built up, Mari furnished an inestimable set of objects, displayed partly in the National museum of Aleppo, and partly in the Louvre.

The excavation was conducted under a concession delivered to the chief of mission A. Parrot and the Louvre Museum as overseer. Under the recently formulated law of antiquities, ownership of the discoveries was split between the Louvre and the authorities of the mandate represented by a director general. This practice, adopted in the French and British mandate in Syria, in Lebanon, and in Iraq (up to 1933) was in fact a return to past practices: common in the 19th century it had been abolished by Ottoman rule in 1906. The sharing of the

The excavation esplanade, 1937. Credit: Parrot Archives n° 4662.

antiquities was a much-debated issue, and in the case of Mari involved complex negotiations, especially over the finest pieces which could be put aside if considered national treasures by the authorities.

The mission functioned as a complex French foreign operation. All apparatus, including scientific material such as the photographic equipment provided by the Lumiere Brothers, or rails and wagons used to evacuate spoil from the dig, came from France by boat and was driven inland from the port of Beirut. An excavation house was built onsite in 1935. From 1933 to 1938, the French army provided supplies and gasoline to the mission from its own inventory, and the French military aviation provided aerial photographs of the excavation.

The excavation took place once a year, usually from late December to March of the next year. During those three months Parrot, with the assistance of five to six staff members, directed more than 300 workers recruited among the local tribe and exclusively from the village of Seyyal. Parrot himself was in charge of the entire operation, keeping short entries in a diary of events and progress. The excavation was like a factory operating six days a week from sunrise on. The workers loosened and transferred soil for eight hours, exposing mud brick architectural structures and sifting through the spoil for objects. The day continued then for the technical staff, architects in charge of the plans, a photographer, and in rare cases a cinema operator. Following the standards of foreign expeditions in the Middle East, these specialists created an archive comprising diaries, photographs, drawings and plans of the excavated ancient buildings. Apart from the scientific records, photographers documented scenes from local life, captured usually on vacation days but also during trips: these pictures provide a vivid but completely orientalist (imperialist and romanticized) vision of colonial Syria.

In the field up to the 70s, Gustave Tellier was in charge of the excavation itself, the training of the workers and the management of the excavation teams. Workers were paid directly by the director of the mission, and a ritual was progressively instituted, which was still in place in 2010. Workers were

A French air force plane over the Ishtar Temple, March 1934. Credit: Parrot Archives n° 1001.

"In front of the expedition house", 1938. Credit: Parrot Archives n° 15006.

organized according to the kind of work they performed and the tools they used, following a management system created before the First World War by German archaeologists in Iraq especially at Ashur. They had trained specialized workers known as shergati (people from Qalat Shergat, the modern name of Ashur) to constitute an elite crew of brick excavation technicians. The first step of the Mari excavation was to train a generation of local workers to master this special technique.

Among the specialized staff of the excavation was an Assyriologist in charge of reading the cuneiform inscriptions, in particular the thousands of tablets unearthed by Parrot. Georges Dossin, from Liege University, was appointed as the epigraphist of the French mission, which was therefore from its beginning a European endeavor linking French archeologists and scholars from Liege, as it still is. Dossin (like his good friend Agatha Christie, Lady Mallowan) documented expeditionary life with still and moving photography. He filmed the Mari excavation, producing rare documents showing the British or French excavations in the Middle East during the 30s and later on in the 50s.

Georges Dossin (1896 - 1983)

Georges Dossin studied in Liège and Paris and obtained doctorates in classical philology (1921) and history and oriental literature (1923). He was professor of art history of Asia Minor in Brussels and Liège. From 1935 to 1941 at the Free University of Brussels he taught a course on the extinct language Akkad, which is written in cuneiform; its two dialects, Assyrian and Babylonian, were widely used from about 3500 BCE. From 1951 to 1966, he taught Assyriology and grammar comparison of Semitic languages at the University of Liège. Dossin is famous for the publication of the Mari texts, for which he coordinated the Belgian and French colleagues.

At the end of the excavation season, the complete inventory of objects was presented and the sharing ritual took place. The first time such an operation occurred, it was Henry Seyrig, a paramount figure of French archaeology in Syria, and head at that time of the high commission antiquities department, who represented the local authorities. Parrot recounts that the negotiation was indeed difficult, with Seyrig stoutly defending the interests of the local authorities. When agreement was found the discoveries were transported respectively to Aleppo or to France (arriving by boat in Marseilles to then be carried to Paris). Each step of the process was carefully recorded and is preserved in the archives of the archaeological mission and at the Louvre Museum.

Georges Dossin and André Parrot in Mari, 1951. Credit: Parrot Archives n° 15025.

Resuming work in Mari, in post-colonial Syria: Shifts in actors and in practices

Parrot left Syria in 1938, and due to war couldn't return until 1951: meanwhile Syria had achieved independence in 1946. In the case of archaeology, independence meant the development of new institutions, notably the directorate general of antiquities and museums (DGAM) in Damascus. A new code was adopted regulating activities around antiquities; foreign archaeological missions were still possible but the discovered objects were to remain in Syria. In the case of Mari, the main problem of the time was security along the Euphrates: with the war and the successive confrontations in Syria, this remote region remained

Visit of General Chichakly to Mari, January 1952. Credit: Parrot Archives 15007.

poorly controlled. Parrot has vividly narrated how, in spite of the situation, he was able to resume work in Mari, in a completely different world.

From the mid-30s a discussion grew in France about the way archaeological missions abroad were financed and organized. The Mari mission, like other missions, was financed by the ministry of public education, on behalf of a specific East Asia commission. Parrot wrote letters in 1937 asking for the involvement of the ministry of foreign affairs. In 1947, that ministry created an excavations commission, with a subcommittee devoted to the "Ancient East". From then on, the mission would be financed by this commission, of which Parrot became secretary general in 1958.

With this support, Parrot went to Damascus, met the French ambassador who supported his project, and transmitted his request to meet the Syrian authorities, although he remained skeptical about the possibility of resuming work in the Euphrates region. But almost miraculously, the new chief of staff in Syria was Lieutenant-Colonel Chichakly, former officer in the mandate army, who had been posted in Abu Kemal before the war, and had become a friend of Parrot. Chichakly, who would soon become president of Syria after launching a coup, gave full support to Parrot and accelerated the process of responding to his requests.

Excavations resumed in Mari in 1952, 13 years after the last campaign. Chichakly himself came to Mari in 1952, and his visit, the only visit of a Syrian president to the site, is well documented in the archives of the mission.

The Mari expedition was still in the hands of Parrot and Tellier, who came on excavations until 1972. New generations of scientists and collaborators came to the site, along with Parrot's new wife, responsible for photography from 1955 on. The shift of generations in the 50s and 60s is perceptible through the archives.

This shift materialized in several ways. Archaeological techniques evolved quickly during that time, with carbon-14 dating being done in Mari already at the beginning of the 60s. The documentation became much more substantial with a general upgrade of the survey techniques. This particular shift sparked many debates and in one case, in 1960, a real conflict between Parrot and his team in regard to formulating scientific policy.

Among the shifts, collaboration with Syrian colleagues was developed: a representative of the DGAM now regularly came to the site. An active partnership allowed the restoration of the exceptional statues discovered in the 50s: they were reassembled and transferred to the national museum of Damascus. With Georges Dossin, and later M. Birot, the program of publication of the Mari texts continued; once documented and presented in dossiers, the tablets were sent back to Syria.

Seventh campaign of the Mari archaeological mission; the team on 5 January 1952. Credit: Parrot Archives n° 4453.

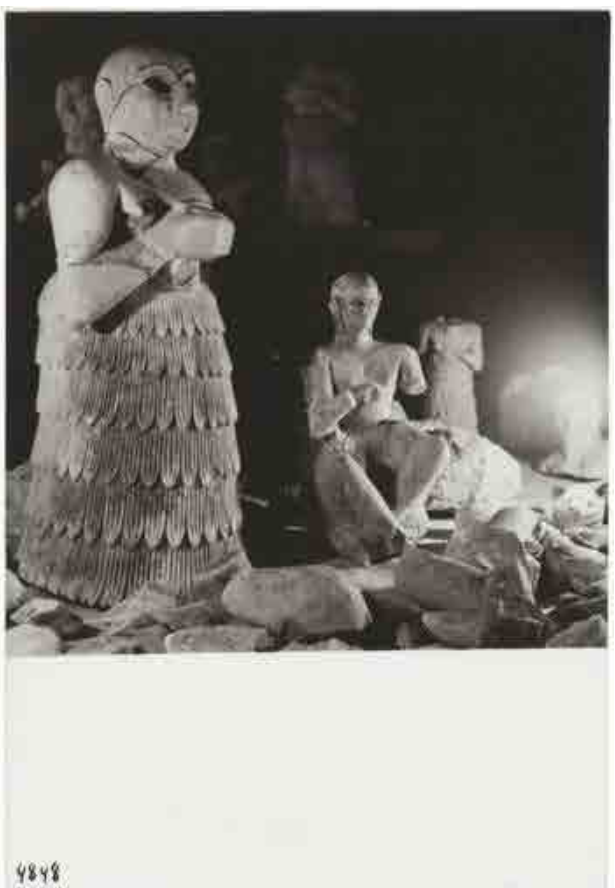
Parrot, who became a head curator at the Louvre and its first general director in 1968 with the support of his friend André Malraux (Charles de Gaulle's minister of cultural affairs), was at the center of an active web of communication. He was a pastor and a teacher, and made speaking tours at which his audience, notably in the protestant parishes of France and abroad, was particularly interested in the light shed by Mari documentation on biblical history. This interest, well developed in France, helps to explain the active support provided to archaeological expeditions working in the Middle East, whose researchers were linked to religious missions, catholic or protestants, or more secular ones.

The Mari documentation played a crucial role too in the formalization of a national identity. Mari and another major site, Ebla (excavated from the end of the 60s), were seen now at national level as the first great cities of what would become Syria. Uncovering the tablets, inscriptions, monumental art and royal urban structures made it possible to write the first pages of the history of an original civilization, different from Egypt or Sumer. The interpretation of the cuneiform texts became a contentious political issue, more in the case of Ebla than Mari, because those texts also mentioned tribes possibly linked to the Hebrews. In this part of the world, in the context of the Arab-Israeli conflict, archaeology was instrumentalized by politicians in support of territorial claims bearing on both Great Israel and Great Syria.

With the support of André Malraux, Parrot could organize international exhibits for which the objects discovered in Mari and conserved at the national museum in Damascus travelled to France. It was the beginning of an active science diplomacy through museums, loans and exhibitions. It became common practice in the 60s and 70s and was part of an active policy promoting Syria as a destination for cultural tourism.

Interrupted by the Suez crisis and its diplomatic consequences, namely the breakdown of diplomatic relations between France and the United Arab Republic, the mission resumed its activities in 1960 and benefited from the Arab policy of de Gaulle. Parrot has narrated how in the very unstable Syria of the 60s, the mission was able to continue in spite of repeated coups: it was not in the field, far away from the great cities, that tensions were felt but once the expedition went back to the cities, notably Aleppo.

When Parrot had returned to Mari in 1950, he had discovered a site in ruin: the extraordinary palace excavated in the 30s had not resisted the Syrian climate and its enormous mudbrick walls were crumbling. In the 1960s major heritage projects were developed with UNESCO, but Mari was not a priority. It was only much later that mudbrick architecture came to be considered as relevant for protection as stone architecture. Parrot initiated a project to conserve the newly discovered third millennium palace, known as the enceinte sacrée (sacred enclosure). With walls still standing up to 5 meters high, it was absolutely exceptional. A protective roof was installed upon the walls of the palace in 1974, the first step of a conservation program carried out with the support of the French association of friends of Mari for the safeguard of the site. The roof succeeded in shielding the building until the 90s and Mari became a touristic site, part of the grand tour of Syria.



Statues of the Inanna temple, 1953. Credit: Parrot Archives n° 4848.

Study Questions

• Consider the major milestones or turning points experienced at Mari. Are these political, diplomatic, historical, scientific, technical, transnational, cultural, ethical, practical? Which appear significant to you in order to discuss this case as revealing of "science diplomacy"?

• Which historical practices at Mari form a positive foundation for state-local-archaeological partnerships today? Which may call for debate and the construction of different understandings? Who can act as science diplomats today, and what roles should they play?

Endnotes

• The InsSciDE work on Heritage will be exhaustively presented in a peer-reviewed special issue of Syria: Archéologie, Art et Histoire, 2023.

• Cover image: Uncovering the statue of King Ishtup El (reign c. 2147–2136 BCE), March 1936. Credit: Parrot Archives.

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The Workers' Strike of 1963 at Tell Chuera:

Persistence of Colonial Practices in Near Eastern Archaeology?

An InsSciDE Case Study

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A team of archaeologists from Berlin under the direction of Prof. Anton Moortgat conducted, starting from 1958, excavations at the important ancient urban site of Tell Chuera in northeast Syria. The heterogeneous composition of the Syrian workforce contributed to frequent quarrels and conflicts. In October 1963, one of these conflicts escalated into a 5-day strike, during which the workers also demanded higher wages. After the involvement of local police by the archaeologists, the strike was ended with the threat of brutal punishment. The actions of the German team exposed the persistence of colonial attitudes among them and their lack of knowledge of the society of their host country.

This continuation of highly asymmetric power relations between western researchers and Near Eastern societies even long after the end of the imperial period highlights the necessity to develop an archaeological practice of true partnership for the future.

Image credit: Moortgat Archive Project

Keywords:

Near Eastern archaeology, Syria, post-colonialism, power relations

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The Workers' Strike of 1963 at Tell Chuera:
Persistence of Colonial Practices in Near Eastern Archaeology?

At Tell Chuera in northeast Syria during the German archaeological excavation campaign of 1963, a quarrel between different groups of workmen and the demand for higher wages escalated into a strike involving nearly all workers. The archaeologists did not seek to negotiate or even talk with the leaders of the strike, but alerted the police stationed in a nearby village instead. Police intervention led to the arrest of the leaders which finally brought the end of the strike. While the event itself was of minor importance for those involved and had apparently no serious lasting consequences even for the ringleaders of the strike, it illustrates the persistence among the archaeologists at that time of attitudes deeply rooted in the colonial era and their total unawareness of the problematic nature of such attitudes.

Archaeological excavations in the Near East commenced in the 1840s as a part of the imperial designs of France and Great Britain in territories then ruled by the Ottoman Empire. In the years leading up to the First World War, other European states and the USA became involved in archaeological missions, and the academic disciplines of Near Eastern archaeology and Assyriology developed. With the creation of French and British Mandates (Palestine, Syria, Iraq) in 1919/20, large parts of the region came under direct European rule which ended with the independence of Arab states and Israel between 1932 (Iraq) and 1948 (Israel/Palestine).

After the Second World War, German archaeologists, who had conducted many excavations in the region before 1914, reappeared in the field only starting from the mid-1950s. Among them was Anton Moortgat, at this time holding Germany's only professorship in Near Eastern Archaeology (at University of Berlin). He started an excavation project at the large site of Tell Chuera, which consists of the remains of a major urban settlement of the 3rd millennium BCE.

While Moortgat maintained friendly relations with the Syrian Directorate General of Antiquities and Museums (DGAM) at Damascus and with the director of the Aleppo Museum, his relation with the local inhabitants was restricted to the hiring and management of local workers. Neither he or any member of the small German team (5 or 6 persons) was able to speak Arabic and so nearly all communication with the workers was made possible by either the Syrian foremen or by the representative of the DGAM.

Worship statuettes found at Tell Chuera during early Moortgat expeditions, displayed at the National Museum of Damascus. Source: ArcheOrient Blog, archeorient.hypotheses.org/15787

Anton Moortgat (1897–1977)

Anton Moortgat was born in Antwerp, Belgium into a well-known upper middle-class family. He started his studies of classics at Ghent, but had to leave Belgium with his father in 1918 and relocated to Germany. He continued his studies at Münster and Berlin and finished his Ph.D. in classical archaeology in 1923. At Berlin, he came in contact with Max von Oppenheim, who had directed excavations at Tell Halaf in Upper Mesopotamia (since 1920 in North-East Syria) and worked as assistant in Oppenheim's research institute. In 1929 he moved to the Museum for Near Eastern Antiquities in Berlin and was appointed as honorary professor at the Friedrich-Wilhelms University of Berlin in 1941. After the war, this university was situated in the Soviet sector of Berlin. Moortgat, together with several colleagues, left in 1948 and was appointed ordinary professor for Near Eastern archaeology (the only such professorship in Germany until 1963) at the newly founded Free University in West Berlin. He remained in this post until his retirement in 1967. He had a lasting influence on the development of Near Eastern archaeology in Germany, as many of his students held professorships themselves.

Following the example of Oppenheim, Moortgat chose an excavation site in North-Eastern Syria, the large urban settlement of Tell Chuera, where he directed eight seasons of excavations between 1958 and 1976. He and his team made impressive finds there. However, the understanding of the excavation results was limited by his ignorance of up-to-date excavation methods and his focus on a few exceptional finds instead of the development of the site as a whole.

Like most of his contemporary colleagues, Moortgat made no attempt to learn more than a few single words of Arabic. For real communication with the workmen, he and his team were dependent on middlemen, such as the foremen or the representative of the Syrian antiquities service.

Source: Archive of the Max Freiherr von Oppenheim Foundation

Stakes 1: The impact of diplomatic relations on archaeological excavations

During the French Mandate period (1920–1944/46) the French administration of Syria granted an excavation permit for a large area in North-Eastern Syria to the Oppenheim Foundation. After Syria became independent, the permit was renewed. Anton Moortgat used this permit when he directed excavation campaigns in Syria. However, the political implications of the Mideast conflict affected the feasibility of actual field work. After the first meeting of the political leaders of Israel and West Germany in 1960, Syrian authorities prevented the scheduled excavation campaigns of 1961 and 1962. When West Germany and Israel started full diplomatic relations in 1965, Syria (together with other Arab states) terminated its diplomatic relations with West Germany and German archaeologists were banned from entering Syria. Moortgat had to wait until 1973 before another campaign became possible.

The granting (or refusal) of excavation permits has been used as incentive (or leverage) in bilateral diplomatic relations in several instances. For example, in 2011 Turkey announced that all excavation permits held by German archaeologists could be declared void if the Museum of the Ancient Near East at Berlin would not hand over a colossal restored sphinx statue that once adorned a gate of the Hittite capital Hattusha situated in central Turkey. The legal status of the object was disputed and neither side could prove its claims. After negotiations involving high-ranking diplomats from the Ministries of Foreign Affairs of both Germany and Turkey, the sphinx was eventually restored to Turkey.

As Near Eastern archaeology is dealing with a region of political tensions and quickly changing levels of security, archaeologists active in the region regularly have to cope with planning uncertainties and security concerns. This is not a new phenomenon and affected researchers at all times in the last 180 years. Despite the dangerous image of the region, no western archaeologist was severely attacked or killed in the region in the last decades. However, several local archaeologists were killed by the Islamic State, most prominently Khaled al-As'ad, director of the Archaeological Museum at Palmyra.

The Tetrapylon of Palmyra on a Syrian 100 pound note. Photo credit: onlinelibrary.wiley.com/doi/epdf/10.1111/2041-5370.12101

Stakes 2: Whose cultural heritage?

The first excavators in the Near East came to the region in the 1840s as diplomats, representing France and Great Britain. They had neither proper diplomatic training nor any archaeological expertise. Apart from the evident imperial designs in which their endeavors were embedded, their interest was twofold: they intended to find material evidence for events and empires mentioned in the biblical and classical traditions, and provide the national museums at home with spectacular finds which would boost national prestige. Other countries (Germany, the USA and others) joined this competition for national prestige later. Until deep into the 20th century, the acquisition of archaeological finds for western museums remained one of the most relevant reasons to sponsor archaeological research in the region. Both the museums and the academic institutions in the western world dealing with the finds understood their role as custodians of all civilizations of the past. It was only natural, in their view, that the treasures of these civilizations were kept in the capitals of the most civilized nations on earth in the west.

The meaning of these objects for the societies of the countries where they were excavated was for a long time largely ignored in the west. When the Near Eastern states developed antiquity laws (starting with the Ottoman Empire in 1883; the Arab states followed until the 1930s) which declared all archaeological finds as property principally of the state where they were found, archaeological finds started to remain in newly opened museums in the region. But even in the states of the Middle East the material remains of the past (mobile objects as well as immobile sites and ruins) were mainly considered as a touristic resource rather than national heritage.

Until the Second World War, cultural heritage was viewed as a concern of the different nation states. The Hague convention of 1954 stated for the first time the universal importance of cultural property. This was the base for the UNESCO World Heritage Convention of 1972 which built a framework to define cultural heritage of global significance. While in the first years the list of World Heritage Sites contained mainly European and North American sites, it became a truly global account as of the 1990s. The popularity of the World Heritage Sites brand raised the awareness of the importance of archaeological finds for the cultural memory of peoples.

References to the glorious past of the region became part of the national identity of many Near Eastern states and were used in many national symbols, e.g. on banknotes and coins, stamps and official logos. Some of these symbols were deliberately targeted by islamist terror groups in their attempt to annihilate the idea of global cultural heritage, as was the fate of the Tetrapylon of Palmyra.

Near Eastern archaeology

Near Eastern archaeology deals with human remains from South-West Asia (despite the fact that the region is often labeled as Middle East in English, the term Near East is used in archaeological and scholarly contexts). The discipline considers a time span reaching from the first permanent settlements at the beginning of the Neolithic period (10th millennium BCE) until the rise of Islam in the 7th century CE. Of particular interest is the region of Greater Mesopotamia (today Iraq, NE Syria, SE Turkey and SW Iran) and its vicinity in the 4th–1st millennium BCE. This is a region of many firsts: the first permanent settlements in human history, the first steps in agriculture and husbandry, the first cities and (contemporary with Egypt) the first empires and written documents, the first evidence for science and literature can all be traced here. Ancient Mesopotamian societies were deeply urban: cities were the focal points of important developments and the political, religious, economic and cultural centers of Greater Mesopotamia. From the beginning of Near Eastern archaeology as a scholarly discipline, excavators thus concentrated on the unearthing of large urban settlements, often visible as high mounds even before excavation. Many excavation projects in these urban centers are still ongoing, though archaeologists became increasingly involved in fieldwork at smaller and more rural sites. All sites in the focus of the InsSciDE Heritage case studies (Mari, Khorsabad, Tell Chuera) were large urban settlements, acting as regional or even superregional centers.

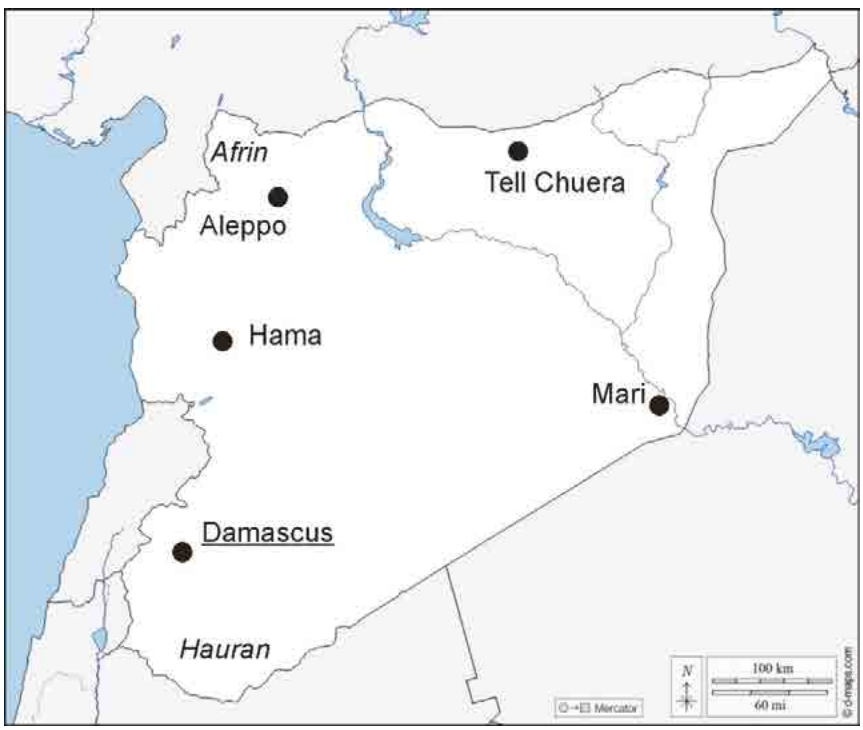
Travel to the Near East from Europe or North America was cumbersome and expensive until the 1980s. Archaeological missions thus consisted of only a small number of foreign specialists and many local workmen (up to 300 workers in the early years and still more than 100 until the 1960s). This allowed only a small degree of actual control of the excavation process and archaeologists were often not present when finds were actually made. The increased awareness of the importance of archaeological context has led to a significant increase in onsite documentation which requires the constant presence of trained archaeologists at any excavation plot. Together with the increase of interdisciplinary cooperation at excavation sites, this resulted in very different ratios of specialists and workers in modern excavations, where teams of 10–35 specialists usually collaborate with 15–75 workers.

The workers' strike of 1963 at Tell Chuera

Anton Moortgat's main interest was the development of Ancient Mesopotamian art. He started his career as an excavator relatively late in his life in his late 50s, when he had been a university professor for more than a decade. The economic situation in inter-war Germany and the isolation of the country after the Second World War prevented German archaeological fieldwork in the region until the mid-1950s. Moortgat's role model as excavator was most probably Oppenheim, with whom he worked in his Berlin private museum in the 1920s. Oppenheim was an enthusiastic excavator, but an academic outsider with diplomatic rather than archaeological training who financed his excavations in Northern Syria from his private funds and never held an academic position. Moortgat and his team were thus rather unprepared for the types of evidence they would encounter in the course of their excavations. They initially had little understanding of stratigraphy (the systematic analysis of cultural levels and their interpretation) and were mostly unaware of the more recent developments in excavation methodology. Moortgat seemed to recognize his insufficient competence and convinced an experienced excavator, the renowned prehistorian archaeologist Rolf Hachmann (1917–2014), to participate in his first campaign at Tell Chuera in 1958. Collaboration was difficult, however, and Hachmann was apparently shocked by the lack of excavation method and did not participate in further campaigns.

As was common at the time, the excavation team at Tell Chuera in the years 1958–1964 was relatively small and consisted of four archaeologists (former and actual students of Moortgat), one or two architects (for documentation of the excavated architecture) and a medical doctor (Moortgat was concerned for his ailing health). The team was completed by a servant and a cook, hired in Aleppo, and the representative of the Syrian General Directorate of Antiquities and Museums (DGAM), in 1963 Kamel Shehade, the director of the archaeological museum at Hama.

Tell Chuera is situated in a very remote area of Syria, far away from the urban centers in the country's west. The region had for a long time been populated by Bedouin nomads who were only recently settled in the 1950s. Members of the sparse local population were not used to agriculture and fieldwork. Moortgat thus hired workers from other regions of Syria. A large group of workers came from the Hauran region of Southern Syria; several of them had already experience as workers on excavation sites in other parts of Syria. A second group of workmen was hired at Aleppo and consisted of Kurds from the nearby Afrin region. The third group of workers consisted of locally engaged Bedouins. Over the years, this last group became more numerous. The non-local workmen lived in tents at the site, while the local workers arrived every morning from their homes in the vicinity. The diverse ethnic, religious and social background of the workforce caused frequent tensions. The work was organized with the help of foremen who were in regular exchange with the excavators and also served as interpreters between archaeologists and workers.



Map of Syria with mentioned sites and regions. Source: A. Pruß based on a d-maps document.

In October 1963, the usual excavation work at the site was interrupted by a strike of most of the workmen. We are informed on the events by entries of different expedition members in their diaries, which are kept in the Moortgat archive at the Archaeological Institute of the University of Frankfurt. On the afternoon of October 8, the workers were paid (as they were every 10 days). Murmurs of discontent and a demand for higher wages were voiced. Most probably in hindsight, archaeologist Barthel Hrouda soon wrote in his diary of "first indications of a revolution" (MAP 35, p6). The next day, only a few workmen showed up. The archaeologists were told the names of the (alleged) ringleaders of the strike. Some excavated structures had been deliberately damaged, allegedly by strikers. In the evening of this day, the police were called by the archaeologists (accompanied by the DGAM representative), as they feared for the security of the excavation equipment. According to archaeologist Ursula Moortgat-Correns, the ringleaders of the strike were Bedouins who demanded the dismissal of one foreman and higher wages (MAP 39, p9). The next day (October 10) the Kurdish (and some Haurani) workmen returned to work, while the Bedouins were still on strike. Police from the closest station (10 km) arrived by motorcycle in the morning and arrested the leaders of the strike. They were carried back in the expedition car to the police station where a report was filed. Those arrested had to stay the night at the police station and two armed soldiers were sent to the site to protect the archaeologists and their equipment. The next morning (October 11) Hrouda drove the soldiers back to the station. There, he was asked by the police to take the handcuffed captives and some policemen to a larger police station in the district town. Realizing that the arrested might get in severe trouble there, Hrouda (backed by Moortgat) refused to transport the captives there and they finally were driven to another small police station. Hrouda requested only mild punishment for the captives, which was promised by the policemen. No further information on the fate of the arrested strikers is recorded in the diaries. On October 13 excavation work was resumed. None of the demands of the strikers was met: the contested foreman remained in place and the salaries were not raised.

In the excavation report, which was published two years later in Germany, the strike is not mentioned directly, contrary to more specific information on minor conflicts given in reports on earlier seasons. However, the DGAM representative is lauded for standing by the team in any difficult situation, be it negotiations with the workers or technical questions of house construction or water supply.

Some of the field diaries of the Moortgat missions, a plan of excavated houses, and two flint blades from Tell Chuera. Photo: T. Helms.

Conclusions: Becoming aware of colonialist attitudes

What is striking in this incident is the total lack of direct or indirect communication between the archaeologists and the leaders of the strike. Apparently, the excavators were concerned for the protection of their property (the tools) and the archaeological site and most probably they were also concerned for their personal security. While the first actions were taken by the striking workmen, the decisive escalation of the conflict was initiated by the excavators only when they had involved the police. The police, generally underequipped (no car and probably no telephone available) and badly paid, were (and generally still are) notoriously corrupt and brutal in Syria and other states in the region. Most probably, Moortgat and his collaborators initially were not aware of the likely consequences for the arrested strike leaders in the hands of the police and later tried to de-escalate by asking for mild punishment.

A second striking fact is the relation between the police and the archaeologists, from both perspectives. As the policemen could only act with the help of the archaeologists, they appeared to a certain degree subordinate to them. In the end, the archaeologists decided where to bring the arrested workers. This seemed to be normal from their perspective. Even if the archaeologists were probably not aware of it, their conduct betrayed typical colonialist attitudes.

The representative of the Syrian antiquities directorate, Shehade, must have played a significant role during the strike. Unfortunately, the diaries in the Moortgat archive tell very little about his actions. He accompanied Hrouda to the local police station and apparently supported the archaeologists.

Archaeology in the Near East developed as a branch of imperial domination by European powers in the 19th century. This origin determined archaeological practice in the region even long after the independence of Near Eastern states. Many western archaeologists were not aware of their post-colonial behavior. Western archaeologists working in the Near East often took no steps to transfer their knowledge to local communities.

Local elites and the rural population had very little interest in common. During conflicts between foreign researchers and the workmen they employed, the elites regularly sided with the foreigners.

Western archaeologists working outside Europe are often perceived as representatives of their countries, even if they are not aware of this. Modern archaeologists must become aware of power asymmetries in view of establishing true partnerships for the protection of heritage.

Stakeholder Takeaways

For diplomats	For scientists	Overall
• The colonial past of archaeology is still influencing the perception of fieldwork in Middle Eastern states. • Even today, when all finds retrieved in archaeological excavations remain in their countries of origin, knowledge of these countries' past is still distributed unevenly.	• Scientific fieldwork in the Middle East (and other world regions) must include a critical perspective on the colonial past. This is not (only) a matter of research history, but of research design and practice. • The interests of all fieldwork collaborators (state officials, local researchers, workers etc.) must be carefully analyzed. They may match on paper but deviate significantly in reality.	• If designed as proper partnerships, joint fieldwork projects of Western and Middle Eastern researchers are still indispensable to achieve significant progress in the understanding of the region's past.

Study Questions

• What were, in the eyes of the German archaeologists, the benefits of their archaeological work for Syria and the Syrian people? For whose benefit did they carry out their work?

• What is necessary to ensure a partnership on an equal footing in present-day foreign excavations in the Middle East?

• Is knowledge of the history of archaeological work in the region relevant for present-day archaeology students and diplomatic practitioners?

Endnotes

• The InsSciDE work on Heritage will be exhaustively presented in a peer-reviewed Special Issue of Syria: Archéologie, Art et Histoire, 2023.
Dr. Tobias Helms presents his study in a superbly illustrated InsSciDE Warsaw Science Diplomacy School 2021 case video: www.science-diplomacy.eu/aiovg_videos/the-workers-strike-of-1963-at-the-german-excavation-of-tell-chuera-wsds21-case-study/

• The Moortgat Archive Project (MAP) of the Archaeological Institute, Frankfurt, preserves numbered diaries of mission members of the Tell Chuera mission.

• Cover image: Workmen at the site of Tell Chuera during the 1959 excavation campaign. Source: MAP.

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The Citadel Project:
Resuming Work at Khorsabad, Iraq

An InsSciDE Case Study

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Adjacent to the small modern village of Khorsabad in Northern Iraq are the ruins of the Assyrian capital Dur-Sharrukin, built between 717 and 705 BCE under the rule of King Sargon II. First excavations at the site by a French mission in the 1840s uncovered the remains of a splendid royal palace. After a second period of excavations in the 1930s, this time by US scholars, the site remained unstudied until recently. Most parts of the ancient capital are still completely unknown.

The site was in a good state of preservation until it was occupied by the Islamic State (ISIS, Daesh) in 2014. Satellite images indicated illegal digging activities at Khorsabad in the following years. In the autumn of 2016, Kurdish Peshmerga forces conquered the region, with heavy fighting occurring close to or even on the site.

Starting from 2016, the Citadel project directed by Prof. Pascal Butterlin has assessed the damages to the Khorsabad site inflicted since 2014. This task of war archaeology was carried forward in the frame of the European Union Horizon 2020 InsSciDE project, including the application of drone technology. Ultimately, the project aims to establish an up-to-date description of the actual state of the site, a plan for the conservation and presentation of the excavated structures, and a solid base for renewed research and excavation at this very important but insufficiently studied site.

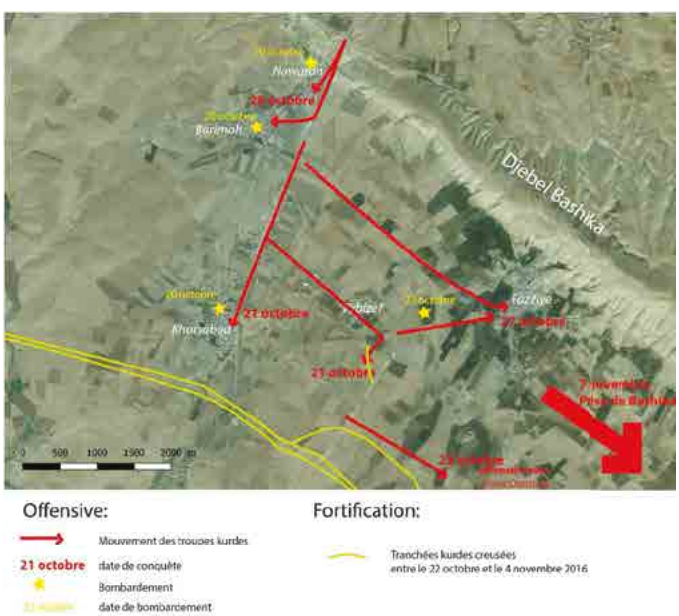


Image credit: French archaeological mission in Khorsabad

Keywords:

Khorsabad, Iraq, war archaeology, Iconem, Archaios

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

The Citadel Project:
Resuming Work at Khorsabad, Iraq

Khorsabad is an emblematic site of archaeological research in the Near East but remains a relatively poorly known urban site. Located 15 kilometers north of Mossul, in northern Iraq, the site covers the remains of the capital founded by King Sargon II of Assyria in 717 BCE. This sovereign, who reigned from 722 to 705 BCE, founded "Dur-Sharrukin", the citadel of Sargon, a royal city of 320 hectares in area, intended to be the capital of an empire which dominated all the fertile crescent of the Persian Gulf to the gates of Egypt. The site of Khorsabad has yielded rich finds in terms of both monumental architecture and art, and understanding of the political mission of the Assyrian kings. It offers great potential for knowledge of urban construction. Today, however, the work of archaeologists, in partnerships established between Iraqi authorities and foreign experts, must equally document and preserve the site from contemporary damage and belligerent destruction. The new discipline of war archaeology, integrating new technological approaches as well as new models of cooperation, offers a particular view on science diplomacy.

Various archaeological operations took place on the site, starting with two major French excavations (1843-1844 and 1851-1855). P. E. Botta and E.N. Flandin published the "Monuments of Ninive" in 1849, while V. Place and F. Thomas published two volumes on "Ninive and Assyria" in 1867 and 1870 (all in French). Subsequently, research by the Oriental Institute of Chicago (1929-1934) allowed G. Loud and his teams to publish volumes on "Khorsabad Excavations in the Palace and at a City Gate" in 1936 and 1938. Finally, F. Safar's excavation for the Iraqi department of antiquities uncovered the "Temple of Sibitti at Khorsabad" (1957). Colossal figures and carved reliefs once decorating the doors and walls of this palace were brought to the Louvre, where they form the core of the museum's Assyrian galleries. Exceptional sculptures are exhibited too at the Oriental Institute of the University of Chicago.

Khorsabad on the map. Source: French archaeological mission in Khorsabad.

The city itself, whose possible existence had already been discussed by Place in the mid-19th century, then confirmed by American research, nevertheless had never been fully traced, to judge from the relatively empty maps and sketches of its possible layout proposed over the years. Yet it must be considered an archetype of the great imperial capitals. The construction of this great urban ensemble, well documented in particular through the royal inscriptions recently republished by Frame (2021), and by the correspondence of Sargon II (Parpola, 1987; 1990), made up part of the imperial mission of the great Assyrian kings. It was conceived as a new world city.

As such, Khorsabad has been the subject of much reflection on the meaning to attribute to this civilizing gesture of the Assyrian sovereign. Again and again, contemporary research has attempted to relate the inscriptions to what is known of the physical archaeological site, in particular of its enclosure, its gates and its environment (Margueron, 2013; Politopoulos, 2020). Due to the political situation in Northern Iraq, from the 1960s on the site has remained unplumbed despite its extraordinary historical significance. Khorsabad offers a unique opportunity to explore a whole city and develop a heritage program.

The development of a new project at Khorsabad

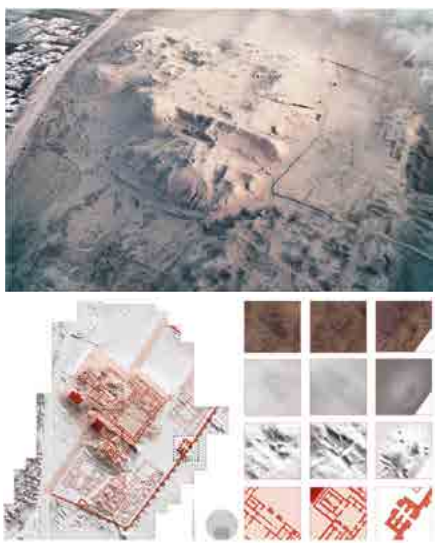
The development of a new 21st century project to explore and understand the Khorsabad site is the result of the convergence of several elements: the long-term interest in research on the constructions of the great King Sargon II; the 3D modeling of the site undertaken by the Louvre Museum; and the requirements of a very particular field location, which has suffered from the turmoil linked to the various conflicts that have occurred in Iraq over the past twenty years.

The occupation of the site by Daesh in 2014 led us to undertake, with the company **Iconem**, the documentation of the damage suffered by the major Assyrian capitals, particularly Khorsabad, located on the front line between the territories occupied by Daesh and the Peshmerga, at the foot of Jebel Bashiqa. A first assessment of the damage was produced under the author's direction by Mathilde Mura in 2015, and presented at the exhibition *Cités Millénaires* at the Grand Palais museum in Paris in December 2016, under the patronage of President François Hollande. This was part of the progressively growing awareness of the dangers to which the cultural heritage of the zone was exposed and its deliberate targeting by Daesh. Khorsabad, like the other capitals of the Neo-Assyrian empire, Nineveh and Nimrud, was attacked and plundered, albeit without deliberate destruction of monuments. Left untouched by previous Iraqi restorations, the site did not display any reconstruction of monuments: this effectively saved the great palace of Sargon II, at least from dynamite.

Protagonists and stakes: From outside Iraq

Paul-Émile Botta (1802–70) was a French doctor of Italian background, son of a famous historian. After a world tour, he went to the Middle East, was involved in Greece's war of independence, and became the personal doctor of the Egyptian ruler Mehmet Ali. He met Benjamin Disraeli, the future British prime minister, who became his friend. Back in France he entered the diplomatic corps and was subsequently appointed consul at Mosul, where he developed a close relationship with his British counterpart Austin Henry Layard. In 1843 he started excavations, first at Nineveh and soon after at Khorsabad, where he discovered Sargon's royal palace dating from the 8th century BCE, adorned with splendid alabaster relief slabs and colossal gate sculptures. A selection of the finest pieces was sent to the Louvre where they were hailed as a spectacular enrichment of the nation's most important museum.
[Visit them here:
www.louvre.fr/en/explore/the-palace/the-palace-of-sargon-ii]

Botta, however, was never rewarded for his discoveries and was disgraced after France's 1848 revolution as a member of the old regime, while Layard became the celebrated hero of the discovery of Nineveh. Back in the Near East as consul of France in Jerusalem, Botta personally led multilateral negotiations in the aftermath of France's 1847 demand for Roman Catholic control over the Church of the Holy Sepulchre and other sites disputed among the religious currents present in the city including the Russian Orthodox Church. The conflict, enlarged to questions of different citizens' rights and political control, drove to full-scale war between the Ottoman Empire, allied to France and Britain, against the Russian Empire: the so-called Crimean War (1853–56).



Khorsabad, preliminary damage assessment. Source: Iconem; M. Mura (2021).

The Khorsabad site was occupied by Daesh and then was at the center of battle with the Kurdish Peshmerga who took over the site in October 2016. One battle took as its front line the southern city wall. The phases of modern occupation and their site consequences were documented by Jean-Jacques Herr of the French archaeological mission, using ground, drone and satellite photography: the fortifications of the citadel were reinforced by the belligerents and the southern enclosure of the city was integrated into a system of trenches and forts separating Daesh from Peshmerga positions during the battle of Mosul.

Battle on the site of Khorsabad; occupation of the lower city east, and bombardment of a tunnel, 23 October 2016. Labels indicate olive groves (vergers d'oliviers), Peshmerga positions, hangars, and reinforcements/trenches (enceinte creusée). Source: Jean-Jacques Herr, French archaeological mission in Khorsabad; photos ©TRT Espagnol.

Protagonists and stakes: From outside Iraq

The French government: When the images of deliberate destruction of heritage sites by Daesh in 2014/15 shocked the outside world, French President François Hollande used the opportunity to present his country as a leading protagonist of Heritage Protection and as the complete antagonist of the jihadists. He used the background of the Khorsabad hall at the Louvre to launch a cultural heritage initiative which includes several exhibitions, but also actions to protect the endangered heritage sites especially in Iraq. The reestablishment of a French archaeological mission at Khorsabad developed from this initiative.

Protagonists and stakes:
Different political and military groups in Iraq

The presence of different political and military actors in the northern Iraqi region around the city of Mosul created a very delicate balance of power in the region. The situation is still volatile. The different actors are:

The Iraqi central government and its institutions: The central government at Baghdad is interested in showing presence in the recently reconquered northern provinces. Promoting cooperation projects there with Western partners opens the perspective of regional development and economic stabilization. Having foreign archaeologists at work there can help to convey the message of a return to normality to both locals and foreigners. Organizing these projects from Baghdad might help to curb the influence of local militias.

Local pro-government militias: Large parts of the vicinity of Mosul are presently controlled by militias allied with the Iraqi army, but having their own, often sectarian agenda. These militias are based in central and southern Iraq and were instrumental in the reconquering of Mosul and its hinterland in 2016/17. They want to retain some degree of independence from the Iraqi army and are thus eager to keep their grip on the region by maintaining frequent roadblocks. The ongoing presence of Daesh/ISIS groups in the region furnishes the pretext to keep their positions.

Daesh/ISIS: The radical Sunni jihadists lost their state and the institutions they had created within it. However, they have retreated to guerilla tactics and still have the support of parts of the local Sunni Arab population. It is their aim to prevent central Iraqi institutions from being effective, and to reestablish a powerful position. Cultural heritage means nothing to them and they actively attacked prominent heritage sites in the region. As the archaeological site of Khorsabad had not been established as a tourist destination, it suffered no deliberate destruction during the Daesh rule. However, it was affected by plundering.

The villagers of Khorsabad: The village of Khorsabad, which gave its name to the archaeological site, is populated by Kurds, Shiites, and Yazidis – a religious minority who suffered heavily by the Daesh genocide in other parts of Iraq. The villagers of Khorsabad fled to safe areas in 2014 and many of them returned after Daesh was expelled. The establishment of an excavation project and the development of the ancient city as a heritage site would bring prospects of security and economic development to the village.

The Kurdish regional government and its Peshmerga army: The Peshmerga actually fought Daesh between 2014 and 2016 and defeated them in Khorsabad and its vicinity. This enlarged the buffer zone between the Daesh center at Mosul and the core of the Kurdish region around Erbil. After the victory over Daesh and some clashes between Kurdish and central Iraqi forces in 2018, the Peshmerga retreated to the actual line of control before 2014, which brought Khorsabad into the influence zone of a pro-government Iraqi militia. The Kurdish institutions have little actual influence at Khorsabad, but they are interested in maintaining their position as the most reliable pro-Western actor in the region.

Working in a highly sensitive border region

The French archaeological mission of Khorsabad was created in 2019 as part of the FSPI Archirak program, of which it is one of the three components. From 2020, it has been supported by the French ministry of foreign affairs' consultative commission on archaeological research abroad. This war archeology program conducted at Khorsabad offers an excellent case study in the frame of InsSciDE: developed by the French embassy, it associates the state board of antiquities and heritage (SBAH) in Baghdad, and various enterprises, notably start-ups with specific tasks: demining by an NGO, drone coverage by Iconem (financed by InsSciDE), the survey of the site by Archaios, the geomagnetic survey by the University of Munich, with the support of Airbus Industries for the satellite coverage and 3D modeling of the environment of the city.

This mission has included intense preparation, and monitoring of the damage to the site that has taken place since 2014. Its purpose is to establish a diagnosis of the state of the site, its archaeological potential and the prospects for both science and heritage preservation, the objective being to provide expertise and an archaeological site for a long-term action of scientific and technical cooperation with Iraqi partners, the SBAH and the University of Mosul. The site is located in what continues to be a highly sensitive region, just south of the border between the autonomous region of Iraqi Kurdistan and the area controlled by the Iraqi central government, in a region where Daesh cells are said to be still operative between the refugee camps and the Jebel Bashiqa cliffs dominating the site.

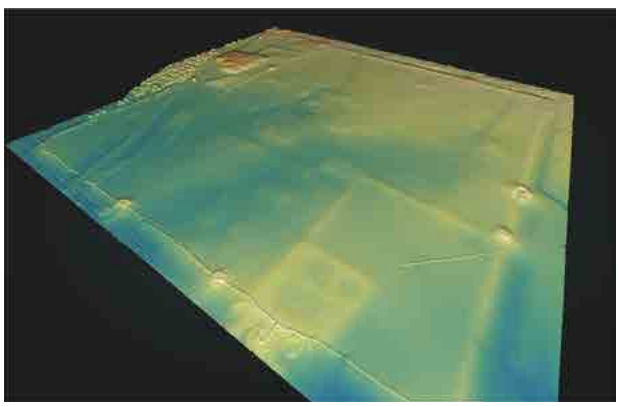
To resume the study of the site, a new topographical survey was necessary, in order to assess the evolution of the site since the last topographic survey carried out by the Oriental Institute of the University of Chicago and to correct or complete it if necessary. The new topographic plan was produced from drone coverage of the site carried out in December 2020 and January 2021 by Iconem with the support of the Mosul antiquities department, under the direction of Ali Hazim and within the framework of the European Horizon 2020 InsSciDE project.

This operation was complicated by the security situation in Northern Iraq, where Daesh cells are still operational. The French embassy cultural service supported the mission's request addressed to the SBAH in Baghdad. Once this was accepted, Iconem's assessment of the destruction in the old city of Mosul afforded an opportunity to conduct a training program for the Iraqi staff of the museum. With the protection of the local militia, they conducted the drone overflight of Khorsabad without any problem.

Protagonists and stakes: From outside Iraq

Archaeologists from France and other countries: Despite being one of the most prominent sites in Near Eastern Archaeology, the ancient Neo-Assyrian capital of Khorsabad to a large extent remains little understood. The renewed archaeological mission provides the perspective to fill this empty shell with a multitude of insights into an imperial capital of the late 8th century BCE. The site has the potential to keep archaeologists busy for many years.

The flight was restricted to the archaeological perimeter, including the whole line of the ramparts and the cultivated fields within it. This is of special significance since the whole city lies under these fields and remains unknown. The photos taken for this purpose allowed the development of a 3D model by Iconem. This model covers the entire archaeological perimeter: the citadel in the background with the great royal palace, the palaces of the great dignitaries and the temple of Nabu, the god of wisdom, and in the foreground, enveloped by its easily recognizable enclosure in the topography, the lower town.

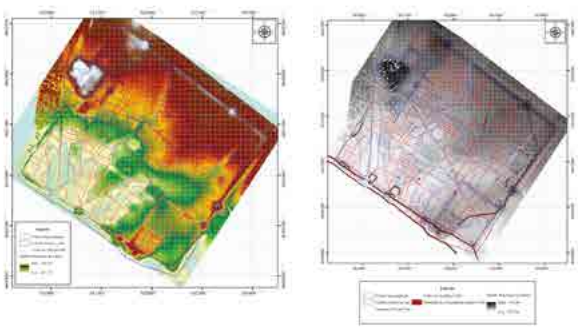


Khorsabad, topographic model. Image credit: Iconem; French archaeological mission in Khorsabad.

Value of the 3D topographic model for archaeology

While such images as the Iconem topographic model may look artificial, they contain precious information. The colors communicate altimetry. Blue and green are the lowest points, whereas yellow moving to red to white convey progressively higher points. The model thus enables visualization of archaeological structures which are actually not visible on normal photos. It is thus a very valuable tool for further research. Such images have become standard in archaeological publications in recent years and they represent a significant epistemic progress. For archaeologists, this image is much more valuable than even the finest photo.

In November 2021, a short visit at the site was authorized in order to complete the drone observations. Jessica Giraud and Mathilde Mura (**Archaios**) went to the site, with the cooperation of the Suleymaniyeh directorate of antiquities and the authorization of the SBAH in Baghdad. They took the road from Erbil to Mosul, up to the border between the autonomous Kurdistan region of Iraq and Iraq proper, where they were welcomed by the "mobilisation" militia who protected the convoy up to Khorsabad. The pictures they took verified that the archaeological potential of the site was intact, leading to further developments.



Damage assessment and archaeological potential

A textured 3D model representation made it possible to summarize the detailed study of the various elements still visible on the surface of the land: the unevenly preserved enclosure, the doors clearly traced, the sector of the arsenal with its enclosures (in the lower right), Palace Z and other well-marked topographic elements. The main mound excavated during the 19th and 20th centuries shows the remnants of the great palace, heavily damaged by recent activities, and beneath it the palaces of the great dignitaries and the Nabu temple.

Further textured 3-D models were developed from other vantage points, and a grid was defined to delimit the study areas. Major elements for consideration include the path of various wadis (ravines or channels) that drain the site seasonally, and a series of clearly visible hillocks – priority elements for investigation since they are likely to preserve archaeological remains.

Mathilde Mura (2021) carried out the survey work on the recent damage to the site following looting and military occupations, in particular the 2017 occupation of the site by the Peshmerga. The result is a site map showing the various types of damage observed.

The palace terrace was fortified in several stages, and it suffered looting. It was originally a military building erected at the top of the acropolis of the site, and protected by a series of subcircular trenches. This system was powerfully reinforced by the construction of a subcircular earth levee, then by a real line of fortification following the crest line of the site, from the heart of the great royal palace to the old ziggurat. The site of the great palace thus presents a whole series of stigmata of these constructions which were dismantled following the return of the Iraqi army to the site in the fall of 2018.

Technoscience

The Khorsabad case study highlights the importance of remote sensing methods in modern archaeology. The analysis of satellite images and the processing of images provided by unmanned aerial vehicles (UAV) can never replace actual excavation at an archaeological site. However, these methods can provide information and insights never attainable by groundwork operations and are thus a precious complement to more traditional methods of archaeological fieldwork. This is true at all sites which have traces of their archaeological past visible on their surface, but it is especially useful in zones of unstable security. The first damage assessments at Khorsabad were undertaken in 2015 (before the start of the InsSciDE project) using images provided by drones which flew over the site which was then still under Daesh control. These images provided details unavailable from satellite images and enabled targeted interventions once the site became accessible on the ground. The 3D image provided by Iconem (financed by InsSciDE) on the base of multiple drone images already yielded more information on the city of Khorsabad (outside the already excavated terrace of the royal palace) than had done all previous excavations at the site. These works are thus an ideal base for the renewal of actual fieldwork at the site.

Khorsabad, the palace terrace: in yellow, conflict scars; in red, fortifications; in blue, earth raised to protect the Peshmerga fighters. Image credit: Mathilde Mura, Archaios; French archaeological mission in Khorsabad.

Conclusions: War archaeology

The site of Khorsabad has yielded rich finds in terms of both monumental architecture and art, and understanding of the political mission of the Assyrian kings. It offers great potential for knowledge of urban construction. Today, however, the work of archaeologists, in partnerships established between Iraqi authorities and foreign experts, must equally document and preserve the site from contemporary damage and belligerent destruction. The new discipline of war archaeology integrates new technologies as well as particular modes of cooperation – whether these concern joint knowledge development, capacity building through transnational training, or basic security afforded by armed escort. The everyday actions of war archaeology offer a particular view on science diplomacy.

The Citadel project directed by Prof. Pascal Butterlin has assessed the damages to the Khorsabad site inflicted since 2014. This task of war archaeology was carried forward in the frame of the European Union Horizon 2020 InsSciDE project, including the application of drone technology. Ultimately, the project aims to establish an up-to-date description of the actual state of the site, a plan for the conservation and presentation of the excavated structures, and a solid base for renewed research and excavation at this very important but understudied site.

Stakeholder Takeaways

For diplomats

- Promoting projects in the fields of heritage protection/ conservation and archaeological fieldwork is a valuable tool to build up and strengthen mutual trust and understanding between European and Middle Eastern states.

- Archaeological projects are a good choice to enlarge Western engagement in the Middle East beyond the domain of military security, as archaeologists are frequently accustomed to work in delicate environments.

For scientists

- The Assyrian capitals, where Near Eastern archaeology was born in the 19th century, are still understudied in many respects. It is time to return to these sites.

- New archaeological projects at large urban sites in the region must be designed as true partnerships with local colleagues and institutions and must include designs for competence building as well as economic development for local communities.

Overall

- Despite the horrifying images of temples and palaces destroyed and heavily damaged by Daesh, many important archaeological sites in the Middle East are still relatively intact.

- To protect these sites from everyday threats (building activities and intensified agriculture) demands swift action and a project design of integrated research, protection and development.

Khorsabad and its enclosure wall, seen from the Nineveh plain. At the foot of the Jebel Bashiqa in the background begins the area controlled by the Kurdistan regional government. Image credit: Archaios; French archaeological mission in Khorsabad.

Study Questions

• Why was Khorsabad spared from deliberate destruction by Daesh, in contrast to other Assyrian capitals (Nimrud, Nineveh) in the region?

• Why did French president Francois Hollande choose the Khorsabad hall of the Louvre to exhibit new technologically mediated images and launch a cultural heritage protection initiative?

• Why did the archaeological research at Khorsabad focus only on the terrace of the royal palace leaving aside any study in 180 years of the ancient city itself?

• What does this detailed account of Khorsabad research teach about science diplomacy?

Endnotes

• The InsSciDE work on Heritage will be exhaustively presented in a peer-reviewed special issue of Syria: Archéologie, Art et Histoire, 2023.

• Palaces F and Z are ancient structures identified by archaeological works at Khorsabad, designated according to the code attributed to them in site documentation.

• Boxes on Actors, Stakes, Technoscience, and Takeaways benefited from the contribution of Prof. Alexander Pruß, JGU Mainz.

• Cover image: Khorsabad; site of the battle of Khorsabad and movement of the Peshmerga against Daesh, October 2016. Source: Jean-Jacques Herr, Mission archéologique française à Khorsabad.

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Pascal Butterlin

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Selected Publication

(2022) Le projet citadelle de Sargon : une ville et un site archéologique dans leur environnement d'hier et d'aujourd'hui. In Thomas A et al (eds) Actes de la LXVe rencontre assyriologue internationale. Peeters, Leuven

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Health

Health: Diplomacy as a Tool for a Strengthened and Innovative Europe

Katharina T. Paul (UNIVIE) and case study authors

Facing the need for global action towards health, and also the continuous need for traditional state-based management of public health matters, what shape does health diplomacy take in the current pandemic age? What can be learned from historical and contemporary practices?

The very concept of health is complex and expressed in different ways. Individual or population health, mental or physical health: all of these are inseparably linked, but valued in different ways. This diversity, and health as a global and European goal, hinges upon diplomatic practices that reconcile and align a variety of actors (scientists, decisionmakers, patients), values, and manners of approach.

The InsSciDE case studies on health diplomacy take as a starting point that health has always been a global phenomenon, but that it is made governable in distinct practices that involve: (i) knowledge creation; (ii) negotiation and communication between different actors; and (iii) assigning meaning and value to objects, including technologies and scientific samples. Our case studies identify knowledge practices at different scales, be they datafication projects (Pichelstorfer and Paul) or standardization projects (Vlantoni) by intergovernmental bodies at the WHO and EU level; bilateral diplomacy by French scientists to study and protect biodiversity (Le Roux); or multilateral diplomacy by scientists and foreign policy officials at local, national and global scale (Paillette). Our case studies also point out that science and science diplomacy – including its manifestation in health diplomacy – are not value-free apolitical undertakings, but always already linked to political projects, personal values, and in many cases, joint interest … or competition. Health diplomacy may focus on the common good, as in the casesexplored by Vlantoni (blood safety and distribution) or Pichelstorfer and Paul (global immunization against disease). At the same time, health diplomacy may face the tensions of scientific and economic competition, as in the cases presented by Paillette (health diplomacy when science was first taking the measure of the global circulation of infectious diseases) or by Le Roux (arrangements to fund and sustain international research and collaboration – and protect global goods from destruction).

Taken together, our case studies generate two central conclusions. First, diplomacy emerges from the need to mediate between the global and local levels. Such mediation is often facilitated by appeals to science as a shared language, initiatives for standard setting, and calls for joint data collection. Yet there is a risk then of reducing science diplomacy to a set of technical, apolitical practices, whereas we would argue that it is acutely political. For instance, the sharing of data in the COVID-19 pandemic may have been an important means for global and EU cooperation – yet it stood in stark contrast to the application of traditional diplomatic actions such as border closures. In other words, science diplomacy continues to be a necessary, but not sufficient mechanism to achieve European or global cooperation towards health.

Second, we identify a methodological need to attend to actual practices of actors, rather than merely their outcomes (e.g. treaties or other diplomatic agreements). We addressed this need in part by gathering stakeholders and scholars in our InsSciDE seminars. In our collaboration and our individual study, we urged that questions be asked of what makes health diplomacy a distinct practice and what shape does it take historically (Le Roux and Paillette – using archival research) and which material, infrastructural manifestations can be identified in contemporary contexts (Pichelstorfer & Paul; Vlantoni – using interviews and document analysis). This focus on practices brings to light "informal" diplomatic practices, and the ways in which these affect health diplomacy at different scales.

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

The Role of Data in Health Diplomacy

A Case Study on Global Vaccination Governance

An InsSciDE Case Study

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Vaccination has become a global concern as intergovernmental actors such as the World Health Organization (WHO) have reinforced their efforts to foster transnational collaboration on vaccine-preventable diseases. As the ongoing COVID-19 pandemic has once more made visible, such global efforts are challenged by the contingencies of national immunization programs. Divergences between the global and the local, we show, are sidelined and resolved diplomatically in WHO data practices. We conceptualize data practices as a form of health diplomacy and their infrastructures as constitutive of global vaccination governance and diplomacy. Based on interviews with global health actors and an extensive documentary analysis, we show how datafication is both an effect of and a means for health diplomacy. We further discuss some of the political implications of datafication, such as rendering political problems into technical ones.

Image credit: iStock.com/photojog

Keywords:

WHO, vaccination, data, global health, metrics

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

The Role of Data in Health Diplomacy:
A Case Study on Global Vaccination Governance

Global data sharing has become essential to achieving rapid responses to outbreaks in the ongoing COVID-19 pandemic. As the crisis has shown, efforts to foster transnational collaboration on vaccine-preventable diseases are challenged by national public health practices. Still, there is a long experience of immunization data sharing, with its own history of diplomatic and scientific exchanges regarding such diseases as polio or measles. Our interviews with global health actors reveal the entanglement of technical and political goals in data infrastructures created by health diplomats. They further show that diplomatic negotiations between governments and nonstate actors are enabled through such data infrastructures, which help to (re)produce and strengthen relations between different actors and their interests.

Data, enabling and shaping international cooperation in public health

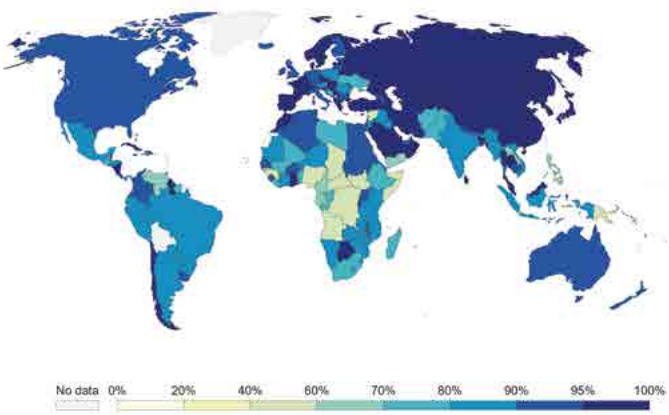
The United Nations World Health Organization (WHO) and other intergovernmental actors have attempted to frame public health not as national, nor even "simply" international, but as a global issue, entailing their own (re)positioning as coordinators and leaders of global health initiatives. The principle of national sovereignty, however, challenges such efforts. Despite global efforts towards enhanced harmonization and coordination, the development of public health policies remains largely within the remit of individual countries. Immunization is a case in point: financing, definition of target groups, and implementation of vaccination programs are not just national, but at times even subnational matters.

The past few years have seen an increase of calls for improved cross-border cooperation on immunization. The 2019 Global Vaccination Summit to propel action against vaccine-preventable diseases and against the spread of vaccine misinformation, jointly convened by the WHO and the European Commission (EC), is but one symbolic example.

What form can transnational cooperation take, given the increasing recognition of immunization and other public health matters as cross-border issues, and the limited symbolic, financial, and political resources of actors such as the EU and the WHO? What practices can intergovernmental and supranational health diplomacy invoke, given the diversity of delivery systems, vaccination schedules, and cultures of care and medicine? Our case study draws attention to the role that data plays for enabling and shaping international cooperation in public health.

History has shown that while immunization programs are largely shaped by and dependent on the national context, vaccine development and administration have often been tied to diplomatic activities (Hotez 2014). Those ranged from bilateral vaccine delivery activities or joint vaccine development to the endorsement of the Global Vaccine Action Plan by WHO member states or the establishment of GAVI, the Vaccine Alliance. The WHO has long been engaged in and a site of diplomatic activities, and took a leading role in global vaccination governance. However, mundane diplomatic practices in the transnational coordination of efforts to vaccinate the world have so far gone unnoticed in the literature of global health and vaccine diplomacy. Our case study will thus introduce an analysis of the practices of data collection, curation and use.

Our case study sits at the nexus of global health diplomacy and data diplomacy (Boyd et al. 2019), zooming in on the data practices of the WHO to show how the increasing use of data is both an effect of, and a means for, health diplomacy. In the case of immunization, science or data diplomacy goes beyond the multilateral negotiation of standards for data collection, storage and communication. Data practices themselves become important sites for the WHO to steer EU and member states towards achieving the immunization goals and standards it has set.



Share of one-year-olds vaccinated against polio (Pol3), 2019
Source: World Health Organization (WHO); UNICEF

Protagonists

A multiplicity of (global) immunization governance actors

The WHO has traditionally taken the lead in global efforts to improve (childhood) immunization. Since the 1990s, however, its role in drafting policies and negotiating agreements has been weakened. Other actors such as the private Bill and Melinda Gates Foundation are increasingly present in global health promotion. Cooperation with private actors has also been institutionalized in the form of GAVI, the Vaccine Alliance, and brought a shift from intergovernmental decision-making to multi-stakeholder governance. In the European Region, EU institutions such as the European Commission and the European Centre for Disease Control (ECDC) claim authority as well, in both defining policy goals and providing expertise. Potential competition aside, these intergovernmental or supranational institutions face similar constraints: they lack a political mandate in matters of public health, and they also lack budget and staff, as became particularly visible in the ongoing COVID-19 pandemic. Furthermore, in such organizations the member states play an important role, and must deal with the perception that globally directed efforts challenge national sovereignty. Finally, intergovernmental organizations are particularly sensitive to the wider geopolitical environment.

Alongside institutions, individual experts whom we have interviewed conveyed that they often act as informal diplomats. Among these were civil servants working at the WHO and in national ministries, most with a professional background in public health, medicine, or statistics; and scientists participating in expert committees, involved in providing and using scientific expertise on data, and the development of standards, indicators and methodologies for data collection on immunization. Our interviewees did not classify themselves as science diplomats or health diplomats. Yet, some of them referred to parts of their activities as "engaging in health diplomacy".

World Health Organization Headquarters, Geneva. Source: iStock/mseidelch

Stakes

Combining different interests in data infrastructures

Global health lacks a central authority to enforce emerging regulation (as the COVID-19 pandemic confirmed). While International Health Regulations (IHR) are binding for WHO member states, many struggle to comply fully and view global health obligations as a restraint on national sovereignty. In addition, private actors are increasingly seeking to steer global health policy (determining problems, goals, resources, and solutions). How does the WHO then manage to influence and reconcile these different public health agendas?

One means available to WHO to claim political authority is by providing technical assistance as well as knowledge and expertise for policy. This knowledge rests upon standardization and data collection practices. Yet setting up data infrastructures is not a mere technical exercise, but itself a political action that empowers certain actors.

For the WHO, data collection is connected to their efforts to be recognized as a global health authority, to define which data on which disease should be collected and how that data should be used. Ultimately, WHO aims at increasing the immunity of the global population through the use of data. Private actors, who often act as funding bodies to the WHO and to specific disease eradication programs, also make use of this data and articulate specific needs as to how that data should be collected and used (with a strong focus on accuracy and data quality to support assessing the effectiveness of their interventions). Member states – which are responsible for collecting the data – often have different interests, such as maintaining their sovereignty, getting funding for their immunization programs, and also making use of centralized data to learn more about the immunity level of neighboring countries.

Lacking the mandate to prescribe how countries should organize their public health system and collect data, and being dependent upon funding from and cooperation with nonstate actors, WHO has focused its activities on seemingly technical aspects of collection and the development of new data infrastructures, through which new visions of governance are articulated in which "better data equals better health". Data infrastructures bind together different players, their interests, and practices that are dispersed across sites. Struggles to negotiate standards and mechanisms for data sharing, as well as to determine who is vested with authority to collect and analyze the data, are simultaneously power struggles between different actors of global health.

Technoscience: Public health data and data infrastructures as a form of governance

Today, global health is saturated with metrics (Adams 2016). Evidence-based policy making, knowledge creation and data are placed upfront. Recent initiatives call for ever better collection and quality of immunization data. They crystalize a vision of disease prevention at whose "heart [is] the belief that efforts to save lives have to be based on rigorous epidemiological data in order to be effective" (Reubi 2018, 84).

Data infrastructures form the basis upon which knowledge about public health (and any other transnational, data-hungry global challenge such as climate change or biodiversity) is created – framing and enabling the representation of the state of the world (and its state of health). Data infrastructures produce the knowledge needed to govern, and thus influence and shape governance practices. In this way, data infrastructures are themselves a form of governance.

For immunization, vaccination coverage rates became important indicators. Coverage rates are expressed as a fraction: the number of individuals who have received the vaccine divided by the number of eligible individuals in the specific population. The enumeration of these individuals varies widely across countries. Population data is estimated and calculated differently across administrative systems. Means to track information on who is effectively vaccinated range from paper spreadsheets to digitized central registries. These divergences make comparison difficult, whence a thrust to disseminate new, more standardized methods and practices across e.g. WHO member states. Furthermore, new data collection infrastructures (with their tools and methods) are set up, such as the WHO Immunization Information System (WIISE) funded by the Bill and Melinda Gates Foundation. Similar projects emerge at EU level, such as EVACO (European Vaccination Coverage Collection System) or EVIS (European Vaccination Information Sharing System), aiming to define and implement standards by which coverage rates shall be calculated.

The construction of data infrastructures, how they manifest relations between different actors, and how they enable particular epistemic practices all shape the ways health and immunization issues become knowable and governable.

Co-evolution of metrics and global immunization programs

The WHO has a long history of collecting data on public health, in particular on infectious diseases. The International Health Regulations (IHR) form the legal framework for international cooperation on global and national responses to contagious diseases. The IHR also direct which surveillance data must be collected, shared, and reported. The mandated practices are the outcome of data diplomacy: activities and negotiations which aim to advance the sharing of data in international relations.

The WHO has positioned itself to provide expertise on health metrics since the 1970s. The focus on metrics and health data was fueled by global efforts in the second half of the 20th century to vaccinate children around the world. With the WHO's introduction of the worldwide Expanded Program on Immunization (EPI) in 1974, goals to be achieved by member states were translated into targets that could be measured and evaluated and required the collection of an increasing amount of data. From this point onwards, countries reported immunization data to WHO, which used it to gain an overview of vaccination coverage rates across states and regions.

Immunization data and in particular metrics such as coverage rates informed subsequent policy development by shaping the very understanding of the issues at stake. Coverage rates have been highly successful tools for actors to highlight under-immunization. The problematization offered by coverage rates shaped WHO's increasing push in the late 1990s for greater immunization policy coordination. This had two important effects.

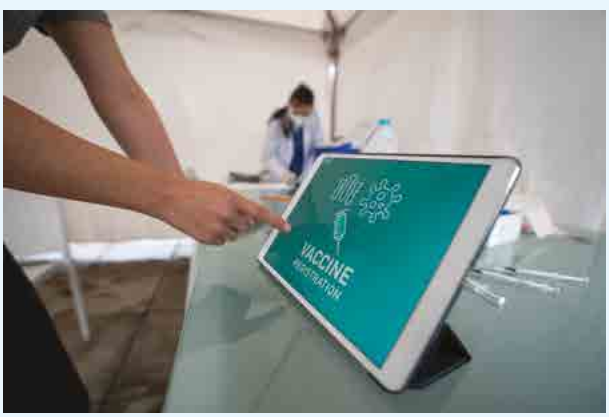
First, the collection of vaccination coverage data shed light on global inequities, and in this way also actively defined immuni zation as a policy problem that required global solutions. Coverage rates thus co-produced the need for monitoring and managing immunity through global actors such as the WHO. By helping to create knowledge about immunization on a global scale, the required data collection also helped to promote the WHO as the responsible authority for global immunization governance.

Second, immunization data informed formal or core health diplomatic negotiation that led to international agreements such as the Global Vaccine Action Plan, which was endorsed by WHO member states at the World Health Assembly in 2012. Data on immunization thus fed into and shaped diplomatic activities aiming to develop global agreements.

Global health diplomacy

Global health diplomacy is a newly emerging field for researchers and practitioners and "describes the practices by which governments and non state actors attempt to coordinate and orchestrate global policy solutions to improve global health" (Ruckert et al. 2016). It includes (i) core diplomatic activities involving official representatives or states or international organizations, such as the 2005 revision of the IHR, (ii) multistakeholder diplomacy, i.e. bilateral or multilateral partnerships, or global initiatives involving not only state actors, but also government agencies, NGOs, philanthropies, and multinational organizations who work together in global health diplomacy (such as the Vaccine Alliance GAVI, a public-private partnership between the WHO, UNICEF, World Bank, and the Gates Foundation); (iii) informal diplomacy, i.e. interactions between public health actors from international and transnational organizations and their counterparts in the field, involving host country officials, representatives of multilateral and nongovernmental organizations, private enterprises, and the public (Katz et al. 2011). Actors working in this field of diplomacy are usually technical experts in public health, e.g. specialists who negotiate standards or procedures and provide assistance or guidance to other states, as well as scientists engaged in international research collaborations. These actors are often unaware of their representative function.

Despite the fact that global health is saturated with metrics, the scholarly literature on health diplomacy has not previously examined the constitutive role of data practices for international relations. Furthermore, health diplomacy is rarely researched in its routine and everyday form, but instead mostly focuses on public health emergencies, as a result of which more mundane practices have gone unnoticed, in particular that of datafication.



Source: iStock/andresr

Co-evolution of metrics and global immunization programs

Calculation of coverage rates and collection of immunization data are usually implemented by public health experts distributed across different sites, in a complex and variable process. Some countries collect data at the site of administering the vaccine, for instance at a clinic, to then send numbers to district or national public health offices, using excel sheets or paper; some enter the information into a centralized digital database, whereas others instead use post-hoc coverage surveys to learn more about the share of the population vaccinated against a given disease. Data is usually collected at the national level before it makes its way to the WHO headquarters where it is further processed, validated and used.

These variations in data collection, the fact that sometimes different coverage rates are published for one and the same country, and finally the fact that disease outbreaks still happen in countries reporting high vaccination rates, have brought the accuracy of immunization data into question. Public health scientists and expert groups advising government bodies, private actors, and the WHO have all called for better data infrastructures and more harmonization to improve the quality of immunization data.

Yet the WHO has no mandate to prescribe how countries collect and use data, or organize their public health system. Improving data infrastructures nonetheless requires knowledge and resources, and may be difficult to implement for member states. Furthermore, states don't necessarily share the vision of global health actors according to which better data leads to better health. Faced with the scientific problem of lack of accuracy, and the political problem of lack of mandate, the WHO developed new methodologies to address low data quality and implemented a new technical tool to increase harmonization of state practices. The Joint Reporting Form (JRF) was developed and published by the WHO together with UNICEF in 1998. All WHO member states agreed to send their coverage data using this form. The high degree of compliance with reporting guidelines in the succeeding years (e.g. in 2018, every member state reported data) demonstrates that the JRF became the dominant infrastructure for gathering and calculating coverage rates globally. The JRF was implemented as an excel sheet to be filled out by member states and returned to the WHO once a year. It is currently being revised, with the aim to set up a digital information system for the collection of immunization data.

The JRF became successful because it is flexible enough to allow for local variety, yet standardized enough to create 'objective' numbers viewed as reliable and trustworthy. It helps to

translate the contingencies of governing immunization in different countries into a technical form that aligns different interests (e.g. receiving funding for improving the health care system, improving global health, eradicating a disease) toward WHO's overarching goal of reducing and managing infectious diseases. It sets standards as to what data shall be collected, but not how that data shall be collected (meaning that member states can still decide whether they will employ surveys, centralized information systems, or any other system they have in place). It is this sensitivity to context and its mediation between global standards and local practices that made the JRF a successful diplomatic tool. Given the high level of member state compliance with annual reporting, the implementation of the JRF constitutes a case of successful global health diplomacy for data sharing.

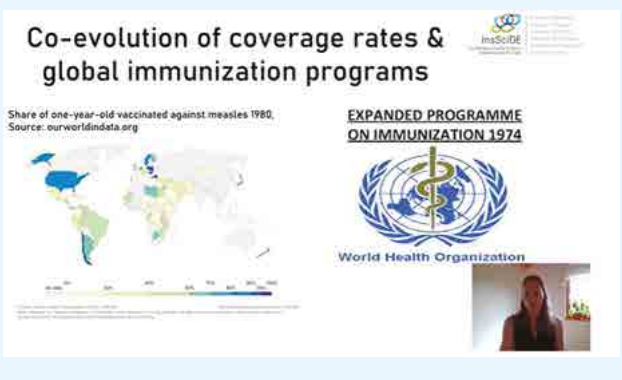
Datafication of diplomacy

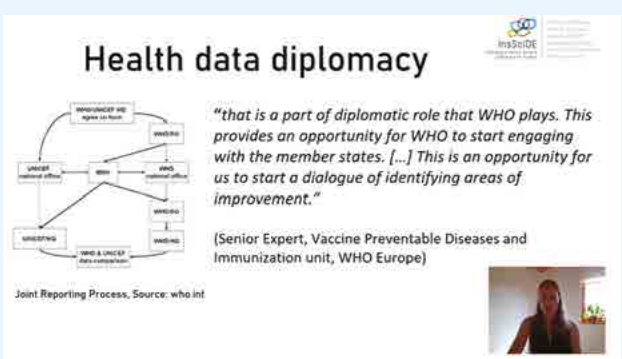
Implementing the JRF involved not only designing a data entry spreadsheet, but also creating the infrastructure's relational dimension: procedures and processes for WHO, UNICEF and member states to review and validate data. It is these processes that also foster diplomacy between WHO and member states' experts. Once states submit their JRF, WHO technical experts analyze the data provided and report back to each country. To refine their analysis they often ask for additional information as to local conditions which are not collected by the JRF, e.g. why coverage for a certain vaccine dropped, or why the target population increased substantially from one year to the next. WHO experts further advise member state actors on how to present and analyze the data. This includes advice on how to make use of the data to improve the national health system or on how to present data for evaluative processes, such as those conducted by the 'Regional Verification Commission for Measles and Rubella Elimination', an expert commission operating in the WHO European Region which provides certification for countries as measles free.

These interactions depend upon long-term relationships established between WHO public health experts and member state counterparts. Together they act here as health diplomats. When WHO experts push for more accuracy and better data quality, we find they do so with a political sensitivity resembling that of diplomats. They are quite aware that a change in technical standards or increased accuracy in data collection might produce significant consequences for member states: e.g. the loss of measles-free status or withdrawal of global donors' funding to the national health system following a drop in coverage rates.

The diplomacy observed here is informal, taking place on an everyday basis through routine data collection, analysis and sharing by technical experts. Data infrastructure like the JRF consists not only of excel sheets, standards, methods or indicators, but also a range of actors and practices. The JRF (infra)-structures diplomatic relations by enrolling a set of actors, ranging from national bodies to international and transnational organizations.

Our understanding of health diplomacy in the case of vaccination thus goes beyond the classical examples of neighboring countries providing financial support for immunization programs, the establishment of GAVI, or cease-fire negotiations in order to vaccinate (Hotez 2014). Data practices themselves, which can be considered diplomatic activities, become a means for but also shape health diplomacy.





Anna Pichelstorfer presents the study in an InsSciDE Warsaw Science Diplomacy School 2021 case video: www.science-diplomacy.eu/aiovg_videos/the-role-of-data-in-global-vaccination-governance

Conclusions: The politics of datafication

There have been substantial changes in the governance of global health in the past decade. New actors, new funding mechanisms as well as nationalism and the prevalence of geopolitical interests have not only challenged the recognition of the WHO as central authority but also call for global health diplomacy to negotiate processes and structures of global health. Our case study has pointed to the role of data in shaping international relations.

Part of the success of JRF was due to its transformation of a political problem into a seemingly technical one. In this practice of health diplomacy, the persistence of local idiosyncrasies in data collection is framed not as an issue to be resolved politically (for instance through amendment of the IHR), but rather as a "technical uncertainty" hindering "good data collection". The foregrounding of technicalities legitimizes and enables shared health diplomacy practices. But it also reduces political interventions on national immunization systems to seemingly technical exchanges between public health experts.

Data practices are indeed an intervention on member state practices, leading to a subtle alignment with WHO norms — not only of data production, but also of immunization. Furthermore, datafication can lead to a (re)distribution of power among stakeholders. Data practices lend legitimacy to the expert technical interventions by the WHO, but also to the WHO itself as a political authority.

Data practices and their infrastructures not only result from but also enable health diplomacy: the JRF shapes ongoing exchanges, mediates between local practices and global standards, and finally helps to make diplomatic relations more durable. We have shown that health diplomacy rests not only on carefully negotiated formal rules like the IHR determining how data and information should be shared, but also on routines developed between different levels of governance. Foreign policy officials play hardly a role in those everyday diplomatic practices of routine data production and sharing. It is rather epidemiologists and statisticians who act as diplomats and who, through seemingly technical exchanges of data, subtly contribute to an alignment of standards. Yet, in order to be successful such data infrastructure needs to be sensitive to local contexts, just as this new generation of health diplomats needs both technical and foreign policy skills to successfully collaborate. The shift to public health experts now acting as (data) diplomats has important political implications: they are much less accountable than are foreign policy actors appointed by elected officials.

Facing the diversity of delivery systems, vaccination schedules, and cultures of care and medicine, intergovernmental and supranational health diplomacy focused on developing cross-cutting data practices that could improve knowledge, health status and immunization governance. The seemingly technical focus, however, should not mask the power dimensions of the datafication of health diplomacy, such as providing the WHO with expert and political authority.

Data sharing became essential to rapid outbreak responses in the ongoing pandemic but still faces many barriers (LoTiempo et al. 2020). Further diplomatic negotiations between governments and non state actors will be needed about how to handle and share data during (future) global health emergencies.

Study Questions

• This case has centered on intergovernmental organizations. Could national-level diplomacy use data practices to enable and influence multilateral relationships?

• Could datafication be put to diplomatic use in domains beyond health, like technoscience and innovation diplomacy?

• What threat do illiberal regimes pose to open science and collaboration between scientists?

• Are there other examples, in health or in science diplomacy, of political problems being transformed into technical problems? Is there awareness that nonetheless, technical solutions influence political processes and outcomes?

• What lessons can be drawn from this case for future global health diplomacy addressing international data sharing, e.g. with regard to pandemic preparedness?

Endnote

A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See Pichelstorfer A, Paul KT (2022) Unpacking the role of metrics in global vaccination governance. International Political Sociology olab031. doi.org/10.1093/ips/olab031

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Blood Diplomacy:

Values and Standards in a Vital Public Health Infrastructure

An InsSciDE Case Study

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Human blood is essential for a vast range of therapeutic treatments, in the form of transfusions and the administration of medicinal blood products. The issue of blood safety is thus a preeminent public health issue, and national healthcare policy always seeks to ensure a pristine and secure blood supply. Blood safety is also the object of international and supranational collaborative efforts, interrelated with the governance of blood supply as a vital infrastructure. We examine the ethical values promoted in international cooperation around the circulation of human blood products and around setting common safety standards, and discern the interactions of an informal health diplomacy. The dynamic character of blood supply infrastructure manifests underlying tensions in the policy shaping processes, throwing light on the complex negotiations of blood diplomacy.

Image credit: World Health Organization

Keywords:
WHO, health diplomacy, blood donation, blood safety, risk, global health

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Blood Diplomacy:
Values and Standards in a Vital Public Health Infrastructure

Blood transfusion is a lifesaving medical procedure. Access to safe blood remains a challenge in terms of global health targets.

This case study addresses a preeminent public health issue, that of blood safety and blood availability. We focus on the ways international cooperation affected the governance of the blood supply, which is mainly under the remit of national healthcare policies. Through the examination of historical episodes in the postwar era, we will have the opportunity to attend to formal and informal processes, namely interactions between different public health actors and stakeholders, and to reconsider them through the lens of health diplomacy. By introducing the concept of blood diplomacy, we acknowledge the multivalent character of blood and direct attention to the goal of access to safe blood for every patient, in the context of universal access to healthcare.

Over the last 60 years, the blood supply infrastructure has been changing in response to challenges and risks as well as to new medical interventions and therapeutic treatments, asserting its importance for the operation of health systems and the delivery of healthcare. Through formal and informal health diplomacy interactions, we view the enhancement of blood safety through the implementation of norms, guidelines, and standards. Such policy-shaping processes, developed by public health officials, scientists and medical professionals, are the outcome of negotiations and may produce effects beyond their stated goals, for instance by raising the cost of blood and thus widening the gap between high- and low/middle- income countries. At a global level, blood safety and availability persist as an issue of concern and an object of global health diplomacy activities.

Blood supply: A vital infrastructure

Blood transfusion over the course of the 20th century gradually became a common lifesaving medical practice. The medical practice of transfusion today is part of a large and complex sociotechnical system, in which medical, technical, ethical and legal aspects are intertwined. It involves donors and patients, doctors and other medical and administrative personnel, hospitals, blood banks, and a range of instruments and technologies. Following the Second World War, large-scale blood services developed, most commonly under the provision of national health systems as part of the postwar welfare state. Blood is processed and separated into its various components, which are used for different therapeutic treatments.

With regard to the governance of the blood supply, a bifurcated system has emerged. National blood services are responsible for the collection and processing of blood, to be made available for medical use (transfusion) in hospitals. The plasma industry, which consists of commercial companies (part of the pharmaceutical industry) and not-for-profit organizations, develop medicinal products. The commercial plasma industry is global in scope.

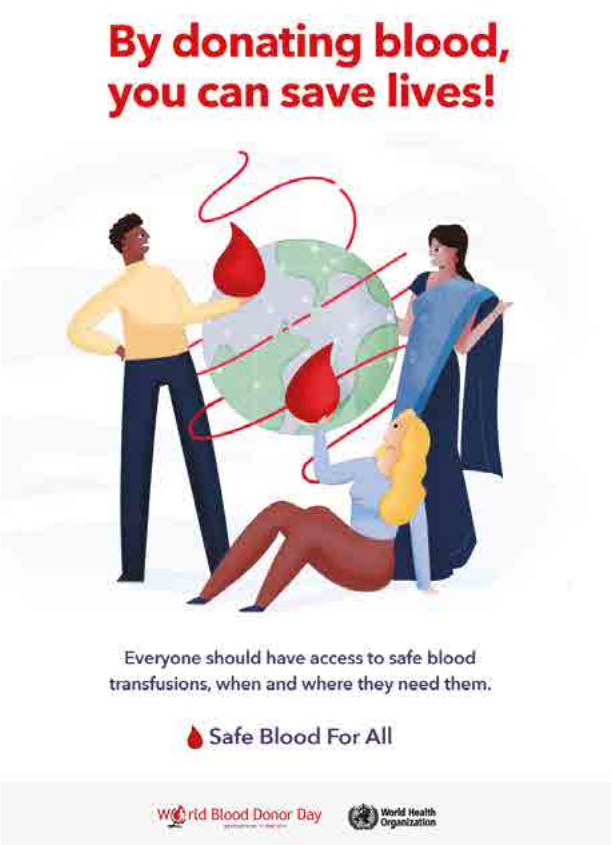

Image credit: WHO

Health diplomacy

During times of both war and peace, medical practice and public health policies formulated to deal with crises such as epidemics have long provided a space for international cooperation, inevitably linked with diplomacy in trade, economy and security. Science diplomacy and health diplomacy have more recently taken on explicit foreign policy relevance as global challenges are addressed through state co-operation and international relations.

Health diplomacy can refer to formal diplomatic processes (bilateral and multilateral), but also to informal ones (interactions between international public health actors and their counterparts in the field, including host country officials, nongovernmental organizations, private-sector companies, and the public) (Katz et al., 2011). "Global" health diplomacy emphasizes the worldwide nature of health challenges and the demand for social justice and universal access of all people to health services.

Improving global health, given the interdependent health challenges and the growing complexity in the governance landscape, renders health diplomacy activities crucial but also intricate, as they stand at the intersection of health and international relations. In this case, we discuss instances of formal and informal interactions of a range of public health actors to discern their outcome on blood safety.

Protagonists: Institutions and experts

The World Health Organization (WHO), the Council of Europe (CoE) and the European Union (EU) have played significant roles in the negotiation of blood safety norms and values. These intergovernmental institutions gather public health officials, experts and Member State representatives, including political authorities. A more broadly distributed category includes transfusion medicine professionals, public health experts, and their professional networks. Transfusion medicine professionals may have multiple, overlapping identities: they work in and manage blood establishments; they are professors/academics conducting research and teaching younger professionals, reproducing professional norms and standards; they may be policy advisors to state organizations/regulatory agencies, to international organizations, or to the industry. In these roles, they take part in formal and informal negotiations regarding the organization of the blood supply, and often these negotiations need to be reconciled for decisions to be made. Another salient group of actors has emerged to include those broadly called global health actors, being involved in developmental assistance programs (states, intergovernmental organizations, non-governmental organizations and foundations).

Tensions in the governance of the blood supply

Blood safety and availability constitute universal health targets. In the efforts to reach these targets, tensions arise. Given the complex transborder organization of the blood supply, the shared values associated with sourcing and use of human blood emerge as central stakes.

Public health actors, in their early collaborations, promoted ethical values associated with the use of blood, namely on the basis of a voluntary and non-remunerated donation, reflecting the principle of the non-commercialization of substances of human origin. The status of blood donation has been controversial, as it is connected to fundamental ethical, medical and social issues. The issue behind the question of donor compensation is whether blood should be viewed as a commercial commodity, or, as a gift, an act of altruism and social solidarity. It has been embedded in broader discussions about the commercialization of otherwise benevolent acts. Donor status is also connected to issues of safety. Research has shown that blood drawn from volunteer donors presents lower risk, while higher degrees of blood-borne infectious diseases are associated with paid donors.

However, as became more apparent after the 1970s, the bifurcated organization of the blood supply challenged these values. These ethical principles did not become compulsory, as they would have repercussions on the governance and supply of both not-for-profit national blood services and the for-profit plasma industry. While unpaid voluntary blood donation has become a core value of blood services (collecting blood for transfusion), it is also complemented with paid donations for the development of medicinal products.

Technical guidelines and standards have enhanced blood safety, but these should not be seen as independent of the basic ethical principles agreed, through tacit or explicit negotiations over the course of the past 60 years, to govern the blood supply. These basic principles furthermore direct attention not only to donors but also to the patients/recipients of blood products. And, importantly, the approach governing blood supply in the western countries has also effects on the quest of global access to safe blood.

Image credit: PAHO/WHO

The beginning of international cooperation at an institutional level

While the practice of blood transfusion was becoming more common, being discussed among medical practitioners in scientific fora (e.g. the International Society of Blood Transfusion, founded in 1935), it also became an object of more intense collaborations. The Council of Europe (CoE), from its foundation in 1949, promoted cooperation between Member States in the field of health. Its work in the field of blood transfusion in the 1950s promoted the principles of voluntary, non-remunerated blood donation, mutual assistance between states, optimal use of blood and blood components, and protection of donor and recipient. The first result of this cooperation was the adoption of the *European Agreement on the Exchange of Therapeutic Substances of Human Origin* (European Treaty Series, No. 026) in 1958.

Following the narrative by Bernard Genetet (1998), a prominent European transfusion medicine practitioner, the Agreement came after long negotiations and it was visionary. A dramatic event, the flooding in the Netherlands in 1953, made it clear that European solidarity expressed by sending blood to those in need was blocked due to incompatibility in blood bottles labeling. The following year, the Netherlands and French delegations argued to the Committee of experts on public health of CoE for the importance of standardizing blood products and enabling their shipment (through customs exemption) so that mutual assistance could materialize in case of extreme events. The two delegations also supported the non-commercial approach to dealing with blood, a substance of human origin. Despite the support to this proposal, it was not approved directly since the Member States had diverse arrangements in the nascent blood supply system. For instance, some collected blood from voluntary, unpaid donors while others from paid ones, under varied organizational and legal terms. Given these conditions, a draft to reconcile the different views was prepared by a group of specialists referring to the core ideals of European solidarity and of respect toward the donors, and incorporating a technical protocol to stimulate the harmonization of practices in the Member States. The Committee of Ministers (Ministers of Foreign Affairs) at a political level signed the Agreement in December 1958.

Given this pivotal moment, the health committee of the CoE continued to engage in studying the ethical, legal and organizational aspects of blood transfusion in connection to new scientific developments and changes in the field, by promoting scientific research and educational/training programs. On an ethical level, the Council's work promoted the non-commercialization of human blood as part of respect for human dignity. Outputs included three core agreements and numerous reports and recommendations. Although recommendations were not binding on Member States, they advanced cooperation and the setting of common standards, leading to greater access to safe blood. Such advanced scientific cooperation, as institutionalized in the context of the CoE, emerges as a model to respond to health challenges based on political support and on sharing common values, while providing informed guidance to national policy-making.

At the high level of the intergovernmental policy arena, another instance of multilateral agreement affecting the global governance of the blood supply emerged in the 1975 World Health Assembly of the WHO. In the 1970s, the debate over unpaid versus paid blood donation was ongoing, with many countries opting for a mixed system. At the same time, the commercial plasma industry was expanding, and for US plasma manufacturers the demand was also satisfied through international

trade in source plasma, collecting blood from poor populations to be processed into medicinal products accessed by patients in wealthier countries. Newspapers exposed that many collection sites were functioning in developing countries under questionable hygiene conditions, while high-risk donors were recruited by commercial banks. Such practices were vigorously condemned for being exploitative and medically unsound. With the initiative of public health officials at the International Red Cross and the WHO, a unanimous resolution was adopted in the 1975 World Health Assembly. According to the resolution, the WHO urged its Member States to "promote the development of national blood services based on voluntary non-remunerated donation of blood" and to "enact effective legislation governing the operation of blood services and to take other actions necessary to protect and promote the health of blood donors and of recipients of blood and blood products". From that time, the WHO provided assistance to states to build and strengthen their blood services by developing guidelines and standards, with a focus on low- and middle-income states that faced greater hurdles to do so.

Advancing blood safety in the post-HIV era

From the late 1970s, the pursuit of social solidarity and safety linked to the altruistic donation of blood achieved the status of an "international orthodoxy" (Bayer, 1999). Unpaid blood donation became a common practice in high-income countries, in which national blood services had developed to be a key infrastructure of health systems. While following the 1975 WHO resolution, commercial plasma collection sites in developing countries ceased operation, plasma collection was still based on a mixed system (from both paid and unpaid donations). Until today, plasma collection from paid donors continues, because of the need for large volumes of plasma for the production of medicinal products, based on the arrangements developed in the 1970s. Thus, in the process of setting standards and sharing common values, as invoked in the principle of the non-remunerated, voluntary blood donation, the bifurcated organization of the blood supply becomes apparent and transcends the distinction between the two as human blood flows in both sectors.

In the early 1980s, the public health emergency due to the emergence of a new disease, later named AIDS (acquired immunodeficiency syndrome) and associated with a retrovirus (HIV, human immunodeficiency virus), constituted a tremendous crisis that manifested in different ways in different countries. The fact that HIV could be transmitted by blood and that in the early years there had been cases of transmission by blood transfusion and blood products has had many repercussions. It affected blood donation, as unpaid volunteer blood donors were no longer a "guarantee" of blood safety. It also affected trust in national health authorities, charged for not acting effectively to prevent the crisis. Both sectors of the "blood industry" were in the spotlight after the HIV crisis, and questions about blood safety have persisted since then.

From the mid-1980s, the goal of blood safety became central. Many countries reorganized their blood transfusion services while there has been an upsurge in the adoption of norms, standards, guidelines and recommendations. At the WHO and the Council of Europe committees, public health officials together with Member State representatives collaborated and issued recommendations regarding blood processing and testing to assist national services to deal with the risk of transfusion-transmitted infections. Increased oversight, strict guidelines and good manufacturing practices were also imposed on the commercial plasma industry. The safety of the blood supply gradually increased to a great degree, after many interventions in the field including the adoption of blood screening technologies and more stringent blood donor criteria.

In the post-HIV era, the risk governance of the blood services became a priority to meet the public and political expectations of reducing the risk of HIV infection through transfusion, even by targeting the elusive goal of zero-risk. This approach privileged a focus on "blood safety" by directing attention to interventions dealing with "blood" as a "product" (blood to be transfused), rather than to the overall process quality. Its effects included the allocation of resources to technology-based solutions instead of implementing holistic approaches to advance "transfusion safety" (with an additional focus on the use of blood, hospital practices, and patients therapy), generating questions for its effects in terms of health outcome.

The European Blood Alliance (EBA)website includes an interactive map to find information about national bloodbanks and blood safety activities in EU Member States and other countries. Image credit: Courtesy of EBA, europeanbloodalliance.eu

European collaboration: The interplay of values and standard-setting

Amidst these complex and challenging conditions, international collaboration intensified in an effort to restore public trust. For the Council of Europe, a top-down initiative was to address the general public by publishing a white paper to analyze the "complicated implications—ethical and economic, social and medical—of transfusion" (Hagen, 1993). At the same time, the cooperation of transfusion medicine specialists deepened in the respective expert committees through developing common standards for the European area. A significant outcome for the field of blood transfusion was the Recommendation No. R (95) 15 of the Committee of Ministers to member states on the preparation, use and quality assurance of blood components, issued in 1995. It contained guidelines on the preparation, use and quality assurance of blood components as a technical appendix, and became the key document for setting technical standards for blood quality and safety in Europe. This guide has been considered to be of great use to practitioners in blood banks, health personnel, legislators and public health officials working in the field (following the first edition, it is regularly updated; the twentieth edition came out in 2020).

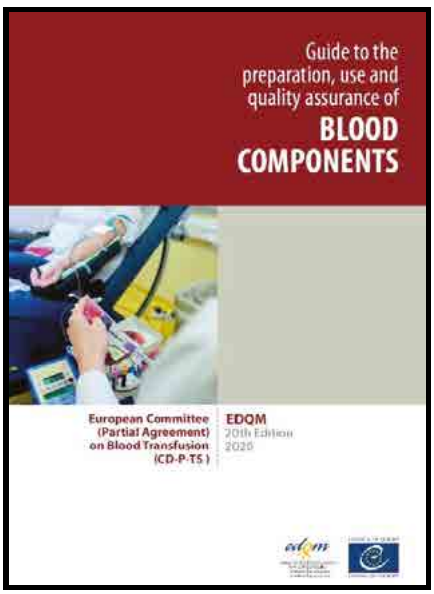

Image credit: European Directorate for the Quality of Medicines & HealthCare (EDQM)

Another instance of health diplomacy may be found in parallel with efforts for a broader European integration in the support toward countries of Eastern and Central Europe since the 1990s. The work of the Council of Europe was extended to those countries to support their national blood services – while extending its normative influence – and to encourage voluntary, unremunerated donation, self-sufficiency and quality assurance, to reach the level of the other Member States. Such projects were part of wider initiatives to support the health of the populations in countries experiencing major transformations and were supported by the European Commission and the regional office of the WHO. The role of public health officials and the building of networks of transfusion medicine professionals were pivotal, being enabled by political support by the intergovernmental organizations and Member States.

In the context of the European Union's (EU) health policy, legislation to promote blood safety was adopted in 2003. Following a complex legislative process within the institutions of the EU, the Directive 2002/98/EC, known as the Blood Directive, set (minimum) standards of quality and safety for the collection, testing, processing, storage and distribution of human blood and blood components in the EU Member States. The technical requirements put forward were largely based on the "Guide" of the Council of Europe. The Blood Directive is the first example of legally binding supranational regulation in the field, although it did not deal with the medical use of blood, which was explicitly excluded. The political agenda of the EU, formulated in the aftermath of the HIV blood contamination episodes in Member States, prioritized risk management on blood sourcing and supply (Farrell, 2012). Regarding the longstanding issue of the status of the blood donor, the Directive stated, in non-legally binding form, that "Member States should take measures to promote community self-sufficiency in human blood or blood components and to encourage voluntary unpaid donations." It indicated that the efforts of the Council of Europe in this domain should be supported.

The Directive provided flexibility in blood sourcing as a result of compromises between the various actors in the blood supply and the differing nationally established settings. While it regulated blood and blood components at EU level for the first time, its provisions did not cover all parts of the blood transfusion chain, meaning that it did not adopt a "vein-to-vein" approach that would deal with the clinical practice of transfusion medicine and focus on the patient-recipient. The chance was missed to enshrine voluntary, non-remunerated blood donation in European legislation and to boost European self-sufficiency based on voluntary and non-remunerated donations (Faber 2004, p. 271). For transfusion medicine professionals in Europe, this aim remains. "Both for blood safety and ethical reasons, all labile blood components should come from voluntary non-remunerated donors" (EBA, 2016).

Challenges in the governance of the global blood supply

The dynamics in the governance of the blood supply show that diplomacy for humanistic end-values and for improving both local and global health outcomes does not necessarily align with technical solutions. The standard-setting processes and technology-based approaches entrenched in governance of the blood supply in the post-HIV era were compatible (and reinforced by) its bifurcated organization. While public health actors interrelate with multi-stakeholders, the endeavor to achieve health objectives is politicized and has diverse consequences. According to a transfusion medicine specialist, the focus on technological interventions to reach the elusive goal of "zero risk" in the developed world might impede efforts to enhance blood safety globally, by consuming resources that could be directed to international aid for establishing realistic standards to be followed also in developing countries (Farrugia 2002).

"Blood safety... for too few" was the title of the WHO press release on the World Health Day on 7 April 2000, directing attention to the persisting inequalities in accessing safe blood and calling for urgent actions. In the past two decades, programs of international development assistance aiming at promoting global health included activities to increase the availability of safe blood in low- and middle-income countries. Recent critics argue that the conditions placed on aid programs utilize standard practices from wealthy countries that do not translate to the developing world. Practices like centralizing the blood services and using only unpaid volunteer donors could create barriers that increase the cost of a unit of blood and would lead to long-term reliance on external funding. This approach would negatively affect the sustainability of already fragile national health systems, especially in low-income countries. In addition, these countries often cannot sustain access to consumables, diagnostics and medical devices for their infrastructures to operate. As these processes involve power relations and diverse interests, there is a need for diplomatic coordination to counteract the fragmentation of aid programs and to reconsider the local needs against the assumed catholicity of standards.

Image credit: WHO

Conclusions

During the COVID-19 pandemic, the crucial role of infrastructures in dealing with health challenges became once again apparent. This has been true whether it is about testing infrastructure to detect the virus in the human body and communities, accessibility of vaccines and logistics infrastructure for their rollout, and surveillance infrastructure. This case study explored the dynamic character of the blood supply as infrastructure in order to contextualize international/supranational initiatives and policies. We came across tensions in sharing and enacting common values, such as the debate over voluntary unpaid versus paid blood donation. We also followed the processes that led to advanced collaborations targeting the enhancement of blood safety.

We attempted to discern formal and informal processes of health diplomacy during the interactions between international public health actors in order to depict a broader picture of blood safety policy making. We paid attention to the interrelation of multi-stakeholders and a variety of public health actors in the processes of adopting norms and guidelines as well as developing blood safety standards. Considering these processes, we pointed to the importance of advancing international scientific cooperation through its institutionalization and underlined its effects in advancing blood safety.

Lastly, we propose that a focus on blood diplomacy could direct attention to the humanistic values governing the utilization of blood, a human biological material, and the social value of promoting health. The stated objective of health diplomacy to respond to health challenges addresses the long-standing inequalities in accessing safe blood at a global level. Building and supporting sustainable blood supply infrastructure in middle- and low-income countries is hampered without attention to the local conditions and needs. A focus on blood diplomacy could raise awareness for diplomatic coordination to counteract the fragmentation of aid programs toward universal access to safe blood.

Study Questions

• How can health diplomacy deal with the tensions between ethical values and technical norms in the promotion of voluntary unpaid blood donation?

• Institutionalized collaboration of medical professionals and public health actors can lead to improved health outcomes, and scientific negotiations have strengthened national infrastructures. How can scientific negotiations be better "translated" to diplomatic language?

• Foreign policy strategies reformulate in response to global tensions. In what ways can humanitarian imperatives remain relevant over the long period needed to build sustainable blood services, and to address health challenges more broadly?

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Endnotes

• A fuller version of this InsSciDE work will be forthcoming in a peer-reviewed journal.
Vlantoni K (in preparation) 'Blood diplomacy': Standards and values in vital infrastructures.

• Cover image: WHO provides advocacy materials to promote World Blood Donor Day, June 14. Source: www.who.int/campaigns/world-blood-donor-day/2019/

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(with Kandaraki A, Pavli A) (2017) Medical technologies and health policies in post WWII Greece. In Inkster I (ed) History of technology, vol 33. Bloomsbury, London, pp 107-133.

Natural Resources and Biodiversity as Global Public Goods

The Science Diplomacy of French Natural Substance Chemists

An InsSciDE Case Study

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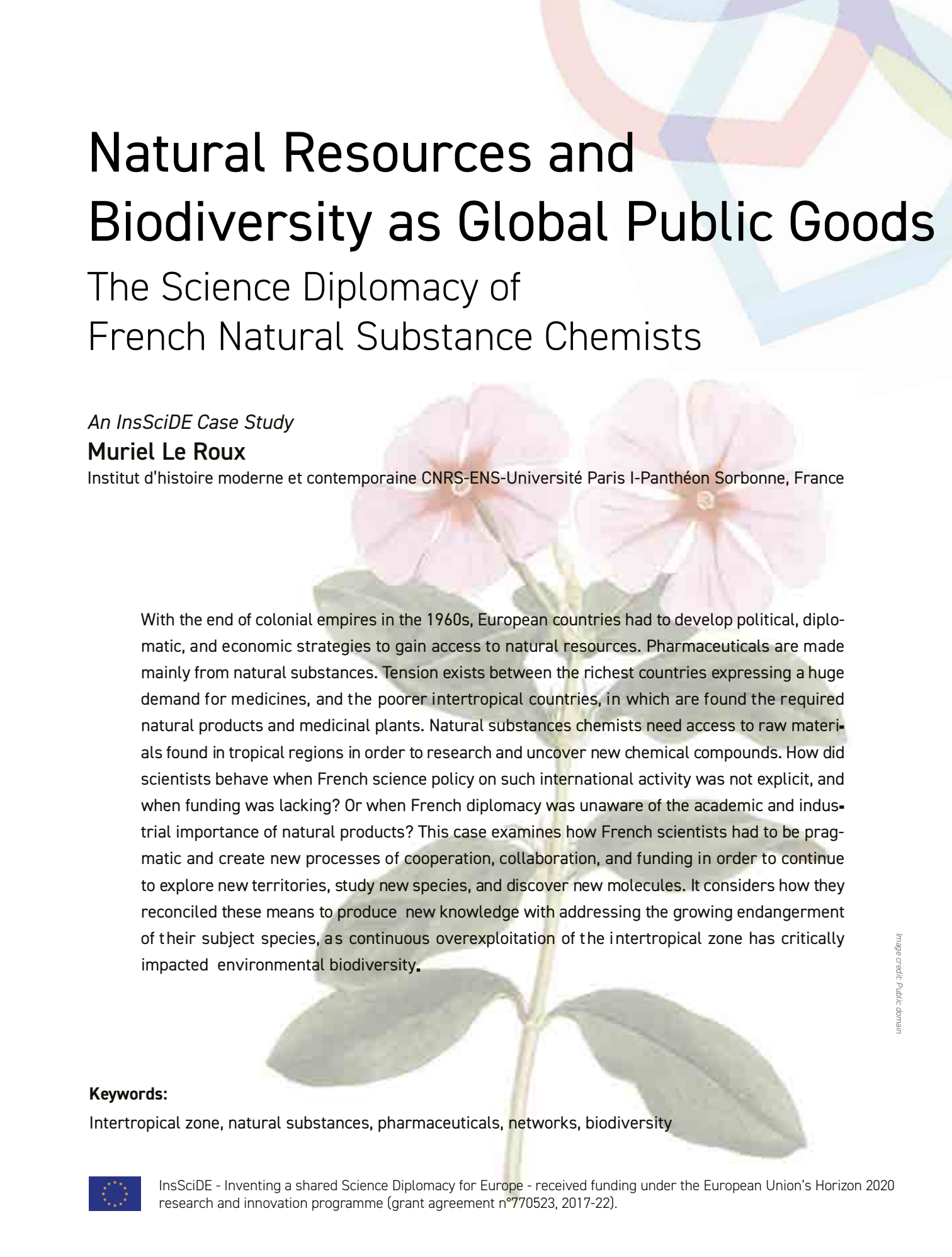
With the end of colonial empires in the 1960s, European countries had to develop political, diplomatic, and economic strategies to gain access to natural resources. Pharmaceuticals are made mainly from natural substances. Tension exists between the richest countries expressing a huge demand for medicines, and the poorer intertropical countries, in which are found the required natural products and medicinal plants. Natural substances chemists need access to raw materials found in tropical regions in order to research and uncover new chemical compounds. How did scientists behave when French science policy on such international activity was not explicit, and when funding was lacking? Or when French diplomacy was unaware of the academic and industrial importance of natural products? This case examines how French scientists had to be pragmatic and create new processes of cooperation, collaboration, and funding in order to continue to explore new territories, study new species, and discover new molecules. It considers how they reconciled these means to produce new knowledge with addressing the growing endangerment of their subject species, as continuous overexploitation of the intertropical zone has critically impacted environmental biodiversity.



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Keywords:
Intertropical zone, natural substances, pharmaceuticals, networks, biodiversity

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Natural Resources and Biodiversity as Global Public Goods:
The Science Diplomacy of French Natural Substance Chemists

While balancing ethical concerns as well as societal and global pressures for new medicines, how have French researchers in the intertropical zone built partnerships that became part of French and then European diplomacy over time? Independent in the 1960s of foreign policy processes, field researchers became stakeholders in the diplomacy of the 1980s-2010s. This case study traces how, in the past 60 years, scientists at the French National Centre for Scientific Research (CNRS) Institute for Natural Substances Chemistry (ICSN) moved from a paradigm of sampling natural goods to one of international cooperation in the management of plants and of training through co-research. Today we are witnessing a new mistrust on the part of some scientists because of the growing destruction of biodiversity and the proximity of multinational companies to diplomatic networks. How did researchers become whistle-blowers?

From a medical point of view, the intertropical zone has long been considered to be of great value because "a large part of the plant species are unknown and they provide natural substances from the fauna and flora" (Potier 2001). Science for a long time could not provide pharmaceuticals that could be synthesized without the use of natural products. Biology, genetics, and chemistry have only recently provided synthetic medical treatments for the major diseases of our time and even today, synthetic products are very often more expensive than products based on substances extracted from medicinal plants.

At the beginning of the 1960s, the two former colonial powers of the United Kingdom and France had to give up their empires and with them, their extractivist prerogatives. They no longer had access to the extremely rich raw materials and natural products present in the intertropical zone. French academic research departments had to deploy strategies to gain access to these rich areas in order to be at the forefront of fundamental and applied disciplinary fields such as natural substances chemistry, biology, and biogenetics. The prizes were knowledge, products, and international prestige both academically and industrially (for pharmaceutical companies in particular). These zones were over-exploited during colonial periods and continue to be so today, in part due to the principle of self-determination and the legitimate aspirations of intertropical peoples to control their living and mineral resources.

Stakes: A narrative based on archives, and a new view on science-based diplomacy

The history of science, through its method and focus on analysis over a long period of time, provides a critical analysis that gives diplomats new ways of viewing contemporary facts. Our case study underlines the complexity that has prevailed for more than fifty years underlying the emergence of a diplomacy based on science. Our sources are archives, unpublished literature, testimonies, and interviews.

This longue-durée approach allows us to understand how French field scientists, ethnobotanists, and natural substance chemists produced reliable knowledge that led to the discovery of medicines. This case examines specific collaborative strategies deployed on the ground in Madagascar, Malaysia, and Uganda based on co-generating knowledge with local researchers and thereby gaining access to raw materials. French scientists created partnerships in a process that can be described as a form of science diplomacy.

The independence and autonomy of researchers is the prerequisite for obtaining scientific results. These two conditions allow an objectification of data that make researchers valuable partners for diplomats dealing with biodiversity issues.

From their very first missions overseas, the scientists of our case witnessed irreversible destruction, the main cause of which was overexploitation for national and, above all, international economic purposes. Despite their role in international arenas, their cooperation with national, binational and European research programs, researchers became whistleblowers in the face of the collapse of biodiversity. They have contributed both knowledge and action to address the international issues that arise around natural resources, which are sometimes seen as a common good but often as resources to be exploited indiscriminately.

Critical analysis of the archives for an objective account of the facts

Why do field scientists today express a renewed distrust of diplomats and transnational organizations? Opening the archives to know and restore the exact nature of the relations between science and diplomacy offers a new vision of the scientific as well as political and economic stakes.

The critical analysis of these archives permits the reconstruction of the context in which decisions were taken. It allows us to understand the choices made by scientists, who were sometimes opposed to any proximity with political leaders – and sometimes cooperated with diplomats and industrialists alike.

It appears that, independently of science policy decided by government, researchers have been able to combine diplomatic imperatives with the need to find public and private funding in order to discover new drugs. Their archives show that they were fully aware of the contradictory logic within which they had to operate.

Reading these archives deconstructs some previous notions about science/diplomacy relations. We found that researchers are reflexive observers, who are aware of the issues raised by their work. They are conscious of the risks of instrumentalization to which they are subject. They are pragmatic and produce reliable data that is co-constructed within their international community, while at the same time they are involved actors and mediators on the ground.

Tropical natural common goods for a shared global health

Antarctica is not the only great space needing international attention and governance. Local spaces under the power of national and local governments need it too. The environment of the intertropical zone is very delicate mainly due to over-exploitation during colonial periods and ongoing economic activities (industrial, touristic, etc.) since their independence. A tension arises between peoples' need to exploit local resources to reach a level of decent quality of life, and the objective of conservation for humankind and future generations. Similarly, questions of national sovereignty are juxtaposed with (perhaps Eurocentric) visions of a new governance mixing international, national and local bodies to administratively oversee these fragile areas for the benefit of all. In this sense, recounting the history of researchers' field practices and their attitudes towards supervisory authorities (research centers, governments, funding agencies, diplomats, etc.) can help pinpoint the interests of the various stakeholders and illuminate issues that might be tabled – or merely implicit – in future diplomatic negotiations.

The Institute for Natural Substances Chemistry

The ICSN, part of the French national research network CNRS, is home to a community of academic researchers with a dual mission: to increase knowledge and to produce new active molecules. It is in this academic laboratory that two anti-cancer drugs based on natural products, Navelbine and Taxotere, were discovered in the 1980s and 1990s, respectively.
In order to do their job, the chemists of ICSN needed raw materials from the intertropical zone. Access to countries having the flora or the fauna could be obtained via three paths: a personal route via networks built by themselves, the official route via the CNRS and the Foreign Affairs or Economy Ministries, or a mixed route.

Science policies at both the French and European levels were slow to emerge and become structured. Priority was given to nuclear, aeronautics, and aerospace fields, leaving both great freedom and reduced financial resources to other research sectors. In this context, ICSN principal investigators in the 1960s were free to choose which topic to study and were allowed to fund their research however they could, including through partnerships with industry on top of their state grants. They oversaw field researchers whose task it was to develop cooperation with colleagues located in environmental hot spots such as Madagascar, Malaysia, Vietnam, Uganda, and other countries – often implying the invention of new ways of working and collaborating, with the added dimension of overseas distance.

Book and herbarium plate for Catharanthus roseus by Sieur de Flacourt. Photo credits: Lucile Allorge, National Museum of Natural History - Paris

Research pragmatism: When lack of means rhymes with autonomy and freedom of action

During the period under study, scientific competition became very intense across the board and led to the formation of highly specialized global scientific communities. For the natural substance chemistry community, a diminished level of funding would result in the financing of pharmaceutical research and development by the private sector.

The worldwide rush to discover new active molecules to produce and patent new pharmaceuticals gained political and economic legitimacy after the Nixon administration's cancer plan was issued in 1971. Given the lack of public funding, the ICSN's everyday research practices became very pragmatic. Research team leaders chose their research topics and produced fundamental knowledge in full academic independence. At the same time, they consciously deployed strategies to attract industrial sponsorship. Partnership contracts, signed by researchers themselves, stipulated that the industrialists had to pay for raw material supplies, and for field expeditions to inventory local flora and fauna or to discover new species. Researchers and industrialists were joint owners of any patents and shared royalties. While this funding approach was not an official policy of the CNRS, it was tolerated.

Scientists were accustomed to intellectual independence; for the French research community, the state both funds and guarantees academic freedom. There was no contradiction in benefiting from state funding for equipment and employment, rejecting top-down topical directives, and fiercely defending the open-ended character of research. This professional culture was very dominant until the 1990s. On the other hand, turning to private sponsorship was felt to have its risks. Cooperation with industrialists could be interpreted by academic peers as compromising. Being too close to state agents deployed in diplomatic roles could have been seen as suspicious. Yet cooperation was needed with both industrialists and with diplomats for material and in-kind support in order to pursue research programs on the ground.

In the absence of a precise French scientific policy in the field of natural substances, in the absence of European diplomacy and cooperation, and in the presence of a French diplomacy that was little interested or aware of the importance of this academic and industrial sector, the ICSN scientists and their associates came up with pragmatic new ways of working, cooperating, and collaborating.

Protagonists

Among a wide range of actors, the protagonists of this story were French researchers, chemists, ethnobotanists and those of the partner countries, industrialists and, finally, diplomats.

Four researchers stand out:

- Pierre Boiteau, the militant (in the political sense of the term);
- Pierre Potier, his boss, the *de facto* diplomat-negotiator;
- Thierry Sévenet, the field scientific advisor;
- Sabrina Krief, the whistleblower.

Pragmatism and reciprocity: Researchers' tools of diplomacy

Pierre Boiteau, an ethnobotanist and director of the vegetal identification laboratory at ICSN-CNRS (1968-1980), was a Communist party member and elected councilor (1949-1958) to the Assembly of the French Union (Fourth Republic). He defended the social rights of the Malagasy people, seeking to preserve flora and fauna from destruction due to overexploitation. This militant action caused difficulties for him with the French colonial government, and although he remained a CNRS researcher, he was forced to leave Madagascar.

1982 commemorative stamp of Pierre Boiteau (1911-1980) highlighting his support for Malagasy Independence. Source: Malagasy Post Office.

Pierre Potier, pharmacist, chemist and director of the ICSN, sent Boiteau back to Madagascar after it achieved independence in June 1960. French diplomacy needed scientists to maintain relations, and scientists needed Malagasy dry plants to pursue their investigations. Thanks to Boiteau's extensive knowledge of Madagascar's social, cultural, and economic issues, not to mention the Malagasy language, Boiteau and Potier were able to initiate a scientific cooperation with the new government. Malagasy doctoral candidates received training in France at the ICSN and Malagasy university professors were granted residence; in return, a permanent French university research team was set up in Madagascar.

Pierre Potier (1934-2006). Photo credit: © Mme Christiane Marmonteil, https://id.erudit.org/iderudit/013180ar

Boiteau's scientific knowledge and network resulted in France's adaptation of its relations with the independent nation's government as well as increased influence in the Indian Ocean countries. French diplomatic relations were re-established thanks to this new type of academic reciprocity conceived by Potier and promoted by Boiteau. The commitment shown by Boiteau confirms that ethnobotanists and natural substances chemists began to express social responsibility long before the Stockholm UN conference in 1972 and outside the circles of that organization.

Thanks to the independence of researchers, science is dynamic and ahead of national policies and international diplomacy. It is the researchers who were the precursors of an original strain of diplomacy that emerged in the late 1960s and 1970s, affecting both arrangements on the ground and policy options at national level. A triangular cooperation took place between scientists and the Malagasy government on the one hand, and scientists and the French government on the other hand – and in between, less bilateral and more international relations with new actors in the region such as the Soviets, Europeans, and Americans.

Potier initiated and maintained this type of cooperation, first informally and then formally. Institutionalizing exchanges was a way of protecting scientific work from being used by unscrupulous industrialists. Hosting researchers from emerging countries consolidated access to natural resources and the supply of raw materials to the laboratory. The sharing of knowledge and training through research performed by foreign students reinforced sustainability, since on their return they favored relations with their French laboratory.

Thierry Sévenet, pharmacist and physicist, ICSN research group director. Uganda, mid-2000s. Photo (undated): Françoise Guéritte.

Thierry Sévenet, research group director, replicated the ICSN model for cooperation. Sévenet traveled to tropical countries on Potier's request (the French overseas territory of New Caledonia, and Malaysia, Vietnam, and Uganda) and to Morocco. The same principles were deployed: first, write to the French Embassy scientific adviser to secure funding for an expedition; next, negotiate an agreement between universities; then top up funding from both the scientific bureau of the French Embassy and ICSN royalties drawn from Navelbine and Taxotere. Local researchers were listed as co-authors on publications and patent applications. Grants for students to complete their thesis in France were funded by the French Embassy and the ICSN. Knowledge transfer and cooperation were to continue following the return of the newly minted PhD holders to their country. While French diplomats were not at the origin of this procedure, they were involved and helpful. Indeed their diplomatic action would be enriched and expanded, as they were exposed to "green arguments" heard in the context of scientific and personal cooperation.

Dr. Jane Namukobe (left) and members of her phytochemical research team, Makarere University, Uganda, 2021; she has cooperated on natural substances field and laboratory research with ICSN. Photo courtesy of Dr. Namukobe.

Biodiversity protection: The cooperation model integrates more state action

Driven by a universalist vision of science, the ICSN science diplomacy for research and training was directed towards both ensuring the material means to work, and contributing to a collective awareness of the fragility of the environment.

The ICSN archives show an evolution of views on biodiversity threats and protection. In the oldest archives, it is written that irreversibly endangered species must be inventoried and analyzed. Then, during the 1980s researchers denounced the deforestation of Malaysia and Vietnam for the benefit of multinational companies. A new paradigm emerged. French scientists, aware of the irreversible losses, were looking for a way to limit the destruction of Malagasy, Malaysian or Ugandan natural resources resulting from overexploitation by local and multinational firms as well as by the local population. This implied changes to the way they dealt with the material issues necessary to develop a research program: because they needed more resources, they needed access to an international forum. They approached French and, in the case of Uganda, both French and European diplomats. In this context of biodiversity conservation and defense, the archives suggest a shift from pragmatic diplomacy led by researchers, to a request for help that would lead to a new process for cooperation in which the state is asked to take an active role. Natural product exchanges would gradually become co-constructed by European diplomats and scientists as matters of health and science diplomacy with countries outside Europe.

In the early 2000s, Sabrina Krief arrived in Uganda to complete her doctorate on the biological and chemical effects of plants and other substances selected and consumed by great apes. The cooperation pattern was classical. The expeditions were organized by CNRS and the French National Museum of Natural History (MNHN), drawing on scientists' personal networks, with no specific involvement of French diplomatic agents except, at the beginning, for security matters.

However, because of the environment's wealth and extreme fragility, the scientists moved to place research programs under agreements protecting natural resources from greedy exploitation. At the time, government objectives under President Yoweri Museveni were, for international and economic issues, in line with the 1992 Rio Conference Declaration on Environment and Development. Laws were voted to control natural resource exploitation, whether for academic or economic-industrialist purposes. A cooperation agreement drawn up with the help of the French Embassy and signed by the CEOs of three organizations (CNRS, MNHN and Uganda's Makerere University) helped to protect the research zones from the aggressive Chinese extractivist presence across Africa that had increased dramatically in Uganda, degrading research conditions for the French scientists and their counterparts.

Sabrina Krief, primatologist, whistleblower. Uganda, mid-2000s. Photo (undated): Françoise Guéritte

The new generation of researchers was influenced by paradigms arising from international biodiversity conferences, legitimating new international scientific activism for a global governance of endangered areas. While rooted in previous models, the Ugandan research relationships drew on the principles of international cooperation affirmed in the Rio and Nagoya Conventions. It was becoming urgent to find a sustainable way to protect the primates whose habitat was regularly being destroyed. Researchers would draw on all means available to them. Sabrina Krief led researchers in cooperating with non governmental organizations (NGOs), fostering the creation of local NGOs with or without the help of the Ugandan govern-

ment, and mobilizing French and European diplomats. Very aware of Chinese soft power that enabled companies to penetrate environmental hotspots, the researchers became closer to French and European diplomats in order to support both their research and the protection of endangered areas. However, they remained discreet about such cooperation, as it could be seen by the rest of the scientific community as a compromise with neo-colonial power.

The rapprochement with diplomats was coupled with aid granted by French multinational companies. Companies with activities in Uganda were well aware of the requirements of international conventions and, moreover, were exposed to the pressure exerted by European public opinion mobilized by researchers like Krief. They developed charters, which they published and undertook to respect. They therefore had a definite interest in supporting scientists' research and environmental protection programs. Although in popular perception cooperation with an industrialist can be seen as an attack on the environment, nonetheless such partnerships proved to be effective, in that multinational companies have to think about their reputation before making any decision. The cooperation between these French companies and researchers can be called virtuous. Moreover, the use by these firms of the best international experts, gathered in independent scientific councils, facilitated the production of data that no purely academic research program could have funded.

Initiated in 1982 by Dr Thierry Sévenet (ICSN-CNRS, right) and Prof. K. C. Chan (University of Malaysia UM, Malaysia, seated center), collaboration led in 2015 to the signature of an agreement for a joint endeavor, the international French Malaysian Natural Product Laboratory. Photo credit: ICSN.

Conclusions

Today, any researcher may be mobilized to serve the science diplomacy of his or her country or of the EU. To understand the issues at stake in this diplomacy, it is necessary to keep in mind different scales of analysis, from local to global, and scrutinize the role and interest of different actors at each level. For instance, what is public and published by companies is a matter of reputation preservation as well as of corporate social responsibility.

By re-examining the way chemists organized their research conditions over the long term, we can see how they prepared their ground missions and how relationship-making evolved. We thus approach the materiality, often invisible in historiography, of professional practices. Reading through the ICSN archives and interviewing witnesses shed light on the researchers' anticipation of, and adaptation to, political and economic constraints. We saw a community aware of their instrumentalization by certain organizations or powers, and saw their lucid processes to advance their own goals. They found themselves having to deal with the desire for discovery (new species, new molecules, new medicines), and with the duty to warn and protect sensitive areas, including against the economic practices of local populations which may appear justified in a short-term perspective but are unsustainable. They have to cooperate with politicians, whom they know are not totally transparent, and sign agreements with industrialists, whose interests may diverge but without whom they may have no financial support. In this way, a complex image emerges of research that exists only because it is based on alliances, often transnational and transcultural: chemists/ethnobotanists, chemists/industrialists, scientists and diplomats.

Study Questions

• Which goals and priorities were served by the French scientists' diplomatic moves? What do you think of the role played by personal research networks and cooperative arrangements in attaining these goals?

• Why is it so complicated for politicians or diplomats to read/use researchers' works?

• Could scientists contribute to the emergence of a more virtuous diplomacy that considers the sustainability of resources beyond immediate national/economic interests?

Endnotes

• A fuller version of this InsSciDE work is forthcoming. Le Roux (in press, 2022) La biodiversité, source de médicaments: entre compétition et éthique quelle place pour les chercheurs? In Les cahiers du Comité pour l'histoire de l'Inserm.

• Cover image: Madagascar Periwinkle (Cantharanthus roseus), used by Potier to develop anticancer medication. Public domain.

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Dealing with the Plague in Porto, 1899

Building a European Health Diplomacy: A Comprehensive Approach

An InsSciDE Case Study

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In July 1899, the plague raged in the Atlantic city of Porto. From the very start, the crisis was global. The plague had been appearing for several years in various world regions. An outbreak three years earlier in Mumbai had caused international concern, suggesting that Europe could be affected next and leading to an International Sanitary Conference held in Venice in 1897. Porto was the first European port to be hit by the plague at epidemic scale. Portugal was criticized for failing to apply preventive measures in the spirit of the Venice Convention. But this international and diplomatic outcry did not prevent scientific cooperation to combat the plague on the ground.

Porto is an emblematic local case of the control of epidemics, unfolding during the first contemporary globalization that took off during the 1870s. Can one speak of the existence of European health diplomacy at that time? In this perspective, does the compartmentalization of approaches by "scientific" and "diplomatic" actors, interests, or communities make any sense?

The story of Porto reveals, at different spatial and temporal scales of epidemic risk management, the various advantages of diplomatic policies and practices to strengthen European health diplomacy in a globalized world.

Image credit: Pasteur Institute Nha Trang

Keywords:

Europe, plague, global health diplomacy, stakeholders, governance

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Dealing with the Plague in Porto, 1899

Building a European Health Diplomacy, a Comprehensive Approach

Early in July 1899, the plague broke out in Porto. A few weeks later, a military cordon sanitaire surrounded the port city. Trade relations were interrupted; panic reigned in the Portuguese city. The management of the crisis by the national authorities was fiercely criticized on the international scene. Yet Europe had been confronted with a cholera invasion only a few years earlier, and international health conferences had contributed to building up international regulation. Could there be any feedback from an epidemic to another? Could diplomacy and international scientific cooperation respond to this new crisis? And what image of "Europe" emerged in the context of that global epidemic crisis?

In 1896, when the epidemic plague reached Mumbai, a key node of global human and commercial circulation, the emotion was international. The plague's path to Europe was open. An International Sanitary Conference was held in Venice in 1897 gathering the national representatives of 23 countries, mostly European. The delegations—composed of consular and diplomatic agents, physicians and specialists of public hygiene—worked out an international health regulation in order to preserve both public health and the trade interests that were threatened by strict quarantine measures. Two years later, Porto was the first seaport in Europe to be hit by the disease in epidemic form.

In 1899, Portugal's health and political authorities were severely criticized for implementing public hygiene measures considered already by the Venice Convention to be entirely outdated. Nonetheless, international cooperation converged in Porto to fight the epidemic on the ground. Several foreign scientific missions formed an *ad hoc* international commission. Albert Calmette, one of the most important protagonists of the famous Pasteur Institute, was on the scene and developed a particular serum that was supposed to prevent and to cure the plague.

The international cooperation carried out in Porto was multi-level. At first glance, one could perceive this cooperation as a stratification: state diplomacy for normative cooperation, overlaying scientific and operational cooperation on the ground. But, studying the management of the plague epidemic in Porto is the opportunity to examine the encounter between diplomatic and scientific actors and the juxtaposition of politics and public health measures. We take a comprehensive view through the lens of French diplomacy and stakeholders dealing with the plague issues in Porto. It allows us to see into the heart of the "diplomatic machine" or apparatus – the chancellery and its networks – and to highlight the different scales at which diplomacy took place to deal with this major outbreak occurring in Europe.

In this case study we will seek to distinguish European diplomacy within international cooperation, and examine the balance that existed between scientific research, innovation and diplomacy. We will attempt to identify the place of Europe in the early days of globalization, and identify the meaning(s) of 'Europe' in this context. We will consider knowledge about the plague, the construction of international health regulation and the international cooperation on the ground. This comprehensive approach, between local, national, and global flows is required to understand the decision-making processes and the path in which an Epidemic/ Health Diplomacy was built, especially at European scale.

Health diplomacy: Its origins in the first International Sanitary Conference of 1851

In the mid-19th century, growing awareness in Europe of a global epidemic risk went hand in hand with the development of international health cooperation. The first "International Sanitary Conference" was held in Paris, 1851, bringing together delegates from twelve states, consular and diplomatic agents, doctors and public health specialists, with the aim to harmonize prophylactic systems (preventive rules and measures such as quarantine, disinfection...) in the Mediterranean area and then to organize the fight against diseases whose sources lay outside Europe: the plague, yellow fever and cholera. Even then, the issue was to balance health and economic risks. To put it simply: what would cost people more – an outbreak that could be also an economic burden, or some drastic prophylactic measures that could slow down or even halt the flow of trade? The conference set out to harmonize maritime sanitary policies organizing traffic across state borders in the Mediterranean area. Yet, by initiating intergovernmental, multilateral and technical cooperation in public health, the 1851 conference was also a founding moment of health diplomacy.

Created in 1907, the *Office International d'Hygiène Publique* in Paris, the first international health organization with a universal vocation, is the offspring of this diplomatic process. Between 1851 and 1951, the date of the first international sanitary regulation issued by the United Nations World Health Organization (WHO), nearly a dozen conferences were held in Europe, including the Venice 1897 meeting in the context of the world plague epidemic.

The Stakes:

Health and trade, free of controversy.
The pragmatic challenge of Epidemic/Health Diplomacy

As early as 1851, it was established that scientific controversies should be excluded from international health conferences. Why? Since the 1830s, controversy had opposed proponents of contagion versus infection theories. Of course, the oppositions were not frontal. But simply put, the former favored the hypothesis that disease is transmitted through individuals, while the latter found environmental factors to be the primary causes of the spread of disease. Each theory suggested specific and differing means of prevention. The issue at stake was whether to isolate suspicious individual cases or act mainly on the environment? The first assumption emphasized quarantine systems, while the second favored less constraining preventive measures (disinfection, ventilation, individual isolation etc.).

There was also agreement to exclude politics from conference discussions. Nonetheless, the conferences were inherently political, their establishment, organization, program and purpose being intimately linked to the relations between the powers. The first international health regulations were Eurocentric, their primary effect to defend Europe against imported epidemics. Politics was not the exclusive domain of consular and diplomatic delegates. Scientists, hygienists and physicians participating in international scholarly and expert communities were not impermeable to the political context and national sentiment. Some were even committed actors in international relations. In their battle against cholera and the plague, the French hygienist Adrien Proust and the bacteriologists of the Pasteur Institute also took care to promote France's influence.

Could regulations be constructed while avoiding both scientific and political disputes? Adrien Proust, a leader in the development of the French discipline of international hygiene, recommended sticking to empirical facts and experience. International interventions, he argued, had to be founded not on dogma, but on the identification and location of the sources and global routes of epidemics, in order to adopt the most appropriate prophylactic measures. In this way, the two most salient common interests were preserved: health and trade.
As the conferences progressed across time, an ideal and official framework for negotiation was formed, putting aside both scientific dogma and political issues in order to be founded on observation, experience and pragmatism.

(Techno)sciences:

The rise of bacteriology;
its limited impact on the international control of epidemics

The first successes of microbiology gave rise to great hopes: to trace the path of disease and to develop preventive and curative treatments. In 1883, the German bacteriologist Robert Koch isolated the *Vibrio cholerae* in Egypt and India. It was now possible to identify the microbe of the disease, reinforcing clinical diagnosis and opening the way to development of a cholera vaccine which it was hoped would protect threatened populations. In Hong Kong, 1894, Alexandre Yersin brought glory to the Pasteur Institute by isolating the plague bacillus and trialing the first anti-plague vaccines and serums.

The development of bacteriology however had only peripheral impact on international health regulations. Hygienists saw with enthusiasm a confirmation of the prophylactic practices they had been promoting before the Pasteurian "revolution" [Latour, 2001]. In addition, the triumphant force of bacteriology encountered technical and material limits: bacteriological procedures were not immediate and required equipment, samples and know-how. Moreover, bacteriology did not put an end to controversy. Bacteriological processes and products were the object of competition, both scientific and commercial. Finally, the flowering of these innovations was dependent on political and social context: the acceptance of health authorities and target populations had to be acquired.

The epidemic outbreak at Porto and the internationalization of plague knowledge

From the mid 19th century, the French discipline of **international hygiene** aimed to balance the protection of public health and international commerce by harmonizing national (especially maritime) health policies. Its main approach was identification of the geographic spread of imported diseases in order to execute specific measures of prevention and control, ranging from health inspection to quarantine in lazaretto. It was thus crucial to formulate the best possible knowledge of world "plague paths". In the 1890s, two scientific disciplines contributed to this: epidemiology and bacteriology.

Epidemiology was a branch of medical knowledge dedicated to the outbreak and course of epidemics. Epidemiology consisted mostly of collecting detailed facts, compiling epidemic information to construct the history and/or the "course" of the disease, i.e. both its geographical itinerary and its etiology. Diverse instruments reinforced the international pool of knowledge. The London Society of Epidemiology aimed to produce the most

Map indicating the distribution of plague outbreaks and cholera epidemic paths (second half of the 19th century). Adrien Proust, La défense de l'Europe contre la peste et la conférence de Venise. Paris: Masson, 1897. Source: gallica.bnf.fr

universal and exhaustive knowledge, gathering statements from any scientists and physicians furnishing good field information, or through scientific surveys. Scientific networks (societies, academies, personal letters) exchanged correspondence and detailed reports, for instance in the minutes of France's Bulletin de l'Académie de Médecine. Scientific journals and publications flourished throughout the 19th century. International health conferences and congresses were also increasing in number and in rhythm, creating a major hub of production and dissemination of reports by experts in international hygiene. But the certainly crucial point was the almost daily information about the epidemiological situation in the different countries. The major role here of consular and diplomatic networks must be underlined. On the front lines, collecting and gathering epidemic information, they were essential in relaying it using both traditional postal mail and dispatch through the expanding telegraphic network.

The new contributions of **bacteriology** too were taking place on the international stage, using the same mechanisms of the internationalization of knowledge. The bacteriologists were also on the epidemic battlefield conducting research. Several international commissions conducted inquiry on the plague, particularly in India. In this context the diplomatic apparatus facilitated research and response. Some scientists arrived in the field with the support of diplomatic services (or even political actors), and all needed the assistance of the on-site consular services of their country: for administrative matters but also for introductions to local authorities and the different national communities using the established consular network. In some cases, the scientists were hosted in rooms in local consulates where they could also install their laboratory.

The plague in Porto under the lens of international health regulation

The normative response against the spread of the plague too was international. The 1897 conference in Venice set out to adapt to the plague what had been applied to cholera in terms of international health regulation. Goals were to reduce quarantine measures as much as possible, instead promoting the more public hygiene measures that would cause the least inconvenience to the traffic of goods and people - disinfection and inspection for instance. This approach relied on a trust-based system capable of rapid and reliable dissemination of international epidemic information.

In 1897, at the Venice Conference, the Portuguese representatives declared that in the "urgent necessity" of defending Europe against the plague, their government would apply without delay the provisions of the convention that had just been negotiated. But two years later, when the plague actually was spreading in Porto, Portugal came in for strong global blame: the health and politic authorities were criticized to have failed the spirit of the Venice Convention. How to explain this?

General view of Porto, by Levy and Sons. Le Monde Illustré, n°2214, 2 September 1899. Source: gallica.bnf.fr

Scientific processes, commercial, social and political issues: The slow process of recognition of the plague

In Porto, in early July 1899, the first investigations were carried out by Ricardo Jorge, director of the Municipal Hygiene Service, professor of hygiene at the School of Medicine. On July 6, he was notified of fatal cases of a disease among the inhabitants of Fonte Taurina Street. During a first visit there, he suspected "by what he saw that there were cases of bubonic plague" and notified the local authorities. Jorge sent a report to the government on 28 July 1899. Three weeks had passed since the first observations of spreading disease without any official announcement.

Conducting a classical epidemiological survey, Jorge resolved also to identify the bacteriological agent of infection. The first tests carried out under poor conditions yielded few results. Only on July 31st was the sample of better quality, permitting clear recognition of the Yersin bacillus. The work was completed on August 7 and governmental authorities were informed the next day. Thirty-four cases of plague were then officially declared.

The bacteriological process was a new – and major – step in the identification of the disease seen in Porto. But innovative does not mean quick: in this case, the process delayed the publication of declaration of the plague. This delay played a major role in the international reaction against Portugal. Several countries viewed that Portugal had not complied with the Venice Convention.

• Portugal was seen to have breached the international epidemic information system based on trust and a fast flow of data. Some countries levied quarantine on all products of Portuguese provenance. Spain judged that Portugal had hidden the situation, calling this an "act of international irresponsibility".

• In response, to reassure neighboring countries, the Portuguese government applied a series of drastic measures against Porto. A terrestrial cordon sanitaire formed by the military encircled the city, creating panic among the population, the suspension of trade, and unemployment in the factories and fisheries. Shortages, hunger, and riots loomed. Yet these public hygiene measures only reinforced the international outcry against Portugal: they were judged to be archaic and useless, adding misery to the scourge. Locally, the French consul Georges Outrey alerted his hierarchy at the Quai d'Orsay (French Foreign Office) and argued in favor of an intervention to ensure that Portugal respected the Venice Convention.

• According to Albert Calmette of Pasteur Institute, the announcement of the cordon led 40,000 out of 180,000 inhabitants to flee the city of Porto, "at the risk of spreading the disease throughout Europe".

The scientific process to assure certain identification of plague indeed delayed the publication of the information. However, Ricardo Jorge had informed the authorities as soon as his first clinical observations in early July led him to suspect plague. The ensuing bacteriological evidence could have been expected by the local and national authorities, but many other factors influenced the pattern of decision. At that moment, the political context in Portugal was very tense. Local rumors suggested that Lisboa, the seat of the national government, wanted to strangle Porto, her commercial rival. Such political, economic and social issues must be considered to understand why the authorities might delay the public announcement of the plague.

Dr. Jorge, Chief of Porto Laboratory. Le Monde Illustré n°2214, 2 September 1899. Source: gallica.bnf.fr

The plague in Porto, a place to reinforce French influence

Porto was also the scene of international cooperation to fight epidemics on the ground. On September 1899, a French mission led by Albert Calmette was sent by the Ministry of the Interior and the Pasteur Institute. There, an *ad hoc* international commission was quickly set up, headed by Jorge, by decision of the President of the Council and Minister of the Interior of Portugal. Calmette and his colleague Alexandre Salimbeni joined the commission as did other foreign scientists.

Albert Calmette and Luís da Câmara Pestana in the Porto Municipal Bacteriological Laboratory, 1899. Stereoscopic photograph by Aurélio da Paz dos Reis. Source: Maximiano Lemos Museum of History of Medicine, University of Porto.

Calmette and Salimbeni were sent to test and promote the Pasteur Institute's anti-plague serum. This had been developed as early as 1896 by Yersin and, further developed at the Institute, was intended to be preventive and therapeutic. However, its curative power was judged insufficient. A publication by the German commission working on plague in India had shaken confidence in the Pasteur procedure. In addition, the competition with Waldemar Haffkine's process developed in India was strong. This former member of the Pasteur Institute, working on cholera vaccine in India with the support of the British Government, now headed the plague laboratory in Mumbai in charge of the production of millions of vaccine doses (Löwy, 1996). Thus, according to Albert Calmette, the aim of the mission in Porto was to convince the "very excusable skepticism of Portuguese doctors".

In the midst of the Porto crisis, Calmette and Salimbeni set up a series of experiments on mice and monkeys that was deemed convincing. Quickly, the serum was widely used to treat all patients admitted to the Bomfin hospital reserved for plague patients. It was also used in preventive treatment: vaccination of doctors and employees in bacteriological laboratories, disinfectors, and employees in charge of transporting patients and dead bodies.

In this way the Pasteur Institute representatives and their mission in Porto came to reinforce the French influence on the international scientific stage. Throughout their stay, the two scientists were supported by the French consul Outrey, and the mission was supervised by the Quai d'Orsay. Outrey successfully insisted that Salimbeni remain in Porto when the Pasteur Institute decided to terminate the mission. The scientist was able to ensure the continued production of serum, in particular for the French community, and to participate in the care of patients in Bomfin.

But did the work of those bacteriologists come to reinforce international hygiene as a scientific field? Two years earlier in 1897, even Adrien Proust (a great defender of bacteriology) had stated that while diagnosis of the plague was "simplified" by the discovery of the plague bacillus, this knowledge did not clarify the etiology (causation) of the disease; as such it did not help to shape an international health regulation. But, finally, in October 1899, based on analysis of the situation at Porto, Albert Calmette proposed in a publication international prophylactic measures: transport and isolation of patients in hospitals; compulsory vaccination for any person in contact who has lived in the same house; destruction by fire or, if impossible, disinfection, ventilation and evacuation of the houses where there had been cases of plague; systematic destruction of rats; organization of research committees visiting all the dwellings twice a day; creation of "laboratories with trained personnel capable of providing information to the public authorities". Calmette concluded: "And if, in spite of all the precautions taken, our efforts were defeated, there would be no cause for alarm. The anti-plague serum will enable us to cure our patients and to prevent, by preventive vaccination, the scourge from claiming new victims."

Albert Calmette (standing, L) with his colleagues visiting plague patients at the Bomfin Hospital, 1899. Photographer unknown. Source: Institut Pasteur/Archives CNDT 55685

Conclusions: Diplomacy is everywhere, but not everything

The comprehensive approach to understanding the handling of the plague in Porto reveals the local, national and global scales of health diplomacy simultaneously at work. All levels of this diplomacy played a key role in the face of political and scientific, but also economic and social issues, and this despite the declarations of principle made by the actors, particularly at international conferences. Our focus on the diplomatic apparatus, including the consular level, shows its importance in the fight against epidemics from the end of the 19th century. Both the chancellery and the consular services were crucial in the construction and the dissemination of epidemic information: they enabled communication among foreign countries but also national health services, contributing both to dissemination of international health regulation and its application on the ground. The consular and diplomatic support offered to the scientists abroad was of strategic importance.

Looking for Europe in health diplomacy

Starting with the first International Sanitary Conference in 1851, the increasingly global character and specific features of epidemic/health diplomacy are easy to identify: global governance of epidemic hazards (normative work targeting universal rules and practices but implying division of the world into different health regions; certain ground operations); diversity of stakeholders (state representatives, private interests, politics, physicians and scientists, commercial stakeholders); co-construction of the diplomatic agenda engaging political, economic, and scientific dimensions; systemic impacts of overlapping public health and epidemic measures (for instance, affecting both departure and arrival ports). But what was European in this epidemic/health diplomacy?

The scientific field of international hygiene was above all Eurocentric, dealing with "American yellow fever", "Asian cholera" and the "Eastern plague" and aiming to prevent their spread to Europe. Consequently, Europe's health regulations differed at first from those of the rest of the world. Later, the division of the world in health regions occurred based on general health indicators and not only limited to epidemic hazards. Meanwhile the European Powers (mainly Britain, France, Germany, Russia) were involved in international health cooperation and in setting international public health agreements; they had the clear consciousness of accomplishing what they named a "civilizing mission". In an age defined by the ideology of progress, this mission fed both a European identity and imperial conquest. Moreover, for France, the fight against epidemic diseases offered another golden opportunity to carry out her own "universal mission". During the French Third Republic (1871-1940), the Pasteur Institute was a welcome tool for the Quai d'Orsay to reinforce French influence on the international stage. Beyond that, intertwining technical and international relations should allow a better understanding of the deep structures – including technical and scientific ones – of the "European order".

European identity was nourished by epidemics' provision of representations of the "Other" – and vice-versa (Frank 2004). The working-class districts of Porto with their crowded alleys were assimilated to the "East", as the home of epidemics. Their atmosphere, the rumors, the denial of the plague, the attacks on medical staff, all defied the imagination according to the French consul: "You wouldn't think you were in Europe", Outrey wrote. Here, the imagined Europe followed the arrow of hygiene and progress, embodied by the new hope born of bacteriology. It was a Europe that could control the plague in the same way as Albert Calmette did, showing off to journalists upon his return to Paris the plague bacillus that he kept in a tin box on the edge of his mantlepiece.

Fifty years later, French minister of health Paul Ribeyre proposed the creation of a European Public Health Community, based on the model of the European Coal and Steel Community. This "White Pool" would have been supranational, supporting an integrative vision of the European Communities, for a federal Europe. The Porto crisis in 1899, halfway between the first International Sanitary Conference of 1851 and the White Pool project in 1952, reveals the great diversity of paths taken by the diplomatic administration and foreign policy in the face of health and epidemic issues, contributing to shaping different kinds of European health diplomacy: from *de facto* European to European by design.

Study Questions

• To what extent does the creation of European health institutions strengthen the protection of populations against diseases?

• What "arrangements" are needed between diplomats and scientists to address a transborder health crisis? How might these differ at local, national and global level?

• Can health issues contribute to the emergence and renewal of a European consciousness?

• Does today's COVID crisis feed a political and institutional process of creating a strong and identifiable "Europe of Health"?

• How could a European-level diplomacy cope with the different temporalities of epidemic control: risk and disaster management; time for innovation; time for information; time for rumors...

Endnotes

• This InsSciDE work will be more fully discussed in a forthcoming peer-reviewed article. It is complemented by: Paillette C (2022) Épidémies et sécurité sanitaire internationale, 1851-1951 : Une approche globale. Cahiers de la sécurité et de la justice 54. www.ihemi.fr/publications/cahiers-de-la-securite-et-de-la-justice/vers-une-securite-sanitaire-premieres-lecons-dune-crise

• Cover image: Sealed original flacons of anti-plague serum, with thanks to Alexander Yersin Museum, Pasteur Institute Nha Trang, Vietnam.

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Selected Publications

(2021) L'action sanitaire extérieure de la France, 1949-1954. La nostalgie de l'influence, le pragmatisme multilatéral et les Europe(s) de la santé. Bulletin de l'Institut Pierre Renouvin 52(1):37-45. doi.org/10.3917/bipr1.052.0037

(2020) Epidemics, public health and drugs. The League of Nations and the intersecting humanitarian issues. In Hidalgo-Weber O, Lescaze B (eds) 100 years of multilateralism in Geneva, from the LoN to the UN. Volume 1. Editions Suzanne Hurter, Geneva Cham, pp 47-59

Security

Questioning Security: Science Diplomacy as Backstage Practice

Maria Rentetzi (Friedrich-Alexander Universität Erlangen-Nürnberg) and case study authors

InsSciDE's work package entitled Security: Scientific and Technical Cooperation in the Context of European Diplomacy took as a lead idea to focus on the less obvious aspects of diplomatic negotiations regarding European Union security concerns. We therefore considered the scientific and technological background to negotiations, putting less emphasis on conventional roles of front-stage diplomacy conducted by professional diplomats and turning our attention to backstage and informal diplomatic roles or even the materiality of science diplomacy such as instruments and scientific devices. We draw on the variously discussed view that much of the significant impact on international relations in matters of science and technology originates from ideas and action taken by experts and functionaries of international organizations (Kyrtsis; Adamson; Kyrtzis and Rentetzi), and frequently too those of enterprises exposed to scientific and technological risks (Kyrtsis and Rentetzi). The front-stage representatives of governments very often depend on social and political networks of such largely invisible actors. By investigating this lesser-known domain, we also question the notion of security, and argue that in science diplomacy practices security is defined by dominant actors. This is shown for example in the case of border security, to the expense of less powerful actors and, for instance, their food or water security (Mikros).

We have investigated networks of nuclear risk management which emerged before the establishment of the European Union but which had in the following years a catalytic significance for the creation of standards of both nuclear security and safety. These have been networks of people working towards the creation of the conditions of development of the nuclear industry according to acceptable standards of financial risk management. Although governments have been crucial in this effort, the main arenas of negotiations were shaped by multilateral settings. As the scenery in which these processes took place had been defined by the Cold War, negotiations on industrial matters were very often driven by the culture of coping with tensions between the dominant great powers. Our assembled case studies enable reflection on how lessons learned from these geopolitical and economic dynamics of the 1950s and 1960s may have shaped, directly or indirectly, subsequent science diplomatic approaches to handling technoscience and risk. A smaller nation might use high technology as a "diplomatic object" to address a dizzying number of national and geopolitical goals (Adamson). In the case of multinational planning and governance of the large controlled thermonuclear fusion experiment ITER, the highly diplomatic notions of reciprocity and compromise have their impact on the very construction of a first-of-kind reactor, challenging the idea that science and research might remain untouched by such decision making (Åberg).

One of the main conclusions of our case studies is that multilateralism in the domain of international security and safety issues works best through the exploitation of informal or backstage networks of exchange of ideas and information. The members of such networks very often acquire unexpectedly functional roles which sometimes become indispensable for achieving compromises and agreements. European Union networks of science and technology diplomacy have a similar structure and dynamics, and this can be made obvious when we study the internal workings of the webs of committees and working groups attached to the European Commission and the Council of the European Union, as well as the various lobbies with significant impact on the outcome of negotiations.

The architecture of large-scale information or technological systems created for border control, nuclear regulation, or even energy production, along with decisions for funding security related actions, is not a matter of technocracy but of technopolitical negotiations. Technologies and the scientific research behind these define policies, and policies define the selection and configuration of streams of scientific research, technological innovations, and funding. The compromises are reached through the active involvement of committees of diplomats or of experts with diplomatic roles representing the EU Member States. The main node in all these processes is the fact that the webs of expertise and negotiated knowledge are directly connected with the perception of and reaction to a whole range of security threats as these are defined by the most powerful actors. Thus, science diplomacy is not a naïve tool that enhances international collaborations, but a hard powerful instrument in multilateral political negotiations.

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Ambassadors as Technological Facilitators:

How Coreper Diplomats Make Possible the Legal Shaping of Border Security Technologies

An InsSciDE Case Study

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How do professional diplomats shape Schengen Area border security technologies? The development and operation of these large-scale technological systems are increasingly based on specialized European Union (EU) law – of which draft text can never be tabled for approval by the EU Justice and Home Affairs ministers without the agreement of a particular set of diplomats. These are the EU Member States ambassadors appointed to Coreper, the Permanent Representatives Committee of the Treaty on the European Union. The ambassadors seek consensus on technological issues and negotiate within their group the terms under which they can vest procedural trust in supranational networks of experts, technocrats and administrators accomplishing the preparatory work. What they mainly care about in this case is that technological views are cleared of differences between Member States. The underlying political epistemology of this special kind of security and technology diplomacy and its legal consequences are catalytic factors for the framing of the technological side of EU border policies.

Image credit: European Union

Keywords:

Schengen Area, Coreper II, border security technologies, legal shaping of technology, procedural trust

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Ambassadors as Technological Facilitators:

How Coreper Diplomats Make Possible the Legal Shaping of Border Security Technologies

For most aspects of European Union (EU) policies regarding its external borders, the impact of control and surveillance technologies on efficient operations is a key factor, often influencing disputes between Member States and thus also political decision making. These technologies, in tandem with bureaucratic procedures, are an essential durable result of the diplomacy between Member States. EU law is in this respect crucial and almost no activities can be launched without it.

The fact that border control technologies are an outcome of diplomacy is visible both from the press and the official publications of the EU. For instance, in the year 2007 the following statement appeared in various official EU documents: "Council Decision 2007/533/JHA is the legislative basis for governing the second generation of the Schengen Information System (SIS II) for the purposes of police and judicial cooperation in criminal matters". Twelve years later, in 2019, an online publication announced that "Works on Interoperability of EU Information Systems Can Start – Legal Framework Established". The legal texts adopted by the Council of Justice and Home Affairs ministers included specifications on information system architecture, on shared IT (information technology) services and applications, as well as on procedures and human resources. For example, the text of the seminal Council Decision 2007/533/JHA is an assemblage of technological and organizational requirements and thus reads in many passages as if it were an IT design document. Headings such as "Technical architecture and ways of operating the SIS II" are typical of this legal text. The specifications provided include definitions of the technical terms; operational and security engineering competencies for the responsible organizational units; categorisation of data and their flagging; description of modalities of data-entries and data-management; alerts triggering action of border guards; rules of authorisation of access to the functionalities of the system; and finally issues of governance of large-scale information infrastructure and financial planning.

Source: @EU_Commission

The same impression arises from the 2019 legislation introducing interoperability between various components of the EU border technologies. Its purpose was the establishment of interconnections between the second generation of the Schengen Information System and various other databases for border control. The system functionalities for this had been labelled with names pointing to the new architecture of the information infrastructure for border security and law enforcement. Furthermore, issues of authorisation of access of the various stakeholders of border and law enforcement operations, such as the specialized EU agency FRONTEX (European Border and Coast Guard Agency), to various databases were central at this stage of the development of the border security information infrastructure. The tech jargon again seen in this text is characteristic of many pieces of legislation framing the technological side of border policies.

Ambassadors as technological lawmakers

The adoption of this kind of EU legislation after the Treaties of Amsterdam and increasingly after the Treaty of Lisbon (effective respectively since 2000 and 2009) required co-decision by the EU Council of Ministers of Justice and Home Affairs with the European Parliament based on the law drafts prepared by the European Commission. But the ultimate agreement to table these for final approval belonged to Coreper. The Coreper (Comité des représentants permanents) consists of ambassadors representing the national governments of the Member States in Brussels with a key role in EU decision making. These diplomats regularly convene in two different formations. Both Coreper II and Coreper I play a key role in preparing the agenda and the framework of deliberations in the councils of European ministers or of the heads of national governments.

Without question, awareness of technical details is for the most

part very limited among council-level politicians who usually lack both corresponding training and time to make a close study of the proposals. In many cases, issues regarding border technologies are listed on the agenda of their meetings as 'A-Items'. This signifies that the drafts are tabled because they are regarded as fully prepared and depleted of technical, policy or diplomatic risks. Thus they can be automatically and unanimously approved without the slightest discussion. In this way the Coreper II ambassadors who give the final approval for tabling the drafts at the Council shoulder much of the responsibility for security and technology policy-making and its impact.

The extent to which these ambassadors are decisive gatekeepers in these legislative processes can be fully realized if we have a look at the timed agendas of the regular Coreper II meetings and compare the frequency there of items dealing with border security technologies with the corresponding frequency on the agendas placed before the council of Justice and Home Affairs ministers who officially pass the pieces of EU legislation on border policies. Between the years 2000 and 2019, 304 such items were reviewed by Coreper II whereas only 32 items were to be discussed by the ministers. Similarly, the European Parliament (EP) appears less involved compared to the Committee of the permanent representatives of the Member States. In the same period just 10 EP resolutions were taken with regard to the reports of the parliamentary Committee on Civil Liberties, Justice and Home Affairs (LIBE) responsible among other things for border issues.

Moreover, the wordings of decisions of the Council of the EU Justice and Home Affairs ministers are characteristic for their responsibilities in matters of border security and especially their technological side. At one instance in the 3508th meeting of the Council of the European Union (Justice and Home Affairs, held in Brussels on 8 and 9 December 2016) the drafts were returned without further deliberations to the Coreper II ambassadors. The wording concerning the EES (the automated IT system for registering travellers from third-countries, both short-stay visa holders and visa exempt travellers) is telling: "The Council confirmed the conclusion of the Mixed Committee and asked the Permanent Representatives Committee to continue to work with a view to agreeing on a mandate for negotiations with the European Parliament on the whole text as soon as possible." Even more impressive is the note of the Coreper II on 4 October 2010: "Coreper is invited to agree on these draft Council conclusions on SIS II and forward them to the Council (JHA) on 7-8 October 2010 for adoption."

A meeting room awaits Coreper in Brussels. Source: Council of the European Union Newsroom

Coreper: Agenda-setters, gatekeepers, and invisible

No legal or *ad hoc* policy decision by ministers and heads of government can be made without prior agreement between the ambassadors who function as permanent representatives of the Member States in Brussels. They meet regularly in a committee called Coreper (*Comité des représentants permanents*). The national representations are appointed by their respective governments and are staffed with diplomats, administrative personnel and most importantly technical advisors who also establish and maintain the connections with various specialized working groups, the EU bureaucracy and the policy makers of the European Commission. The top people in the representations are the ambassador (who functions as the head of the representation) and his or her deputy. They meet in two different configurations. Coreper II groups the heads of the permanent representations, who deal with political, financial, foreign affairs and security issues, including border issues. Coreper I consists of the deputy heads of these national representations; they deal with social issues and specific economic policies.

It is interesting that these protagonists of the EU law-making process, the permanent representatives of EU Member States in Brussels, remain for most observers invisible. It is thus not astonishing that their role in the legal shaping of border security technologies remains largely unknown. Of course Coreper II ambassadors are only one node in the complex webs of the EU machinery. The EU Justice and Home Affairs ministers are part of the game, as are – importantly— the specialist staff of the European Commission, or of dedicated agencies like eu-LISA (European Union Agency for the Operational Management of Large-Scale IT Systems in the Area of Freedom, Security and Justice), the Committee on Civil Liberties, Justice and Home Affairs (LIBE) of the European Parliament, and last but not least the various ad-hoc or permanent working groups that are active. But what distinguishes the Coreper II diplomats is the fact that they make the final decision on whether the issues of border technologies will appear in the agenda of the ministers. No other group has such an agenda-setting and gate-keeping role in the governance system of the EU.

Durability versus politics

What is being adopted is the durable, infrastructural side of policies. The sociologist Bruno Latour once wrote that technology is society made durable. This saying could also apply to policies. Technological systems which are crucial for the implementation of policies, such as border policies, introduce a durable element which is different from politics. Politics is something unstable, often fuzzy, variable, and mostly close to crisis management. By contrast law-based policies emerge from the intention to create systematically reproducible conditions of organizational operations. For this, lawmakers introduce bureaucratic and technological procedures. The work of ambassadors is supposed to be embedded in politics and aim towards international contracting. But multilateralism and quasi-federalism as in the case of the EU have changed this. Common rules require common procedures, and the latter also require common information bases, which makes necessary a common information infrastructure. This was the case with the border security technologies for the protection of the Schengen Area. In this field diplomats have been working against the politicians who have often violated the rules in order to cope with situations which they perceive as crises. This was the case with the 2015-2016 refugee crisis during which the operational standards of the Schengen Area border information technologies were in practice cancelled for a certain period of time. But the technological backbones and the operational standards had been enshrined in EU law, the making of which EU ambassadors accomplished through a great number of meetings.

Reflective practitioners without expertise

Coreper II ambassadors are for the most part successful in their task to create procedural and technological durability by law. They do this by being reflective practitioners who understand the art of exploiting and reconfiguring others' expert opinions. The development of border security technologies is a rather complex subject matter. The attempt to frame technological activities in this domain by means of the performative character of EU law is without any doubt a tricky exercise. The implications of these series of legislative acts are diverse. They can have an impact on public procurement and contracting with the companies which do most of the hands-on technical work, but also on administrative services belonging to the system of EU bureaucracy / technocracy. But there are also legal and fundamental rights implications which very often can be traced back to the operational modalities of the information systems for border security. It is very interesting how the ambassadors can sense when there is a sufficient

Source: Shutterstock

level of agreement among the technical experts as reported by their advisers. The latter are receivers of messages coming from a very diverse web of policy and expert networks between both individuals and working groups with institutional standing. Especially the working groups, most of which are directly connected to the administrative apparatus of the Commission, play a decisive role in the multifaceted and multilevel intra-European diplomacy. The special agencies such as eu-LISA (European Union Agency for the Operational Management of Large-Scale IT Systems in the Area of Freedom, Security and Justice), and often also FRONTEX, can be of very high importance, not only in operational matters but also in delivering reliable expert opinions. Coreper ambassadors develop the skill of seeing where the differences are in cases where these are not cleared. They mainly have to reflect on the interplay between two types of controversies: political and technical. In the context of the EU, technical controversies can easily become political and vice versa. They preferably decide on contributing to consensus finding only when it is deemed realistic to neutralize both sources of differences. The main emphasis lies of course in overcoming differences between Member States.

Technological facilitators

Researchers and practitioners in the field of technological system development (especially in the field of large-scale system development as in the case of transnationally operational border information infrastructures), as well as administrative stakeholders and representatives of business interests, play a very important role in the development and operation of border technologies. In the case of large systems, technological success depends on coping with politics and conflicts between various interests. In spite of phenomena of diffusion of responsibility, due to distributed intelligence in the context of intra-EU diplomacy, the involvement of the Coreper diplomats in EU legislative processes has a facilitating effect on the EU machinery; this applies also to the case of the development and operation of the large-scale information systems for the protection of

EU borders. By clearing national differences and by creating trust in expertise, even if this happens at a sub-optimal level and with often problematic consequences (technological, legal, and with regard to fundamental rights), the ambassadors keep the projects of planning and implementation of border security technologies afloat.

Source: Shutterstock

Stakes

Very soon after the creation of the Schengen Area it was realized that without controlling the external borders by profiling potential entrants and monitoring their stay, free movement and the application of the rule of law would be made extremely difficult. For this, a large-scale information infrastructure with a centralized core and national subsystems was indispensable. Erecting it proved to be not a simple technological task. But the stakes were not solely technological. Successfully operating these systems required harmonisation of border policies across the Union, a target that remains to be reached. And the application of technology for border surveillance and control has often implications regarding fundamental rights and a whole range of legal risks to which the EU is exposed. EU legislators must consider both operational risks and compliance of the technological planning, design and implementation processes with human rights and the rule of law. Coreper II ambassadors play in this context a catalytic role.

Technology and science

Border security technologies consist of a complex configuration of interoperable data bases with end-user interfaces which make the systems friendly to border guards and other officials entitled to access the available data. Data is being collected with conventional entries but also with the application of digital recognition technologies for fingerprints or other biometric characteristics such as DNA samples. Here hard science and high tech play a crucial role. The development of all these technological components and the definition of the modalities of technologically based border operations require a legal basis, thereby creating an interplay between expertise on technological system development and legal expertise. Furthermore, this interplay is embedded in the dynamics of EU policy making which is rarely deprived of political tensions. It requires a thorough understanding of political processes. This means that border security technologies for the protection of the borders of the Schengen Area require a high degree of knowledge-intensity but also a high degree of interdisciplinarity.

Conclusions

In most cases that could be cited, commercial or science and technology attachés facilitate technological and scientific cooperation between state organizations and private companies belonging to different national entities. But in the case of the permanent representatives of EU Member States, the situation is different. They are not facilitators by creating the conditions of cooperation, for those are already institutionalized in a multilateral setting with quasi-federalist features. Ambassadors of the EU Member States are rather part of the collective process of planning, designing, developing and operating a large-scale border security information infrastructure. The same applies to the EU ministers of Justice and Home Affairs who make the final formal decision on the legal basis of this stream of technological system development. The latter rely on the ambassadors to decide whether to table draft laws for this purpose. In spite of not having the detailed disciplinary knowledge to finely assess the technical legislation, the diplomats are gatekeepers who decide whether the results of the work of the preparatory groups and committees, as well as of the European Commission, will be forwarded to the council of ministers. They make this move conditional upon their collective understanding of whether the draft laws needed for technological system development are acceptably cleared of political and technological risks. The dependence on EU law generated through diplomacy creates in this case both a unique manner of large-scale information system development and a special kind of technology diplomacy.

Study Questions

• What do we mean by "border security technologies"? Why are they needed in the Schengen Area?

• What distinguishes Coreper II technology diplomacy from other kinds of tech diplomacy? And conversely, what makes Coreper II's action resemble any other tech diplomacy?

• What kind of knowledge is engaged by the Coreper II ambassadors in order to decide whether they will table draft law for Justice and Home Affairs ministers? Is this knowledge peculiar to tech diplomacy, or found (also) in other processes?

• Do you consider that the border security technology diplomacy described here is transparent and responsible? If not, what changes would be needed, at what level, and under which conditions could they be achieved?

Endnote

A fuller version of this InsSciDE work will be forthcoming in a peer-reviewed journal.
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(with Rentetzi M) (2021) From lobbyists to backstage diplomats. How insurers in the field of third party liability shaped nuclear diplomacy. History and Technology 37(1):25-43. doi.org/10.1080/07341512.2021.1893999

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When Lobbyists Became Backstage Diplomats:

Third Party Liability Insurers and the Shaping of Nuclear Diplomacy

An InsSciDE Case Study

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Third party liability insurance in the event of nuclear accident emerged as a hot issue in the 1950s for both the nuclear industry and experimental scientific reactors for science. What were the responsibilities of the state, its role in regulating the development and use of nuclear materials? How would the burden of indemnifying victims of severe accidents be shared between the state and private insurance? These challenging issues required multi-actor international cooperation as well as pooled insurance resources. A tight network of lawyers, insurers, scientists, engineers, industrialists, functionaries, diplomats, and politicians of various countries and with diverging views and expertise formed to negotiate legal and regulatory aspects of third party liability in the event of severe accidents. Insurers transformed their identities from lobbyists to backstage diplomats, making their role explicitly political and profoundly diplomatic in an emerging international nuclear order. Within this novel multilayered context of negotiations, the actuaries and insurance lawyers of nuclear insurance pools changed both the concept of "nuclear" and the concept of "diplomacy".

Image credit: Shutterstock

Keywords:

IAEA, third party liability, nuclear insurance pools, nuclear diplomacy

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When Lobbyists Became Backstage Diplomats:

Third Party Liability Insurers and the Shaping of Nuclear Diplomacy

Insurers and reinsurers have long lobbied governments for favorable legislation and regulatory regimes. But in the late 1950s they began coordinated efforts towards influencing international legislation addressing nuclear risks. They stepped into multilateral settings where negotiations took place to define terms of managing nuclear liability through insurance schemes. Insurers began by attending US Congressional hearings on Atomic Power Development and Private Enterprise in the mid-1950s. Very soon they were involved in the development of transnational nuclear insurance pools and increasingly participated in meetings of international organizations. The interplay between scientific and legal ideas created a special rhetoric, framing the political creation of institutional, legal, and regulatory frameworks to enable the insurability of nuclear risks. In this setting, insurers played the role of backstage diplomats.

Protagonists

We know the names of many individual protagonists such as Sterling Cole, the first president of the IAEA. He was directly involved in laying the legal basis of the insurability regime for nuclear installations. But among the most characteristic and central backstage figures were insurance lawyers like William Belser or Archibald G. M. Batten. Belser presided over the Committee for the Study of Atomic Risks (CERA), coordinating the collection and configuration of knowledge needed to adjust international legal frameworks to the management of nuclear risks. Batten was the most eminent expert in third party liability insurance, chairman of the London Insurance Institute and author of a memorandum that was highly influential in drafting the 1960 IAEA Vienna Convention. Many other names of insurers, lawyers, nuclear scientists, engineers, and physicians specializing in nuclear medicine appear in the archives preserved by the Swiss Reinsurance Company. But politicians too are important protagonists, the most prominent being US President Dwight D. Eisenhower who launched the Atoms for Peace Initiative, thus creating the conditions for the development of nuclear industry and triggering disputes on insurability regimes. The US Congressman Charles Melvin Price and Senator Clinton Presba Anderson legislated the eponymous 1957 act defining the role of the state in nuclear liability, thus influencing analogous legislative processes in all industrial nations. Beyond the insurance and reinsurance companies and the plethora of research institutes, the main actors belonged to international organizations such as IAEA, OEEC, and EURATOM.

Without acceptable legal terms of insurability of nuclear risks, investment in the nuclear industry could be neither easily expanded nor further enhanced by governments already exposed to accident risks since the construction of the first nuclear power plants in the mid-1950s. As transnational insurance pools were formed, their managers showed a vivid interest in matters of both national and international nuclear legislation. Their main objective was to see national legislation define terms of insurability as enshrined in international, multilaterally agreed conventions. To influence this transnational definition, and thereby reduce legal uncertainty, insurers became inconspicuous diplomatic mediators among governments, and opinion makers in the context of multilateral institutions such as the International Atomic Energy Agency (IAEA) and the European Nuclear Energy Agency of the Organization for European Economic Co-operation (OEEC, later OECD).

Windscale piles. Source: Energy.gov, public domain.

Pooling insurance resources, coordinating states and companies to navigate uncharted technological, financial, and legal waters

The decade leading to the mid-1960s saw expansion of a tight international and highly interdisciplinary network of negotiators comprising insurers, lawyers, scientists, engineers, businessmen, and government officials. Experts, functionaries, diplomats, and politicians with often diverging views and expertise joined deliberations on novel solutions for emerging legal and regulatory problems of radiation protection and third party liability in the event of severe accident. The establishment in 1957 of the IAEA, the only United Nations body with specific statutory responsibilities for radiation protection and safety, was the first serious international attempt to regulate nuclear energy while also actively promoting it. But the same year, shortly after the first UK and US decisions to construct commercial atomic power plants, two major nuclear accidents occurred in Kyshtym, Russia and Windscale, England. Despite cover-up efforts, most politicians, insurers and also attentive readers of the press became well aware of the threats posed by such occurrences. Those involved in the development of the nuclear industry entered uncharted technological, financial, and legal waters. They consequently had to counterbalance uncertainties not only with improved technologies and financial risk management, but also with new legal and regulatory frameworks, which introduced in turn new jurisprudence and reasoning.

Thus the insurance coverage of nuclear operators' third party liability became a critical facet of multilateral negotiations, triggered by the growing interest in the commercial exploitation of atomic energy for peaceful uses and the emergence of radiation as a new societal risk.

Stakes

In the 1950s the question was raised as to whether nuclear installations of all kinds could be regarded as insurable. The public perception of material and health impacts risked in the event of accident meant that investment in commercial or research reactors was unfeasible without acceptable levels of insurability. To create favorable business conditions, insurers crucially had to not only coordinate their own action but also to achieve coordination between the industrial nations.

The developing European nuclear industry depended on North American advances, as was apparent in the early cooperation between the US, Canada, the UK, and soon France and the Federal Republic of Germany. This cooperation required common safety standards and thus harmonization of national legislations based on international nuclear legislation, without which assessing and managing risks was not possible. No industry up to this time had ever required proactive legislation to address problems of public risk perception as an indispensable condition for its development. Lawyers representing powerful insurance and reinsurance organizations were highly instrumental mediators between the actors from different jurisdictions negotiating this special kind of law making at the IAEA and other intergovernmental or international organizations.

As of 1956 nuclear insurance pools were established. These grouped significant numbers of insurers and reinsurers in a given national market in order to distribute nuclear liability, participating according to their financial potential and readiness for exposure to these new risk configurations. Pools were soon interconnected beyond national borders through mutual insurance or international reinsurance policies, creating the need for a unified space of compatible legal standards. Insurers were right to feel uneasy in this process. Meetings and conferences, urgently focused on how to influence nuclear legislation, multiplied at a fast pace. The August 1959 proceedings of the Working Group on Atomic Risks of the European Insurers Association record that members were anxious to adapt their business plans as quickly as possible, and displayed lively interest in the passage of both national and international nuclear legislation.

Memorial to the Kyshtym accident. Image credit: Ecodefense/ Heinrich Boell Stiftung Russia/ Slapovskaya/ Nikulina

Adjusting legislation: Experts in action

Nuclear law erects norms to address the special nature of risks created by the adoption of nuclear technologies. It regulates the conduct of entities engaged in handling fissionable materials or in activities involving ionizing radiation or exposure to radiation. Legislation for mitigating radiation risks reveals a connection between operational, financial, and liability considerations.

With the promotion of peaceful uses of nuclear technologies, atomic electricity production was expected to become a rapidly developing high investment industry. The anticipated benefits could not, however, sweeten the fears of the public. For years, most people could not dissociate the probability of nuclear power plant accidents from the devastating effects of nuclear bombs. The liability issues were unprecedented. How could victims be adequately compensated in the event of a major accident with far flung nuclear fallout? No single insurer could take on the burden of indemnifying large populations, nor could operators or potential victims be deprived of insurance coverage. The nuclear industry would under these circumstances be declared economically and politically unfeasible. No government could openly accept avoidance of liability in case of nuclear accidents. The state was expected to assume responsibility and share with private industry the burden of compensating the damages to health, life, and material. To resolve such issues, proactive legal measures were deemed indispensable.

Developing such law, the first of its kind, required synergies between various fields of expertise. The harmonization of legislation was a crucial issue mobilizing actuaries and insurance lawyers to stage interpretations of nuclear liability regimes. Industrialists, politicians, and officials did not sufficiently understand the legal and financial intricacies until insurance pools began lobbying first the US federal administration and later the governments of the European industrial nations. The stakes were high: issuing insurance policies without reasonable conditions of insurability was a recipe for financial ruin.
It was not an easy task to shape the views of politicians as to the legal ramifications of nuclear insurance operations to influence domestic policies and international negotiations. In order to adjust their action and make their arguments, insurers needed to engage not only financial and legal knowledge but also scientific and technological expertise. Estimating the probability of accidents and the extent of damage, not to mention developing prevention and mitigation of probable operational failures, are matters of science and engineering. Legal arguments, from which nuclear legislation could be produced, had to reflect pragmatic issues embedded in the conceptual frameworks of nuclear physics, nuclear engineering, and nuclear medicine, as well as financial insights and the jargon of the insurers.

Transposed rhetoric of science

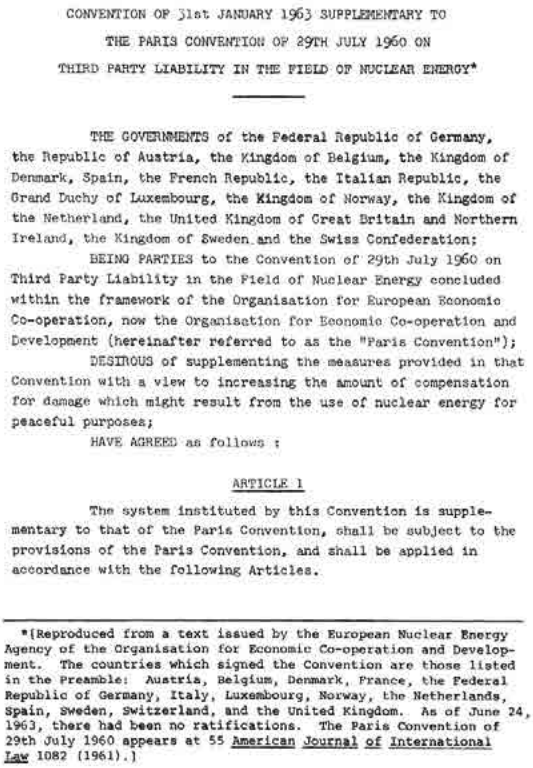
Scientists and engineers had to understand how their expertise could fuel legal arguments which were needed in diplomatic negotiations. Moreover, insurance lawyers had to invent suitable rhetoric in order to disseminate specific versions of scientific ideas in networks of decision makers. If they wanted to successfully weigh in during multilateral processes as lobbyists and opinion makers, insurers had first to influence the understanding of nuclear science and engineering among politicians, career diplomats, and high echelon administrators. The need to persuade lawmakers by combining legal, financial, and scientific arguments drove them into new rhetorical territories.

The nuclear insurance pools did not only seek to set up financial standards. They were also interested in having radiation protection standards put in place, thus linking the insurability of nuclear risks to technical and behavioral safety standards. Indeed, because no legal risk they were expecting to handle could be detached from material risk, they were also creating bridges between legal, actuarial, physics, medical, and engineering perspectives. In this respect, insurance actors developed science and engineering expertise as the basis of their risk assessment. For this purpose they obsessively collected sorely needed information, for example circulating well-elaborated questionnaires among authorities in the field of radiation injuries.

A nuclear power plant control room. Source: Deposit photos

Bits and pieces of knowledge from various fields had to be configured and reconfigured by special committees collecting and assessing information established by the insurers in order to match the cognitive requirements of the preparation of legislative and insurance decisions. Insurers visited laboratories, hospitals, and law schools. Letters and papers bear witness to considerable exchange between natural scientists or physicians and legal experts from both American and European faculties. Scientists, medical experts, and many professors of law frequented insurance and reinsurance companies in search of interlocutors with whom they could explore new dimensions of nuclear risk. Most importantly it was politicians, government officials, and especially professional diplomats who sought advice from insurers and their lawyers, who were effectively mediating between legal and scientific professions, business and politics. These actors very soon belonged to common social networks where in spite of controversies, they could make their voices heard. Despite their pivotal role in shaping mindscapes, the insurance lawyers were extremely rarely allowed to appear on the front stage. If they could stay in the negotiation room (as was the case with the 1960 Paris and the 1963 Vienna Conventions on Third Party Nuclear Liability), they were given at best the role of observers. From this position, as backstage nuclear diplomats with the aim to shape international liability regimes, they nonetheless greatly influenced strategies and tactics of negotiation by supplying risk rhetoric.

As the very meaning of insurance operations in this field was deeply altered, the professional identity of nuclear insurers, especially those working for the transnational pools, was equally being transformed. Instead of lobbying national governments, insurers helped shape intergovernmental and international legal standards for third party nuclear liability insurance. Multilateral negotiations at the Organisation for European Economic Co-operation, the International Atomic Energy Association, and the European Atomic Energy Community (EURATOM) catalyzed the harmonization of legislation through regulatory regimes ratified as international conventions. Within this multilayered context, the nuclear insurance pools in the late 1950s and early 1960s developed a unique form of nuclear diplomacy affecting both terms of 'nuclear science' and 'diplomacy.'



CONVENTION OF 31st JANUARY 1963 SUPPLEMENTARY TO
THE PARIS CONVENTION OF 29TH JULY 1960 ON
THIRD PARTY LIABILITY IN THE FIELD OF NUCLEAR ENERGY*

THE GOVERNMENTS of the Federal Republic of Germany, the Republic of Austria, the Kingdom of Belgium, the Kingdom of Denmark, Spain, the French Republic, the Italian Republic, the Grand Duchy of Luxembourg, the Kingdom of Norway, the Kingdom of the Netherland, the United Kingdom of Great Britain and Northern Ireland, the Kingdom of Sweden and the Swiss Confederation;

BEING PARTIES to the Convention of 29th July 1960 on Third Party Liability in the Field of Nuclear Energy concluded within the framework of the Organisation for European Economic Co-operation, now the Organisation for Economic Co-operation and Development (hereinafter referred to as the "Paris Convention");

DESIROUS of supplementing the measures provided in that Convention with a view to increasing the amount of compensation for damage which might result from the use of nuclear energy for peaceful purposes;

HAVE AGREED as follows :

ARTICLE 1

The system instituted by this Convention is supplementary to that of the Paris Convention, shall be subject to the provisions of the Paris Convention, and shall be applied in accordance with the following Articles.

*[Reproduced from a text issued by the European Nuclear Energy Agency of the Organisation for Economic Co-operation and Development. The countries which signed the Convention are those listed in the Preamble: Austria, Belgium, Denmark, France, the Federal Republic of Germany, Italy, Luxembourg, Norway, the Netherlands, Spain, Sweden, Switzerland, and the United Kingdom. As of June 24, 1963, there had been no ratifications. The Paris Convention of 29th July 1960 appears at 55 American Journal of International Law 1082 (1961).]

First page of the 1963 Vienna Convention. Image credit: International Legal Materials 2:4, provided by M. Rentetzi via JSTOR www.jstor.org/stable/20689656

Technology and science:

A sophisticated interdisciplinary knowledge management

Nuclear reactors, initially constructed for experimental purposes and the production of nuclear materials and isotopes and later to generate electricity, were the technologies of central concern. By the late 1950s the perception of risks and the sense of the need for their management created synergies between various fields of inquiry. One of the growing disciplines was nuclear medicine, without which safety standards could not be defined and developed. The safety of nuclear reactors and power plants required cooperation between various branches of scientific, engineering and management expertise. What really widened the interdisciplinary perspective, however, was the need to cope not only with health and material risks, but also with financial, legal, and political risks. This created a novel interplay between material technologies and intangible technologies, most prominently financial and legal. These were indispensable if financial and legal procedures, and regulatory frameworks, were to enable sound risk management. Because their purpose was to handle nuclear risks, these intangible technologies had to be informed by nuclear physics, nuclear engineering, and nuclear medicine, disciplines which came to influence as well the political epistemologies of those who played diplomatic roles in multilateral nuclear lawmaking.

From this point in time, nuclear science became increasingly a science of nuclear risk management. Risks were not understood solely from the perspective of nuclear physics, engineering, and medical research, but also as legal, financial, and political risks. Especially in the case of nuclear energy, technological, scientific, and legal issues were strongly entangled, characterizing insurance practices and enforcing radical changes in the cognitive horizon of insurers. The exploitation of science-related insurance rhetoric, aiming to influence international nuclear legislation, conceived science not as an instance of universal rationality but as a set of mental representations that could be shifted, reconfigured, and adapted to the requirements of economic and political power games. The extensive correspondence between insurers, reinsurers, functionaries and politicians found in the Swiss Re archives shows that the power of the insurance pools depended on their ability to drive political and administrative negotiators critically involved in shaping international nuclear legislation towards attitudes consistent with their views on the insurability of radiological risks. There was a consensus across the board on the need for tackling these insurability problems. Divergences were to a great extent the result of varying risk perceptions and thus of differing views on the role and content of legislation as a catalytic factor of institutional alignment of risk management practices. In this context, the insurers and reinsurers were the only ones who could transpose views on science and technology to make them fit into interdisciplinary perspectives, which could thus be made instrumental for legislative practices and insurance operations.

The diplomatic practices of the nuclear insurance pools were indeed novel. It was these practices that responded to and simultaneously shaped the equally novel economic regulatory system of international organizations that dealt with nuclear energy. Up to that time, the main diplomatic efforts in science and technology diplomacy on a multilateral level were concentrated on making artifacts and devices compatible through the adoption of common measures and standards, and thus on facilitating trade across different jurisdictions. Insurers' innovative approach to international cooperation for coping with major and high impact nuclear risks paved the way for all later styles of international negotiations on third party liability and the regulation of industrial risks.

Novel backstage diplomatic practices by nuclear insurance pool actors

- Obtaining observer seats in intergovernmental chambers
- Focusing collective energy on following and influencing international legislation
- Collecting risk quantification data
- Sparking exchange and intercourse between different types of expertise
- Integrating technical and scientific information into rhetoric serving their economic goals

Conclusions: Path breaking backstage diplomacy

We have found that diplomacy aimed at setting the international standards of third party nuclear liability insurance was very much about framing the views of policymakers of the industrial nations. The shaping of mindsets depended for the most part on the development of pertinent knowledge by insurers. For this purpose they needed international networks of scientists and engineers. Negotiated knowledge became thus the basis for rhetoric on the need for and nature of transborder nuclear liability regimes, whose creation came about in decisive diplomatic negotiations at OEEC (later OECD), IAEA, and EURATOM. The triggering factor for these developments in the 1950s was the determination of industrial nations under the leadership of the US to expansively invest in the peaceful uses of atomic energy. This provoked considerations of the risk of accidents. Governments initially believed that the private insurance industry could cope with claims in a way similar to their approach to other risks. But it was very soon realized, first by insurers and then by the governments of industrial nations, that this was impossible. While insurers pooled financial resources by creating networks of companies across nations, it was still deemed necessary that the state share the burden of indemnification in the event of major accidents with high impact on life, health, and materials. The rules by which this could happen required specialized international legislation. It was of critical importance for the insurance industry to facilitate and influence the international negotiations which had to be carried out for this purpose. This transformed them from lobbyists into backstage diplomats. The fact that the UK, France, Germany, and also Italy played a central role in these developments makes this case of outstanding interest in the history of intra-European science diplomacy and relations with the US.

A nuclear power plant control room. Source: depositphotos_2879255

Study Questions

• Insurers and reinsurers invented novel forms of science diplomacy to foster the transnational insurability of nuclear power installations and activities. Is there a present-day example of non-state actors intervening actively in science diplomacy to protect identified interests? Have these non-state actors innovated science diplomacy practices?

• Have insurers and reinsurers gained status and power in other international negotiations? What lessons should be drawn?

• Select a present-day global challenge with a large technoscientific component. In your view, which of the novel science diplomacy approaches elaborated by insurers could or should be applied to advance its resolution?

• Influencing scientific understanding and the mindsets of legislating politicians was crucial in the negotiation of international law on third party nuclear liability. What kind of knowledge was needed for this and how was this knowledge developed? Are there present-day examples of integrating a vast range of disciplinary considerations into diplomatic rhetoric?

Endnotes

• A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See Kyrtsis AA, Rentetzi M (2021) From lobbyists to backstage diplomats. How insurers in the field of third party liability shaped nuclear diplomacy. History and Technology 37(1): 25-43. doi.org/10.1080/07341512.2021.1893999

• Cover image: British postage stamp: "Advanced gas cooled reactor. Windscale", circa 1966. Image credit: Boris15, Shutterstock n° 86072641.

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Diplomatic Objects in Nuclear Science Diplomacy:

Morocco's Stranded Research Reactor

An InsSciDE Case Study

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The "Orphaned Atoms" case study explores the effort made by the Kingdom of Morocco to acquire a nuclear research reactor at the end of the 1970s. This examination is made via the notion of the nuclear reactor as a "diplomatic object" through which given diplomatic effects are achieved.

In this case, the diplomatic concerns advancing Moroccan acquisition of a research reactor were not only those of non-proliferation and access to research tools, but a dizzying number of others: development, energy, and commercial policies, Cold War geopolitics, regional alliances, and member state relations with the International Atomic Energy Agency.

The failure to complete the reactor reveals not botched diplomacy but diplomacy's success, as the enactment of certain diplomatic frameworks catalyzed a decision-making process that halted the project.

Image credit: US NARA

Keywords:

Diplomatic objects, research reactors, Morocco, nuclear non-proliferation

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Diplomatic Objects in Nuclear Science Diplomacy:
Morocco's Stranded Research Reactor

The diplomatic frameworks in which science diplomacy takes place are numerous, and it is often at their overlap that decisive results occur. However, observing that overlap is not simple.

A given batch of archival records, issuing from a single office, will focus on only one area of concern. Historical witnesses,each with a particular point of view and set of interests, will illuminate a single area of action. And even if multiple areas of evidence are accessible, a coherent narrative can be elusive.

One approach to achieving coherency and historical depth in science diplomacy narratives is to conceive of an important scientific instrument or other material entity as a 'diplomatic object.' Such conceptualization permits the observer to identify the various protagonists engaged in a science diplomacy exercise, to discern the different social, political and economic stakes involved, and therefore to perceive the overlapping diplomatic frameworks in which historical events unfold and science diplomacy is shaped.The present study does just this by considering the effort of the Kingdom of Morocco to obtain a nuclear research reactor at the end of the 1970s.

In this case, the prospective Moroccan research reactor became a diplomatic object, and the archival documentation and participants' memories surrounding it reveal the dramatically varying sorts and levels of authority which became involved in the reactor's fate.

The framework of science and development

The story begins in the early 1970s with international-level administration in science and development. Throughout the 1960s, echoing the culture of portable experts cultivated by the International Atomic Energy Agency (IAEA), a series of IAEA scientists visited Morocco to help impart expertise and instrumentation in specific areas like agriculture, medicine, and uranium prospection. Support for expert missions came not only from the IAEA but from the United Nations Education, Scientific, and Cultural Organization (UNESCO) and the United Nations Development Programme (UNDP), both of which might then refer to the IAEA for a nuclear expert.

In 1972, the UNDP-supported mission to Morocco turned to nuclear physics. While this might perhaps appear odd in the framework of development diplomacy, it had clear purpose.
At that time, Moroccan physics students with the ambition to pursue their studies to the Ph.D. level in nuclear physics had no choice but to go abroad and more often than not stayed in the countries where they carried out doctoral work. The UNDP and IAEA sought to address the resultant brain drain by building native Moroccan capacity to train students in higher-level nuclear physics and then enrich the Moroccan technological landscape with nuclear-related applications. The latter meant that the core institution involved, the University Mohammed V in Rabat, cooperated with other state institutions, such as the Ministry of Energy, the National Agronomical and Veterinary Institute, the national mining administration, and the Ministry of Public Health.

The result of the IAEA-UNDP mission was not just that the University's Department of Physics expanded its range of international contacts and collaborations to countries like Belgium, France, Hungary, the Netherlands, and Yugoslavia. The Department's own capabilities and ambitions expanded. By 1975, it was clear to the Department of Physics that only a nuclear research reactor could produce the neutron fluxes necessary for the experiments and radioisotope production it envisaged. A reactor in the 100-150 kilowatt (kw) power range appeared most suitable for the Department's needs and the University's capacities, and working with IAEA experts, the Department considered models from the US, Canada, Poland, France, and the United Kingdom.

The diplomatic dimensions of a research reactor

Up to that point, the prospective reactor was, as a diplomatic object, a subject of negotiation for the sake of the improvement of nuclear physics training in Morocco. However, nuclear reactors, even low-power research reactors, could potentially involve other diplomatic frameworks. Uranium fuel was subject to international safeguards. Research reactors could produce sensitive, controlled materials. Such reactors could serve to train operators of larger, much more powerful nuclear power stations.

Technology

Research reactors are so ubiquitous—more than two hundred worldwide, more than one hundred in the US alone—that we might miss their significance for science diplomacy.

Of these reactors, the most numerous single type is the Triga, manufactured by the US firm General Atomic. There are 66 Triga reactors in service in 24 countries around the world, and the kinds of radioisotopes they and other research reactors produce have been in mass circulation since the opening of the nuclear age at the beginning of the Cold War.

Such research reactors and the research complexes that surround them serve to connect numerous international, state-level, institutional, and local interests, and they have been of central importance to the science diplomacy networks of the nuclear age.

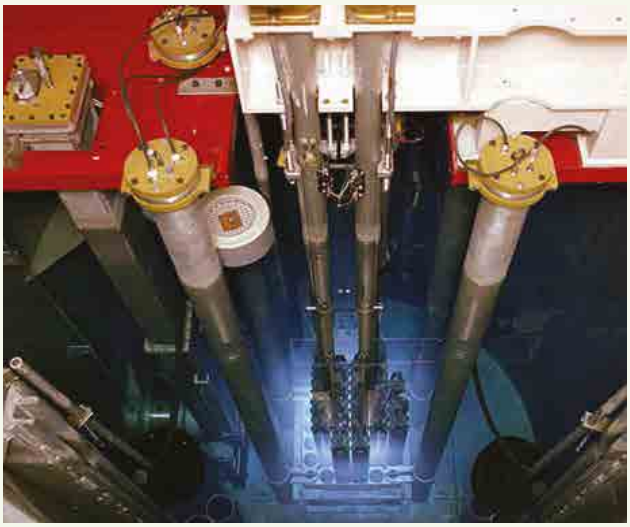

Image credit: Idaho National Laboratory, public domain.

Energy policy and foreign investment now began to appear in the background of Moroccan research reactor acquisition. The rise in world petroleum prices threatened to destabilize Morocco's import-dependent economy, and nuclear energy appeared as one option for avoiding massive price escalation. Therefore, in November 1976, upon the occasion of a state visit to France, Morocco head of state King Hassan II launched an inquiry about obtaining nuclear power plants from France. French President Valéry Giscard d'Estaing rebuffed Hassan's suggestion. The French administration believed that Morocco could not commit to such an expensive investment and suspected that Hassan's motive was to position himself as a regional rival to Iran, where the Shah had initiated an ambitious national nuclear program. Hassan, however, could turn to other vendors. Within a week of his return from Paris, the Moroccan Foreign Minister delivered a letter to the US embassy in Rabat informing the US administration of Moroccan interest in a nuclear power plant.

US assessment of the letter and of the larger diplomatic situation revealed the complexity of the situation and the delicacy required of the US response. Regionally, Morocco's occupation of much of the Western Sahara in 1975 heightened tensions between Morocco and Algeria. This made even more significant the USSR's occasional effort to establish a presence as an investor in Morocco, where French and US interests were already heavily invested.

Meanwhile, King Hassan II had fashioned himself as a pivotal figure in North Africa and the Middle East, an Arab leader who understood the West (he had studied law at the University of Bordeaux), favoured alliances with Western partners, and who could serve as an intermediary in the pivotal region.

Furthermore, in his letter inquiring about US investment in nuclear energy, Hassan had carefully referenced Morocco's strict adherence to the Nuclear Non-Proliferation Treaty (NPT). The timing was good. The importance of non-proliferation strategy to US policymakers had increased considerably during the mid-1970s in reaction to India's surprise 1974 atomic weapons test. Morocco—vigilant to uphold the sovereignty of its territory, long protesting that bordering regions were unfairly taken from it, in constant conflict with its eastern neighbor—was an important test case. So, while US embassy officials in Rabat thought that a Moroccan nuclear powerplant was many years away, they looked favourably at a proposition from a publicly visible NPT adherent. Besides, US investment in Morocco was steadily increasing.

By all appearances then, at the beginning of 1977 as the incoming Carter administration prepared to uphold and in fact increase the strictness of US non-proliferation policy, the potential sale of a US reactor had riding on it a great deal as a symbolic and practical first step in nuclear technological transfer. Given the Carter administration's refusal to recognize Moroccan annexation of the Western Sahara and its hesitation to sell tanks to the Moroccan army, the stakes were even higher: sale of a research reactor would help maintain an overall appearance of friendly relations despite the tensions.

In his letter inquiring about US investment in nuclear energy, Hassan carefully referenced Morocco's strict adherence to the Nuclear Non-Proliferation Treaty.

Furthermore, the US embassy in Rabat got wind of the fact that the US Westinghouse enterprise had started talks with the Moroccan State Phosphate Authority about the construction of a factory to extract uranium from Morocco's phosphate deposits. Such an undertaking would be immense and lucrative, and further heighten the commercial implications.

One wonders if the Department of Physics of the University Mohammad V and its IAEA advisors had a real sense of the larger stakes involved as they prepared to finalize their choice of reactor type. Their modest prospective research reactor had become an object in overlapping diplomatic frameworks that included non-proliferation, regional relations, commercial and energy policy.

Stakes

Different parties invested different hopes in Morocco's prospective research reactor. For the Department of Physics of the University Mohammed V, the reactor was above all else a machine for expanding research and teaching capacities. The UNDP as well as the Moroccan state administration viewed the reactor as a local producer of radioisotopes for use in various agencies and a magnet for keeping the most promising young scientists in Morocco rather than seeing them leave to train and work abroad.

As the research reactor became linked to larger commercial initiatives, the stakes involved in its transfer grew as well. The Moroccan minister of energy and mines inscribed the reactor in the country's five-year energy plan and US and Moroccan diplomats commenced discussion of the possibility of building nuclear power plants on Morocco's Atlantic Coast, as well as recovering uranium in Morocco's immense phosphate deposits.

However, the highest stakes were detectable with the US and Moroccan heads of state. The transfer of the research reactor created for US President Jimmy Carter an internationally visible adherence to the US-backed non-proliferation regime from an important regional ally. For King Hassan II of Morocco, a reactor deal signaled the backing of Morocco's most powerful geopolitical ally.

Finally, one should not lose sight of the stakes for the IAEA. By virtue of its role in advising for and providing a regulatory safety check on the reactor project, the Agency strengthened its status as the international arbiter of the circulation of nuclear technoscience.

Reactor diplomacy and diplomatic objects

At the end of the summer of 1977, the Department of physics made their choice: a Triga Mark 1 research reactor rated at 250 watts. Triga reactors were manufactured by the General Atomic enterprise in the United States, and once Morocco agreed to a bilateral arrangement with the US, the reactor would be installed at the University Mohammed V in Rabat. In a multi-fold process that lasted over two years, the details and legal agreements regarding the reactor's sale and the safeguarding of its uranium fuel were solved. It is in this process that the reactor's status as a diplomatic object is most readily visible. From the first discussions of a research reactor in the Department of Physics, the prospective reactor achieved the effect of drawing Moroccan, IAEA, and UNDP experts into a common negotiation concerning Moroccan scientific development and its relations with the IAEA and other IAEA member states. This reinforced the authority of the IAEA in the circulation of nuclear technoscience and positioned Morocco within an important technoscientific network centered in large part on the Agency.

The choice of a US-built Triga reactor catalyzed a series of conversations between Morocco and the United States. One of these conversations involved non-proliferation. As we have seen, Morocco publicly acceded to US preferences in non-proliferation policy. In 1978, the two parties agreed to the transfer of the reactor under the conditions assumed by Morocco's adherence to the NPT. The full Nuclear Cooperation Agreement (NCA) involving transfer of uranium fuel came, after some delay, in 1980. All of this action around the safeguarding of a modest amount of lightly enriched uranium served the US purpose of prioritizing non-proliferation in its approach to the international circulation of nuclear technology and underlined the power the United States had to maintain that priority.

But as an object, the prospective reactor represented more than the US-backed non-proliferation regime. When he learned at the end of 1977 that the University Mohammed V would purchase a US-built research reactor, Moussa Saadi, Morocco's powerful minister of energy and mines, decided to inscribe the reactor into his ministry's next five-year plan. The prospective research reactor became an object of energy policy and diplomacy. In January 1978, U.S. Secretary of Energy James Schlesinger paid a visit to Moussa Saadi in Rabat, a visit that included a stop in Safi, the site of Morocco's prospective uranium extraction plant. Saadi then enjoyed Schlesinger's hospitality three months later, spending nearly a week in the US in April. By the end of the two visits, the research reactor sale was embedded in a much wider energy exchange proposal: uranium extraction from phosphates, oil shale exploration, solar energy, all were on the table thanks to the negotiations which the reactor initiated.

In November 1978, another effect of the reactor as diplomatic object became visible, when King Hassan II paid an official state visit to US President Jimmy Carter. At the White House in Washington, D.C., the two discussed not only Middle East peace and Maghreb region stability but also the completion of the Nuclear Cooperation Agreement (NCA) as well as energy technology and resources. The visit was satisfying to both parties. Not only were his non-proliferation preferences bolstered, but Carter had the opportunity to show support for a key regional ally despite the tensions caused by Morocco's occupation of the Western Sahara. For Hassan, the audience with the US president reinforced his and his country's diplomatic importance and signaled support to come from the US superpower.

Significantly, Morocco managed the purchase of a US research reactor when its neighbor and rival, Algeria, failed. The US denied the sale of a research reactor to Algeria when the

Jimmy Carter welcomes King Hassan II during arrival ceremonies for the King of Morocco, 14 November 1978. Image credit: NARA n°182348; public domain.

The diplomatic framework of nuclear safety

General Atomic had the reactor vessel for Morocco's Triga Mark 1 reactor delivered to the port of Casablanca in 1979. Framed by non-proliferation, by commercial opportunity, by lucrative foreign investment, by energy policy, by national development, as well as by regional stability and rivalry vis-à-vis Algeria, the research reactor had great diplomatic weight, seemingly more than enough to assure its completion. However, for Moroccan state institutions like the University Mohammed V and the Ministry of Energy and Mines, uncertainty persisted. Soon, different diplomatic processes would force these institutions to come to grips with the reactor's reality as a material object—a reality involving safety standards and yet another diplomatic framework.

Nuclear safety had been a routine concern from the beginning. As early as 1976, through its expert embedded in the Department of Physics, IAEA headquarters had advised the University Mohammed V on siting the prospective reactor. By 1977 and the opening of negotiations between US and Moroccan governments, a lower level of nuclear safety diplomacy conducted through the personnel and offices of the IAEA and different institutions in Morocco suggested that problems might arise. Appropriation of land for the reactor by the Ministry of Interior faced significant delays, as did approval for the design of the air conditioning system of the reactor building. Meanwhile, an IAEA expert observed that the radioprotection service in the Ministry of Health was chronically underfunded and lacked transportation and personnel for the scale of operations to come.

Protagonists

The number of institutions and countries involved in the episode is, at first glance, startling. The IAEA, the UNDP, UNESCO, many government administrations (especially in Morocco and the US), and a number of universities and private enterprises were at times drawn into the story of the reactor.

Nevertheless, what stands out historically is the degree to which national administrations became involved in the proceedings. The fact that the topic of the research reactor's transfer made an appearance in conversations between US President Carter and Moroccan King Hassan II is itself striking. Moreover, crucial administrators such US Secretary of Energy James Schlesinger and Moroccan Minister of Energy and Mines Moussa Saadi also became directly engaged in the transfer of the research reactor and its wider meaning for Moroccan energy policy and for US-Moroccan commercial relations.

Meanwhile, the variety of Moroccan institutions involved, while initially a sign of the strength of support for the initiative to acquire the research reactor, ultimately revealed the initiative's fragility: when the siting of the reactor shifted from the University Mohammed V to the National School for Mineral Industries, it signaled how the reactor had become, in the words of one observer, "a hot potato," a scientific machine lacking the widespread administrative support necessary for its successful implantation and use — despite its prior diplomatic utility.

UNDP and IAEA administrators diagnosed the problem as having a diplomatic origin. The original UNDP-IAEA project lacked the necessary Moroccan counterparts to extend its information channels and services to the various embryonic Moroccan state institutions necessary for the material construction, maintenance, upkeep, and safety of a research reactor. The Department of Physics of the University Mohammed V was not enough. One IAEA official suggested any follow-up project include the Ministry of Energy and Mines and the Office of Mineral Exploration. However, it was a tall order to expect the Department of Physics to coordinate various Moroccan national administrations. The Department and the University Mohammed V determined that the appropriate siting for a research reactor and complementary facilities must be separate from the university—a sort of national nuclear center to be operated by the University. However, as late as the end of 1979 there still was no clear staffing plan or central safety analysis.

It was a tall order to expect the Department of Physics, stretched to the limit by the daily requirements of teaching and academic administration, to coordinate various Moroccan national administrations

In effect, the diplomatic frameworks in which the selection, purchase, and authorization of the reactor had occurred had become separated. For Rabat and Washington, agreement on non-proliferation principles, on energy strategy, and on commercial agreements suggested a research reactor straightaway. For the University Mohammad V, various Moroccan ministries, the UNDP and IAEA, the supporting personnel, offices, and legal framework were still in a nascent stage.

Nevertheless, showing the weight of the research reactor as a diplomatic object, the Moroccan government persisted down the nuclear path. A 1981 mission, supported by the IAEA and the French parastatal enterprise Sofratome, carried out a study of sites for a future nuclear power plant, ultimately determining that it should be at Sidi Boulbra, between the Atlantic coast cities of Safi and Essaouira.

Two years later, the United States, Morocco, and the IAEA added the standard trilateral Project and Supply Agreement to the previous bilateral agreement to ensure legal supervision of all transferred nuclear materials. However, little came in the way of further preparations at the University Mohammed V. In the words of an administrator at the time in the Ministry of Energy and Mines, the Triga reactor had become a "hot potato."

The University Mohammed V was not ready for it, but other Moroccan institutions and ministries could not determine a site for it either. In a bid to save the reactor, the Moroccan government moved it to the Moroccan National School for Mineral Industries (ENIM), where a UNDP-UNESCO project was underway. ENIM began consultations with a Catholic University of Louvain nuclear physics professor about the design of the reactor housing, and Moroccan authorities returned to the forum of the IAEA for information and analysis of safety and siting.

In late May 1983, a three-expert IAEA mission arrived in Rabat to assess the proposed siting of the reactor at the National School of Mining Industry. They were alarmed by what they found. Just 200 meters from the proposed reactor site was a petroleum tank farm, including a spherical reservoir holding approximately 1000 tons of butane. Using IAEA computers in Vienna, the mission determined that an explosion of this gas would result in an exertion of 2 to 2.5 bars of pressure at the proposed reactor site. This was enough to destroy the concrete walls of typical power plants and to demolish research reactor housings. Furthermore, no one had yet accounted for seismological conditions, which the experts considered risky. The advice of the IAEA mission members was firm: without removal of the petrol tank farm, another site should be chosen.

Meanwhile, impasse gripped the Moroccan government. Not all ministers were willing to authorize construction. The Moroccan domestic situation had turned for the worse, adding to the uncertainty. A catastrophic drought in 1981 had led to massive food imports, runaway inflation, International Monetary Fund debt, and riots in Casablanca.

The expense of a research reactor and facilities served as another reason to forego the installation of the Triga. Finally —and significantly—the reactor's diplomatic weight had dropped considerably. Since the fall of the Shah in Iran in 1979, US support for Morocco had grown, and US President Ronald Reagan, elected in 1980, proved more willing than his predecessor to offer arms to the Kingdom as a sign of cooperation.

When Hassan II visited the White House in May 1982, Reagan did not admonish the Moroccan king for the continued occupation of the Western Sahara, but instead praised the US-Moroccan strategic dialogue on "progress in the Middle East and...security issues." Paradoxically, the research reactor became less important as a symbol of friendly alliance—there were plenty of other symbols to suffice.

King Hassan II of Morocco and President Ronald Reagan ride at Fairfield Farm in Winchester, Virginia. 19 May 1982. Image credit: NARA n°75856801; public domain.

Conclusion: Diplomatic frameworks and diplomatic objects in science diplomacy

By 1985, the UN agencies involved had brought the project to improve the National School of the Mining Industry to an official end, and with it, the Triga reactor. The demise of the forlorn research reactor, the vessel for which was gathering dust in a National Office of Electricity warehouse in Casablanca, might have left the parties involved wondering what had gone wrong. Had inattention to safety standards done the project in?

Not exactly. If we consider the reactor as a diplomatic object and reflect on the various frameworks in which that object was conceptualized in different diplomatic processes like commercial negotiation, state-level discussion, and international regulation, then we begin to see how dislocated those frameworks became. While the U.S. and Moroccan governments both saw as finished the work of agreeing to and transmitting international security principles, in other diplomatic frameworks—international nuclear safety standards as well as the diplomacy of development—much information was still to be shared and work to be accomplished.

In fact, the conclusions reached by the 1983 IAEA safety analysis mission and the Moroccan willingness to heed them suggest how effectively the prospective reactor functioned as a diplomatic object. It stimulated science diplomacy network into action. When the Moroccan government informed the IAEA at the end of 1984 that it had abandoned the plan to site the research reactor at the National School of the Mining Industry and had decided instead to create a new agency, the National Center for Nuclear Studies, Science, and Techniques (CNESTEN), this too reflected the effectiveness of the prospective Triga reactor as a diplomatic object. Its potential construction had encouraged information to move successfully through various diplomatic channels. What followed in Morocco in the 1990s were more robust legislative and regulatory frameworks for constructing and monitoring a reactor. Morocco renegotiated its agreement with the US, ultimately choosing to build a larger, more powerful research reactor which was completed in 2007.

One Moroccan administrator describes Morocco as having started "a relationship of equals" with the IAEA after the failure to complete the original reactor project. Perhaps so. We can observe that Morocco's nuclear advocates had by then faced the "interdependency within an international community of outside agencies and governments" that, for example, Ghana's nuclear advocates had faced years before, as Abena Dove Osseo-Asare has documented. This interdependency could, indeed, turn to a "relationship of equals," witness the present status of Morocco's nuclear reactor and facility at Maâmora as a regional IAEA center, whereas other Francophone African countries send specialists to train in radiation protection, isotope hydrology, and nutrition. But one price of that interdependency is the slow, painstaking effort countries in Africa and elsewhere must make to realize the technical capacity of the Global North.

If there is a lesson for observers of science diplomacy in the episode of the first prospective Moroccan reactor, it is that science diplomacy exercises, including those of nuclear diplomacy, can and often do involve multiple diplomatic frameworks—and the conceptualizing of a scientific instrument or other material manifestation as a diplomatic object can illuminate those frameworks. And as we have seen, these objects can achieve diplomatic effect even when they do not immediately materialize as realized scientific instruments.

The Triga research reactor at the center of the Morocco-US-IAEA diplomatic triangle served as not only a beacon for technoscientific development (for the University Mohammed V and Morocco as well as the IAEA), commercial success (for General Atomic and the US), and the possibility of a nuclear future (for Morocco's Ministry of Energy and Mines).

The prospect of its transfer to Morocco helped accomplish diplomatic goals: enriching Morocco's connection to the international nuclear technoscientific community, opening a new channel of communication between Morocco and the IAEA, reinforcing the US goal of non-proliferation, and serving to mark positive U.S.-Moroccan relations. And it was diplomatic accomplishment that left the reactor orphaned. Not only were Moroccan institutions unready to take the reactor in—as the IAEA safety inspection had shown—but with the above diplomatic effects stimulated, there was not an urgent diplomatic need to accomplish its construction immediately and thus it ended up abandoned. And it is no coincidence that today the nuclear facility and reactor that are now in operation north of Rabat do both scientific and diplomatic work.

Study Questions

• How do different areas and levels of diplomatic activity interact in this particular case? Would you describe that as typical in episodes of science diplomacy? Why or why not?

• What does this case reveal of power asymmetries among diplomatic partners? What could have tipped those imbalances in another direction? In particular, how could a different use of "diplomatic objects" change the scenario?

• What role does the International Atomic Energy Agency play as an intervening agent in this particular episode? In what ways can intergovernmental organizations such as the IAEA either promote or limit scientific cooperation?

Endnote

• A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See Adamson M (2021) Orphaned atoms: The first Moroccan reactor and the frameworks of nuclear diplomacy. Centaurus 63 (2):262-276. doi.org/10.1111/1600-0498.12350

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A Fusion of Reciprocity and Compromise:

Everyday Science Diplomacy at ITER

An InsSciDE Case Study

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This case explores the intricacies of governing the large controlled thermonuclear fusion experiment ITER currently being built in Cadarache, France. ITER is one of the world's largest technoscientific collaborations, yet its complex organization and cumbersome logistics have even its proponents admitting that things probably should have been done otherwise. This historical analysis delves into the decisions taken during the negotiation phases of the project, showing the importance of reciprocity and compromise to find solutions acceptable to the parties involved in this diplomatic and scientific "assemblage". How far can science diplomacy go before it affects technoscientific choices and practices? If the careful give-and-take of reciprocity between unequal powers is a hallmark of diplomacy, to what extent are possibly inefficient compromises needed to make a project such as ITER materialize at all?

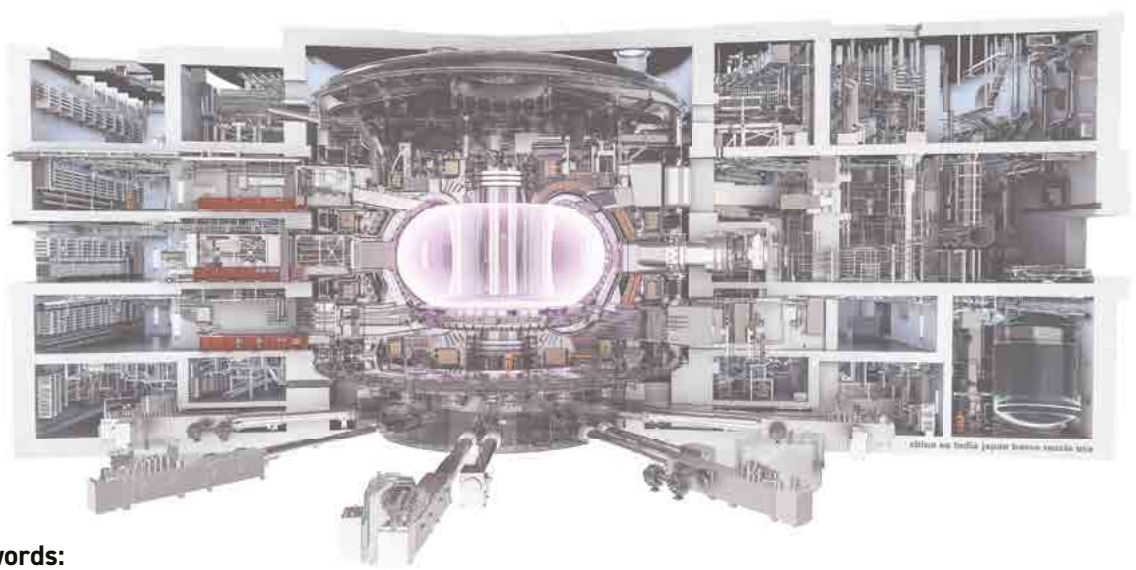

Image credit: © ITER Organization

Keywords:

Big Science, fusion, reciprocity, compromise

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A Fusion of Reciprocity and Compromise:
Everyday Science Diplomacy at ITER

ITER is ambitious in both scope and aim. The name is short for International Thermonuclear Experimental Reactor, as well as the Latin word for "the way", as in "the way to new energy". The ITER project is one of the largest technoscientific collaborations in the world today, currently including the European Union (EU) through Euratom (and the UK through an agreement with Euratom), Russia, Japan, the US, South Korea, India and China. The undertaking aims to build knowledge and know-how in the fusion field in each of the nations involved, while simultaneously constructing a functioning 'first-of-its-kind' fusion reactor.

Currently scheduled to achieve first plasma in 2025, and full operation in 2035, ITER is a combination of a research project and an industrial development project, in which states need to maintain multiyear collaboration despite periods of difficult geopolitical relations. Building a machine such as ITER is, to say the least, a complicated process, where diplomacy, management of complexity, and negotiation are at the heart of the project. This is true not only for the top-level politicians who sign agreements enabling this Big Science endeavor. It is true also for the science policy advisors, scientists, engineers, lawyers, economists, and managers working on the project, all the way down to the work site itself where German welders may work under Indian supervision following French nuclear-safety protocols. One could say that technoscientific diplomacy is performed there on a day-to-day basis.

Recent science diplomacy literature and discussion have often held up ITER as a successful large international undertaking where diplomacy aids science collaboration. Meanwhile, the project has also been heavily criticized. Delays, inefficiency but also organizational solutions in and of themselves have come under fire. In 2015 an evaluation almost led to the end of the project, before a change in leadership and a revision of the project schedule allowed it to move forward again. Even ITER personnel admit that the project conception is, in many ways, dissatisfactory from both scientific and management perspectives. Yet the working setup is the result of compromise, which in turn is a result of a quest for the balanced exchange of reciprocity. This InsSciDE case highlights three major – and sometimes surprising – organizational options chosen during the early negotiations in 1988-2000 and shows how the inherent tensions of this Big Science project were addressed through reciprocity and compromise as both ideal and practice.

Fusion as technoscience and imaginary

A short and greatly simplified definition of fusion is: a process of generating energy through the fusion of atoms. The process is similar to that responsible for the heat and glow of the sun and other stars, as opposed to the splitting of atoms, which is the process that happens in our nuclear power plants today. The possibility of creating an infinite solar reactor on earth has intrigued many scientists and has become a part of our political and cultural imagination. Thus the fusion sociotechnical imaginary, combining a narrative of modernity and high-tech endeavors with the utopian vision of eternal energy, has fed fusion interest over time. Since the Geneva meetings in 1956 and 1958, when the main fusion (and nuclear) powers including the Soviet Union, the USA and the UK formally declassified the related research, fusion has embodied the possibility for scientific cooperation in a high-profile area, without short-term risks. The possibility to collaborate in an important and highly politicized scientific field while knowing that applicable results as well as high costs would be forthcoming only in the long term made fusion a fitting subject for diplomatic relations. The risk of the research being used for military purposes was also deemed lower than in the case of fission research. However, putting the sun into a bottle (another popular description of fusion) comes with large challenges. Fusion is pure technoscience in the sense that new technologies are needed both to develop a fusion energy system and to produce knowledge on fusion. The ensembles needed to undertake such research are resource-heavy, "visible, and accountable to other researchers and to the public, and so become more tightly coupled to diverse communities" (Hacket et al.). So far, a contained steady state fusion process that would generate energy at an economically viable cost has not been achieved. ITER is the latest, and certainly the largest, attempt to change this.

Protagonists

The parties invited to become a part of the ITER project from the beginning in the 1980s already had extensive fusion programs and had collaborated in different ways in the field: the EU (through Euratom), Japan, the Soviet Union, and the USA. By this time, a tight-knit international fusion community had developed, and many scientists knew each other well.

Negotiations during the 1990s included a strong group of bureaucrats who had been scientists but now worked in the science administration of the involved countries and institutions. Some scientists were also to some extent "forced" to become diplomats, when they were tasked with working on ITER for their respective governments and ended up in positions where they had to do scientific work with colleagues, while at the same time defend the science political rationalities of their own countries.

Another important characteristic of the starting phase of ITER was the consistency of actors and networks over the different negotiation periods. This includes not only actors in the fusion community that had developed over many years, but also a political stability. As an example, during the multiyear siting discussions during the 2000s, key political leaders or tendencies, and bureaucrats, remained unchanged at the European Commission level, and at national level in Russia, the US or EU Member States. The fusion scientists at the home institutions and the International Atomic Energy Agency (IAEA) provided further institutional support and consistency. This means that despite certain criticism and uncertainty there were also actors at all levels who were positive and persistent. This was to some extent different in Korea and Japan, where there was also support, but some bureaucrats turned over more quickly. Furthermore, this was a period when despite some geopolitical conflicts the zeitgeist encouraged international collaboration, especially between the West and countries like Russia and China who were viewed as engaged in a democratization process. Scientific collaboration was thought to be an aid in that process. The project has so far survived several changes in this world order, as well as many geopolitical conflicts between the parties.

Stakes

Up until the 1980s, while transnational scientific collaboration had taken place between research groups, national programs had for the most part retained their autonomy in building the large devices required for fusion processes. When ITER was first invoked in 1985 all involved actors had their own plans for larger tokamaks, and these programs would thus be competing with ITER for resources. Many in the European scientific community, viewing ITER as a political project between the two superpowers, did not trust that it would become reality. It was decided to continue development of Europe's NET device as the "next step" towards a fusion reactor. A similar discussion took place in Japan, where after smaller experiments of the 1950s and 1960s government had promoted fusion into a prioritized national program in 1975, and researchers worked toward a "next step" machine called the Fusion Experimental Reactor (FER). In the USA, actors similarly hesitated to sign on to ITER due not only to expected rivalry with running national programs, but also reluctance to participate in technological transfer with the Soviet Union.

"Within the machine: the temperature of stars." Cover of the Soviet magazine Technology for Youth, October 1959. Image Credit: Tekhnika Molodezhi.

Despite such misgivings, global international cooperation was still seen by many as the only way to achieve a large demonstration reactor, since no one actor had the resources to build it independently. In the late 1970s high cost estimates and an inability at national level to produce components for the next generation of fusion machines had moved the Soviet Union to suggest the INTOR (INternational TOkamak Reactor) collaboration. European member states cooperation on JET (Joint European Torus, from 1978) was motivated by the fact that without Euratom support, isolated programs were not likely to secure state funding. Similarly, the Japanese government saw in ITER an opportunity to share with other parties the costs of building a demonstration reactor. In Japan, this intra rivalry was appeased in the end by reconceptualizing ITER as a continuation of (rather than a competitor to) the Japanese program. Such tensions between the wills and reactor plans of different national research groups on the one hand, and a perceived need for global cooperation to construct the next large fusion device on the other, would to a large extent shape the ITER project organization.

Compromise and reciprocity in science diplomacy

Across history the concept of reciprocity has been a core characteristic of diplomacy. The ideal of reciprocity implies equality in exchange, a balance achieved between negotiating parties. Each has to gain something and gain as equally as possible, although reciprocity does not imply that all parties involved are necessarily of equal standing. ITER is an example of so-called specific reciprocity, namely "situations in which specified partners exchange items of equivalent value in strictly delimited sequences" (Keohane, 1986, p. 4). The attempts to make sure that reciprocity was ensured during the negotiation and construction of ITER have, in turn, resulted in quite a few compromises at both technoscientific and organizational levels.

Compromise is another central concept in diplomacy, often seen as a tool of a "realist" mode of action. Reaching compromise can be construed as a success enabling cooperation to move forward, but also as a failure if taken in the sense of accepting standards that are lower than is desirable. Meanwhile, the concept has not been much explored in recent analyses of science diplomacy. Instead, many texts see science and diplomacy as two separate entities with radically different practices; they often refer precisely to the tension between the supposed realist necessities of diplomacy versus the idealist uncompromising aspirations of science. However, diplomacy has both idealist and realist aspirations, insofar as they can be separated, and so does technoscientific work. Particularly in Big Science projects such as ITER, decisions need to be based on both a scientific and a diplomatic rationale, and often these two are entangled. To understand the way in which the ITER project is organized, it is vital to explore its origins in reciprocity and compromise as well as the ways in which diplomatic and scientific rationales are entangled in the process of project negotiation.

The tension between the wills and reactor plans of different national research groups on the one hand, and a perceived need for global cooperation to construct the next large fusion device on the other (as outlined in the Stakes box), would shape the ITER project organization in at least three ways.

1. A decentralized procurement and construction organization

ITER uses a decentralized, in-kind procurement system, where participants contribute by constructing parts of the fusion reactor in their respective countries and sending them for assembly to Cadarache. Between 85 and 90% of ITER project resources are constituted in this way—a particularly high in-kind proportion for projects of this scale. First-of-kind components are manufactured by several different parties and then transported across the world to be assembled in less than millimeter precision according to a tight schedule on site in Cadarache. Only 10-15% of ITER funding goes directly to the main site; financial power as well as full control over procurement and construction rest with each of the participating national institutions. In the resulting network system, the weak central organization at Cadarache faces a difficult task of coordination.

Additionally, since the aim is to increase knowledge for all participants, the same component is often built simultaneously by several different parties. A single type of magnetic coil is manufactured in both Russia and China while constituent parts of the vacuum vessel, for example, are constructed in Europe and Korea, Russia and India. Akko Maas, Knowledge Management Officer at ITER, comments that the vacuum vessel "is the first safety barrier. (...A)sk any scientist, technologist, or safety person (...), they will tell you: you have to have the vacuum vessel fabricated by one single entity". Yet, at ITER, it is not.

In the early project negotiations of the 1990s, EU actors had argued for a model in which the collaborating parties pay into a central organization which then receives competing tenders and distributes work. However, a decentralized model was seen as the better choice by several actors. A payment system was put in place that did not require transfer of funds across borders: the ITER Unit of Account (IUA) thus remained independent of differing rates of exchange, labor and overhead.

Decentralized and simultaneous allocation of work, plus the shared "currency" of the IUA, thus became tools for equal division of labor and benefits between parties with vastly different labor contexts. Securing exact reciprocity and ensuring influence for all scientific groups involved, this system also addressed the tension between building knowledge and know-how across partners and completing an industrial reactor project. However, this exact reciprocity requires compromise in the form of weaker central management with less control over the complex construction process.

ITER building site in Cadarache, France, October 2021. Credit © ITER Organization, http://www.iter.org/

2. Siting and work organization

ITER's history has been plagued too by lengthy siting discussions. Settling on Cadarache as a building site took six years. Prior to that, the issue was not where the machine itself should be sited, but where a Joint Central Team should be located for the initial research work. Three of the four original parties (US, EU and Japan) stepped up for this scientific host role and none backed down during initial negotiations. A special group was therefore tasked to evaluate the different research sites, as well as the possibility of splitting the joint team over several sites. Despite their conclusion that the Joint Central Team should be concentrated at one site, none of the parties relented, and finally joint work was distributed over three different sites: one in Germany, one in Japan, and one in the US. The fourth party, Russia, for its part was formally designated as the site of the ITER Council. Here reciprocity signified compromising on not only project management but also the scientists' work environment, since scientists from all countries were to be stationed at each of the central sites. There, each national team also had an interest in ensuring that the scientific work had a close connection to their home program in order to legitimize participation in the project and defend their own research interests.

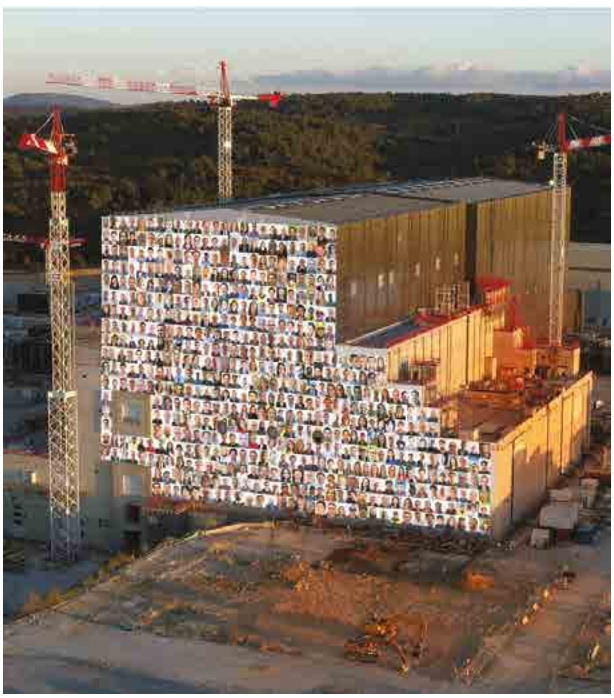
Consequences of this very complicated scientific and diplomatic distribution were staffing issues, leadership tensions between the main groups, and much travel between the sites. Further tension was found between what might be called the realist approach of the parties' formal agreement on hierarchical authority vested in site directors, and the ideal of consensual scientific decision making preached by most other involved groups.

A particularly challenging organization

The complex organizational set-up during the initial decentralized research period (1988-2005) included the ITER Council, the Home Teams, and the Joint Central Team divided over three different Joint Work Sites, as well as the permanent Technical Advisory Committee and Management Advisory Committee. The Home Teams had a local Home Team leader, while in each case the Joint Central Team deputy directors were appointed to a site outside of their own country, one of several ways of ensuring reciprocity through appointments of trust. Adding to the above was a plethora of contact persons, expert groups, special working groups, special review groups and specialized research groups, as well as contacts with industrial actors, and the fusion community at large.

3. Scientific specifications

As noted earlier, each party had their particular interest to defend in decisions on what ITER should do, according to their national energy policy and research specialties. Japan for example saw fusion as an important technology to help fill an urgent perceived energy need in the country, and drove towards a reactor capable of scaled industrial production. Meanwhile, most US researchers were in favor of smaller scale experiments on already existing machines to address some of the many unsolved scientific questions, and the Department of Energy did not consider it urgent to achieve a new energy production mode. The technoscientific discussions between the Technical Advisory Committee, Joint Central Teams and the Home Teams of the four parties aired divergent positions on materials, blanket construction, physics, interpretations of safety parameters, heat calculations, and resources allocated to parallel solutions. The differing national demands and competing interests led to conflicts regarding the scientific specifications of ITER, affecting too the size and cost of the machine. During the first years, plans grew to large proportions in order to accommodate all the wishes of the parties. In the end this growth became untenable, and design cost had to be cut by 50%, thus circumscribing the technical objectives as well.



The traditional all-staff photo reinvented during the global Covid-19 pandemic. Mosaic by EJF Riche. Credit: © ITER Organization, http://www.iter.org/

Conclusions: Living with reciprocity and compromise

To achieve a sustainable international collaboration capable of achieving the world's first full-scale demonstration fusion reactor, ITER needed to accommodate several difficult tensions. A primary tension was between the overarching aims of the project itself, and the particular objectives of the national research teams and industries. Another important tension juxtaposed the will to create and share new scientific knowledge, and the construction of a working industrial machine. Meanwhile, the complex technoscientific endeavor had to draw from many different research "assemblages" including various stakeholders, research communities and rationalities.

To bring the project into being meant arranging for reciprocity in order to ensure both political and scientific participation. Committed to the principle that all parties would find equal gain in the project, despite their differing social, political and economic contexts, both state negotiators and scientific project managers strove to identify solutions which, if far from streamlined, were optimal in that they could be accepted by all parties. In this way, diplomatic and scientific decisions on ITER are entangled.

Necessary compromise shaped political decisions about siting and procurement, and it continues to shape the everyday grind of backstage scientific and diplomatic work. All involved actors are affected. Organizational structure and, inevitably, practice flow from these principles of reciprocity and compromise, and the consequences of high-level decisions are dealt with on the floor, so to speak, at the different sites. Science diplomacy, therefore, is not a formal process restricted to a designated period of pre-project negotiation. It takes place in continuous efforts by actors both front-stage and back-stage to keep the ITER show running.

With new parties South Korea (2003), China (2003), and India (2005) joining the project, ITER has become one of the largest scientific collaborations in the world, and may thus be seen as a successful compromise in view of the achievements of the project so far. The consequences of the entanglement between diplomatic and scientific decisions, however, continue to influence the ITER project today. Many organizational structures of the early period have remained, including the current in-kind system which resembles the original simultaneous task allocation procedure. Leadership issues as well as the management complexity of the geographical split between the Home Teams, ITER institutions and the ITER site itself have continued to haunt the project and affect its work. The decentralized organization, in particular, was one of the main points of discussion during the assessment in 2015; what was a factor of sustainability can also be seen as handicapping the project and risking its goals.

As pointed out by the six students forming Team ITER at InsSciDE's Warsaw Science Diplomacy School (WSDS21), judging whether ITER should be seen as a success or failure is a difficult endeavor indeed. Despite its imperfections, the ITER project is proceeding, and the relationships between the parties have so far survived very difficult geopolitical situations. The compromises made are considered by many actors as necessary to reach the aim. As G.S. Lee, Deputy Director General of ITER (2015-2020) underlines: they had to "do it this way, deliver this way, or not do it... Either one is not very good, but the worst is not doing it".

In the case of ITER, science and diplomacy cannot be seen as separate entities with fundamentally different sets of values. The project shows that it is important to be aware of the entanglements of diplomatic and scientific decision making, in order to understand the effects of compromises in both areas. If we see science, research and development as something that cannot be the subject of negotiation and compromise, then science diplomats risk misunderstanding the consequences of their decisions.

"In the ITER Assembly Hall, the overhead bridge cranes are used to raise a 330-tonne toroidal field coil, tightly lashed inside the upending frame, to vertical. The coil will be moved across the Hall to join [a] vacuum vessel...". ITER, 25 April 2022. Credit © ITER Organization, http://www.iter.org/

For diplomats

• Power asymmetries can take various forms. One may have power in terms of resources, but not in terms of knowledge. One may have knowledge, but fewer resources. One may have, or lack, both. In a science diplomacy conte xt, it's important for actors to pay attention to the power asymmetries that may not always be as th ey seem, and understand that diplomatic choices will affect power and resource distribution in scientific communities.

• Science diplomacy takes place on multiple le vels, from high spheres of politics to work sites (handling of workforce, working togethe r, defending the priorities of each party). All of these levels may add to the negotiations, and one should be aware of how the y are each affected by negotiations.

For scientists and engineers

• There are always power asymmetries in all relationships, including scientific relationships.

• However, there are also tools for trying to decrease/lessen these asymmetries. At ITER, th ey were built into the organization: everyone has a vote, and the same power of decision; decentralization lets each party keep control over their finances while the IUA currency helps account for different production conte xts, etc.

• These tools also come with problems.

Overall

• Both diplomats and scientists may see science, research and d evelopment as something that cannot be the subject of negotiation and compromise. However , that is not true. If actors belie ve this, then science diplomats risk misunderstanding the consequences of their decisions.

• Consequences may be found in the various path dependencies (scientific, technological and organizational) that are created by science diplomatic decision making .

Study Questions

• Could the materiality of ITER – the fact that all partners in ITER are dealing with concrete objects – shape diplomatic discussions or set certain limits to discussions and participants?

• Does the ITER case illustrate the victory of national interests (economic, industrial) over common interests (advancement of knowledge and technology) or not?

• Using ITER as an example, what kinds of path dependencies are created, disrupted, or perpetuated by science diplomacy solutions?

• Do you consider the ITER organization as a success or a failure? What would you change?

• Should scientists advocate for institutions like ITER to open themselves to other countries (for example in Africa) that cannot currently contribute in kind due to lack of standing in the fusion field, in order to ensure more equal access to fusion technology?

Endnotes

• A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See Åberg A (2021) The ways and means of ITER: Reciprocity and compromise in fusion science diplomacy. History and Technology 37(1):106-124. doi.org/10.1080/07341512.2021.1891851

• Anna Aberg presents her study in an InsSciDE Warsaw Science Diplomacy School 2021 case video: www.science-diplomacy.eu/aiovg_videos/constructing-iter-reciprocity-and-compromise-in-fusion-science-diplomacy-wsds21-case-study/

• Cover image: The tokamak. Credit © ITER Organization, http://www.iter.org/

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Selected Publications

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Security for Whom?

Science Diplomacy and Security in EU-Africa Relations

An InsSciDE Case Study

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Security issues are interconnected with climate change impacts. In this study, two contradictory perceptions of security are set in opposition to one another in the context of European Union (EU)-Africa relations. The EU conceptualizes security in terms of border security, whereas the key issues for Africa and especially for Madagascar have been food, water, and finally human security. These two contradictory perspectives on security yield two different perspectives on science diplomacy. Despite the fact that the EU has ranked science diplomacy as a priority, the recent history of EU-Africa relations makes clear that the EU has not considered scientific evidence as much as it should. In contrast, a different form of science diplomacy has emerged from the main actors, Africa's and especially Madagascar's most vulnerable populations, despite the fact that they are almost invisible. They do not have the western diplomatic culture, but defend in terms of survival global solutions to global challenges.

Image credit: WFP/Tsiory Andriantsoarana

Keywords:

EU, Africa, Madagascar, global challenges, human security, border security

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Security for Whom?

Science Diplomacy and Security in EU-Africa Relations

The challenges that humanity faces include crucial physical and economic access to sufficient, safe and nutritious food (food security). Moreover, the capacity to safeguard sustainable access to adequate quantities of water of acceptable quality (water security) has been a huge problem for many populations. Additionally, the United Nations Development Programme claims in its recent report about the new threats to human security in the Anthropocene that "humanity's problem is not lack of ingenuity but an inability to see our security in the security of others" (UNDP, 2022).

The issue of security has been central also to European Union (EU) science diplomacy policies. In 2016 Carlos Moedas, the EU Commissioner for research, science and innovation, argued clearly that "EU science diplomacy evolved beyond science for continental strength to science for global hope. My goal is for the EU to expand beyond climate science for climate policy to climate science for peace and security" (Moedas, 2016). The key question in this study is how the above perspective has influenced EU relations with Africa, a continent with particular characteristics, vulnerabilities, opportunities, and prospects.

To address issues of security through science diplomacy, it is important to clarify what security means and for whom. It is widely accepted that the changes in climate patterns are a threat multiplier. Worst-case scenario models assuming business-as-usual approaches to climate change predict that nearly one-third of the global population will live in extremely hot climates and consequently uninhabitable places (Balsari et al. 2020). Our study will focus especially on Madagascar, an island country in the Indian Ocean, where food and crop security has become very seriously threatened.

In this context, we examine the implementation period of the 11th European Development Fund (EDF, 2014-2020) holding a budget of €30.5 billion. The 11th EDF's initial allocation plans were heavily affected by the so-called migration crisis of 2015, an event that became a milestone for EU foreign policy. The hundreds of thousands of migrants arriving in EU countries forced the EU to take immediate action. The management of these populations' movements dominated EU political and diplomatic discourse and also EU priorities and perception of security. After the agreement reached by the European Council and Turkey on 18 March 2016 closing the so-called Balkan route, EU focus switched to Africa, and the managing of the routes from this continent became a great priority.

Protagonists and actors

Studies that contain both general and specific perspectives contain actors that can be named and also others that are impossible to name but who should be recognized. The people who suffer in Africa and especially in southern Madagascar are the main actors of this study and also its motivation. EU and member countries' security forces and border workers are both important actors in the implementation of EU land and sea border security policies, their activity lying mainly behind the scenes of European political and social life.

A very crucial role is played for our study by two persons who granted interviews to the author. Firstly, Mr. Arduino Mangoni, UN World Food Programme (WFP) Deputy Country Director in Madagascar, shared his accumulated and direct experience about the current situation in Madagascar and the forces that drive the local populations to migrate. Secondly, Mr. Nikolaos Xydakis, Deputy Minister of Foreign Affairs in the Greek Government from September 2015 to November 2016 and also a member of the Greek delegation to the Valletta Summit on Migration, gave insight into this crucial meeting of Heads of States or Governments for which there are no published minutes. We also reference the words of a very prominent figure of African diplomacy, Dr. Nkosazana Clarice Dlamini-Zuma, African Union (AU) Commission Chairperson from 2012 to 2017.

"Tens of thousands of migrants still attempt to make the dangerous sea crossing from Africa to Europe in overcrowded and unseaworthy craft". –ICS, 3 March 2015. Source: www.ics-shipping.org

Technoscience: Scientific warnings

In 2015, the year of the so-called migration crisis outbreak, it had already become evident that the impact of climate change in Africa has been devastating. Since 1999, the UN Food and Agriculture Organization had estimated that almost 800 million people in the developing world were experiencing some form of shortage in food supply. Decreased rainfall was already observed in specific areas, and consequently agriculture would have been substantially affected. Moreover, the connection between hunger increase and climate change especially in Africa and southern Asia had been obvious at the turn of the new century. One of the most vulnerable countries in Africa is the island country of Madagascar. The World Meteorological Organization (WMO) in 2014 classified Madagascar as the world's third most vulnerable country to climate change. The UN WFP recently cautioned that southern Madagascar could become the site of the first-ever famine caused by climate change (United Nations 2021).

"Today, in the Grand Sud, in the southern part of Madagascar, there are, around rough figures, 1 million people in a situation of food insecurity, including around 300,000 children who are malnourished" - UN WFP Deputy Country Director in Madagascar A.Mangoni, interview with the author, 1 April 2022.

The Intergovernmental Panel on Climate Change (IPCC) report in 2020 affirmed that food insecurity driven by climate change is one of the primary threats to human life. Certain places in Africa are becoming uninhabitable under the current food and water security conditions, including southern Madagascar. Evidence and warnings that were published long before the current emergency situation had nonetheless created the ground for strong predictions and also for strong preventive actions. Mr. Mangoni stated his certainty that "definitely [this situation could have been avoided]. On the one hand, you have the combination of different elements, climate, COVID, inflation, banditry, etc. On the other hand, you have similar phenomena in other countries and the consequences are not so dire. [This emergency situation is] a combination of [these] elements and of the poor infrastructure and the existing vulnerabilities of the people living in poverty (food insecurity, chronic malnutrition etc.)".

The Valletta Summit as the reveal moment

The tipping point was the Valletta Summit which took place on the 11th and 12th of November 2015 in Malta. This meeting of the Heads of States or Governments of all EU countries, many African countries, and trans-African organizations resulted in a Political Declaration, an Action Plan and, most importantly, the EU Emergency Trust Fund for Africa (EUTF).

A first crucial point was enunciated by African Union Commission Chairperson Dr. Dlamini Zuma. Initially, she underlined the urgent need for legal migration policies and measures: "There is no part of the world that can be a fortress. We should be open to legal migration". Moreover, she strongly opposed the EU's willingness to construct processing centres for people who want to reach Europe. The AU Chairperson was precise and strict: "The AU is not in support of, and cannot endorse the establishment of the so-called processing centres in Africa. The processing centres, or whatever they may be called, are de facto detention centres that will constitute a serious violation of human rights and the re-victimization of migrants. Especially women and children would be at great risks of falling prey to rape and human trafficking, including the trafficking in human organs".*

Undoubtedly, a second crucial point identified during the Valletta Summit which concerned the implementation of EUTF was the role that the specific countries and each continent had in making decisions. The representatives of the concerned African partner countries and regional organizations were invited to participate only as observers, with no active role in the decisions affecting their countries.

A third point – and the most important issue for this study – is that during the Summit and concerning its decisions, the scientific evidence regarding the impact of climate change in Africa was not taken into consideration in the discussions and decisions.

* au.int/en/newsevents/20151113/valletta-migration-summit-no-part-world-can-be-fortress-we-should-be-open-legal

Valletta Summit on Migration, 2015. Image credit: European External Action Service, CC BY-NC 2.0 (cropped). www.flickr.com/photos/eeas/22950022112

The notion of security in narrow limits

Political discourse and decisions, and relations with migrants' countries of origin or transit countries, all shape the EU search for governance tools regarding movements in almost every part of the Mediterranean Sea. Concepts include migration corridors, hotspots and processing centers in African countries. EU financial instruments also play a critical role. Migration governance has grown in relation to the broader spectrum of EU-funded activities in African countries, as seen in both budgetary increases and adjustments to existing frameworks, such as the launch of the EUTF.

The EUTF was targeted to countries of three specific regions in the African continent, all considered to be under geopolitical transformation: a) the Sahel and Lake Chad; b) the Horn of Africa; and c) North Africa. Some of these countries have been the countries of origin of the vast majority of migrants, and the others are found along the migration routes to Europe.

The main source of funding for the EUTF was the 11th EDF, initially foreseeing just €1.8 billion for dozens of countries with huge populations and vulnerabilities. During the Valletta Summit, the representatives of African countries argued that this amount was much less than Turkey alone had received in the past two years. Mr. Xydakis recalled that they criticized it as ridiculous, full of "pain and agony". Finally, €5 billion was allocated to the new fund, of which €4.4 billion came from the EDF and other existing EU financial instruments.

Migration is a long-term phenomenon. The majority of persons who have been forced directly or indirectly to leave their homes seek to move to neighboring countries and regions within Africa. According to the International Organization for Migration (IOM) in 2020, 80% have migrated within Africa. Concerning those who finally reach other continents, 26% live in Europe in search of better opportunities and stability. In 2015, the fund for migration management EUTF wasn't dedicated to supporting the integration of those who had entered Europe but was rather used to deter new arrivals. As Mehari Taddele Maru, former program coordinator for migration at the AU Commission pointed out, the EUTF "had to do more with Europe than with Africa, because for Austria to host 40,000 irregular migrants is more worrisome than for Uganda to host 1.3 million refugees".*

The perception of migration management only as a border security matter and the creation of a "human filter" deep inside Africa cannot address the roots of this issue. If we consider that the programs that implement the above perspective are funded indirectly by the main developmental fund through the EUTF, the EDF's aims to reduce poverty and support governance improvement appear also to have been undermined. The initial declared goals of EUTF seem more like an effort to justify the absorption of the funding from a developmental fund than goals which could have been achieved in the short implementation period of the EUTF. Of note was the reaction of the European Parliament's Committee on Development (DEVE) condemning "any use of EDF and ODA (Official Development Assistance) funds for migration management and control and any other actions without development objectives" (Barana, 2017).

Additionally, this instrument divides North and Central Africa into three regions and groups countries with different needs and challenges on the basis of their role in migration routes. The importance of external funding for the African countries redefines the relationships between them in the context of a categorization that serves the aims of the donor. Actually, it sets an unofficial criterion on the basis of the number of migrants that each country "produces" and who finally reach Europe. The EU defines its relations with African countries in the framework of border security and external intervention in the African countries' internal affairs through the policy of constructing processing centers. This situation after 2015 brings the EU closer to the countries that have received funding – geopolitically although not economically or socially (Zardo, 2020).

* www.dw.com/en/how-the-eu-spent-billions-to-halt-migration-from-africa/a-61362906

If the EU continues to be at odds with the scientific warnings and the global need for common and global solutions, the problem for the African populations will become harder and gradually more uncontrollable, if it has not already become so. The EU perceives security in a local and internal way that drives short-term solutions for a problem that it has itself fostered. The lack of efforts to answer the questions about the chronic causes that force local populations to migrate and also the EU and western countries' responsibilities is remarkable. The Commission Chairperson pointed out, according to the online report of the Valletta Summit by the AU, "the need for short, medium and long-term sustainable solutions, highlighting the fact the situation cannot be resolved through quick fixes". She claimed that Europe should align with the AU's Agenda 2063 which aims to create a better environment for African young people through the improvement of the industrial sector, the skills training, and the entrepreneurship opportunities (op. cit.).

Science diplomacy at a crossroads

The two contradictory perspectives of security presented in this case study, and the way the EU and the less developed African countries perceive scientific evidence and warnings, yield two different perspectives on science diplomacy. As EU Commissioner Moedas claimed in 2016, the EU prioritizes science diplomacy "in a spirit of international solidarity". However, these priorities concern only EU relations and cooperation with countries with similar development rates that could lead to a win-win situation. In one of the most important tasks, the adaptation to climate change by the most vulnerable populations and the responsibilities of the wealthier countries, the EU seems to avoid its declared priority of science diplomacy. Even in 2015, the way that the EU acted to achieve an agreement with Turkey was totally different from diplomatic actions before, during and after the Valletta Summit. As Mr. Xydakis pointed out in our interview, the agreement has bound both parties politically and has channeled huge financial resources from the EU to Turkey in order to block the population movements.

EU relations with the majority of African countries and the migrants' countries of origin or transit countries in Africa appear then in contrast. In this context, the notion of security is not something that has been negotiated at the highest level. Even at the Valletta Summit, the discussion and decision-making process were structurally biased, unilateral and practically unnegotiable. The African representatives did not have equal standing with the Europeans, and there was no participation by any international scientific organization in order to underline the urgency of adaptation to climate change. Consequently, one of the most crucial roles in the implementation of the security policies has been given indirectly to EU and member countries' security forces and border workers. This is not widely acknowledged as such because this process takes place mainly behind the scenes of European political and social life.

While crisis is considered an abnormal event that demands urgent management to return to the pre-crisis situation, the recent history of the Mediterranean region reveals repeated crises (Jeandesboz et al. 2016).In fact, this "constant crisis" situation reasserts the permanent need for population movements away from places becoming gradually uninhabitable under the impacts of poverty and climate change. Yet these impacts have already been scientifically predicted. Our case points to the abandonment of urgent scientific evidence in order to serve political and diplomatic aims, done in the name of crisis. The recent crises are situated at the beginning of a new long-lasting situation which cannot be resolved by a short-term crisis management approach.

On the other side of this unbalanced but bilateral relation, there is a different and less discussed, studied, or well-shaped perspective on science diplomacy. Diplomacy is understood today to include, inter alia, varied actions, professionals, habits, and styles of communication. In the case of the less developed African countries, it is inspired by the local needs and the urgency that food and water insecurity have created. Recent experience, scientific evidence, and warnings about the near future have determined the political and diplomatic discourse of the African countries' representatives; this discourse, their de facto exclusion from decision making, and their pain, anger and rage about the proposed policies, shape a totally different kind of science diplomacy. The Valletta Summit displays the challenge of representation in the diplomatic field, especially in transnational relations with huge power imbalances.

The current situation in southern Madagascar is indicative of the above anguished appeals from the African community. They call for those priorities that the field of science diplomacy declared at its beginning. In this context, the African actors should gain the role that they deserve in the global science diplomacy field. Finally, the African countries' diplomacy could be perceived as an urgent call for global science diplomacy that, in parallel to contributing to global solutions, also contributes to the expansion of the African countries' scientific capabilities.

Conclusions and reflections

The role of the scientific predictions that have come true and the expected increased emergency have determined science diplomacy strategies in the era of climate change on the part of those who have contributed the least to its causes but are suffering most from its effects. They use the knowledge that has been produced mainly in the western universities in order to point outthe need for a different approach to this urgent situation. This does not happen in order to improve their position in a diplomaticfield but to discuss in terms of survival and to push the wealthier countries to take the responsibility that properly belongs to them.

Examining the case of the Valletta Summit and the emergency situation of southern Madagascar leads us to reflect on the status of science diplomacy. In this context, we would suggest that the EU should reestablish its science diplomacy strategies in EU-Africa relations, if there is truly a profound motivation to be consistent with Commissioner Moedas' initial declarations on science diplomacy. Only a perspective on security as the protection of global populations, in a multinational context, can contribute adequately to global solutions to global challenges. This overcomes a perception of security only as "our" security and encompasses the security of "others".

In this specific case, "others" are those who derive from the other side of the militarized Mediterranean border, with different cultures, from a place that for many Europeans practically does not exist. In an era of uncertainty, the prioritization of diplomatic aims should take place on a strong scientific basis, and science diplomacy should provide a strong cover to the uninterrupted and unaffected production of scientific knowledge in order to contribute to prevention, mitigation, and adaptation in the face of climate change. As Mr. Xydakis said of the Valletta Summit, "the gap between the vital interests of the north and the south was so huge that you could see the limits of diplomacy". Responses to Madagascar's droughts and famine-like conditions make clear that security has been increasingly perceived by the EU as necessarily focused on migration management, and EU-Africa relations are increasingly confined to this issue. In this context, the EU and science diplomacy in general should learn from this recent and ongoing situation in order to effectively manage the upcoming challenges which crucially require a strong collaborative perspective. Science diplomacy scholars have the duty to avoid reducing science diplomacy to a meaningless notion or, even worse, a notion that deviates from its initial foundation, thereby missing its potential to change the game in the face of global challenges.

Severe drought in southern Madagascar has dried river beds and farmland. Photo: World Food Programme/ Shelley Thakral

Takeaways

• The effective management of climate change impacts and the needs of the most vulnerable populations overwhelm the EU science diplomacy strategies.
Science diplomacy that includes the main actors could be a powerful tool in the effort for more effective adaptation and mitigation measures.

• Scientists should contribute to reducing asymmetries in the decision making on solutions to global challenges.

• The way of enacting science diplomacy from the perspective of African countries should be studied more effectively and deeply. Science diplomacy exists even in contexts different from the western contemporary one.

• As science diplomacy studies expand and become wider, a new kind of science diplomacy should be promoted and studied across the most vulnerable countries in a framework of self-protection.

• A more effective integration of the scientific warnings about current and future effects of climate change into the shaping and implementation of security policies should take place. Only a perspective on security as the protection of the global population, in a multinational context, can contribute adequately to global solutions to global challenges. This overcomes a perception of security only as "our" security and encompasses the security of "others".

Study Questions

• Which elements of science diplomacy should be engaged to address root causes forcing African populations to migrate from their homes? Will science diplomacy be enough? What obstacles does it face?

• How have the deeper aims of security policies affected the scientific outcomes and technologies that concern European border protection and security? Who have been the main protagonists of this process?

• Can scientists foster more effective integration of the scientific observations and warnings of climate change impacts into the shaping and implementation of security policies?

Endnotes

Based on unpublished interviews conducted by Sotiris Mikros with:

- Xydakis, Nikolaos, 16 February 2022 (in person, Athens)
- Mangoni, Arduino, 01 April 2022 (online)

• A fuller version of this InsSciDE work will be forthcoming in a peer-reviewed journal.
Mikros S (in preparation) Security for whom? The perception of security in EU-Africa relations.

• Cover image: Kids in Amboasary, southern Madagascar. The World Food Programme states: "In Amboasory, 14,000 people are estimated to be at Catastrophe level of hunger on the Integrated Food Security Phase Classification". Image credit: WFP/Tsiory Andriantsoarana. www.wfp.org/stories/dont-look-other-way-madagascar-grip-drought-and-famine

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Sotiris Mikros

Sotiris Mikros recently joined the research team of the chair of science and technology and gender studies at Friedrich Alexander University Erlangen-Nuremberg as a PhD student in the field of science and technology studies. He studied physics and environmental science. He holds an MSc in management of natural and human induced disasters, and a second in political science and history. Through his work, he aims to make visible the interactions between scientific knowledge production and circulation in environmental issues and socio-political dynamics.

Selected Publications

(2020) Lignite phase-out in the frame of just transition. The case of Western Macedonia. MSc dissertation (in Greek). Harokopeio University Library and Information Center ESTIA, Athens. https://estia.hua.gr/browse/23610

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Environment

Environment:
Monitoring as an Arena for Science Diplomacy

Nina Wormbs (KTH) and case study authors

The InsSciDE work package on "Environment: Monitoring as an Arena for Science Diplomacy" is concerned with how we view and understand the environment at particular times, particular places and for particular reasons. According to Libby Robin et alia, the environment took on its present meaning after World War II when pollution and degradation became more and more apparent and serious. The environment became something vulnerable and in need of protection, an image that is apparent in all the five cases of the work package.

The work package has taken the "monitoring" of environment as an entry point for the different case studies. This means that we take seriously the work needed to get data on the environment in order to envision and describe the environment. The resulting environments can at times be regarded as the product of science diplomacy; or they can be the starting point for science diplomacy. Furthermore, environmental monitoring is a site of both present transgressions and potential future threats that cause diplomatic problems, and science is central to understanding both.

The five cases presented here are connected both thematically and empirically. Media and communication studies scholar Miyase Christensen investigates the most recent case, dealing with communication efforts of the Arctic Council, which is an intergovernmental body that undertakes numerous environmental assessments in the extremely exposed region of the Arctic. Nina Wormbs, historian, shows how different models of science diplomacy are played out in the ways that Indigenous knowledge is included in the work of the Arctic Council over the last 25 years. Social anthropologist Jean Foyer, together with David Dumoulin Kervran, writes on the action of Indigenous people in the COP 21 meeting leading up to the Paris agreement in 2015, detailing the different narratives of Indigenous roles and knowledge in the context of climate change. Historian Sam Robinson discusses the imaginaries of the ocean which shaped ideas of the future as well as policy, law and science diplomacy in the 1960s. Finally, historian Simone Turchetti complicates the discussion on science diplomacy by analyzing the policy effects of the 1980s prediction of a nuclear winter that would emerge in the case of a nuclear explosion. This discourse has faded from the public sphere, but other catastrophic scenarios have not.

Each case brings new dimensions to our understanding of science diplomacy, at times also invoking the term environmental diplomacy. These multifaceted analyses owe much to the rich and varied empirical material used in the research, and can contribute to the expanding critical discussion on science diplomacy in general and in environmental communication, environmental governance, and environmental science in particular.

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

Communication and Diplomacy:

The Arctic Council's Communication of Science on Social Media

An InsSciDE Case Study

Miyase Christensen
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Technodeterministic and technoromantic understandings of the role of companies such as Facebook and Twitter have ascribed to these platforms powerful transformative roles in processes of social change. Recent research, however, has emphasized the need to analyze their influence within broader social, economic and political contexts. It is necessary to consider the platforms' place within broader media ecologies, the actual levels to which users employ the platforms to bypass established media outlets (disintermediation), and whether mere presence online translates into use and impact. With these issues in mind, we examine the Arctic Council's (social) media use in the service of science communication, its benefits and limitations, and the place of social media in the broader science diplomacy media ecology.

Source: @ArcticCouncil

Keywords:

Arctic Council, social media, public sphere, science diplomacy, Facebook, Twitter

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

Communication and Diplomacy:
The Arctic Council's Communication of Science on Social Media

Within the broader media ecology of science diplomacy, what role can large-scale social media platforms play? To what extent has technoromanticism masked the reality of the use of these platforms? When science diplomacy is communicated via social media, what choices are made?

In May 2017, at the tenth Ministerial Meeting of the Arctic Council in Fairbanks, Alaska, the foreign ministers of the eight states with Arctic territory signed the Agreement in Enhancing International Arctic Scientific Cooperation in order to "enhance cooperation in scientific activities in order to increase effectiveness and efficiency in the development of scientific knowledge about the Arctic." This foundational text, coming ten years into the existence of the signatory Council, "enhances the logistic capacity for cross-cutting knowledge discovery and application" (Berkman et al., 597). The Arctic Science Agreement is in and of itself an iteration of science diplomacy. On the relationship between science diplomacy and the Arctic Council, Binder (2016) wrote:

Science for diplomacy describes the soft power approach states follow through strengthening their scientific capabilities, achieving additional attraction and in consequence developing the availability to shape preferences and policies (...). Most prominently, cooperation agreements and the creation of institutions are used as an instrument to promote deeper political ties through scientific collaboration. The Arctic Council serves as a good example for this dimension, as the cooperation on environmental protection within the Arctic Environmental Protection Strategy (AEPS) in consequence led to the foundation of the AC.

A central component of science diplomacy is communication, and communication of that diplomacy to the public in general, and to stakeholders in particular. Social media have often been pitched as platforms with the potential not only to reach large numbers at relatively low cost, but also to allow bypassing of mainstream media outlets to achieve enhanced dialogue and discussion with various publics. How this social media potential for reach and impact on the public sphere has played out in practice, however, is another issue. As opposed to earlier, technodeterministic and technoromantic understandings of the role of social media in which these platforms are ascribed powerful transformative roles in processes of social change, recent research has emphasized the need to analyze their influence within social, economic, and political contexts. In other words, we must consider their place within broader media ecologies, the actual levels to which users employ the platforms to bypass established media outlets (disintermediation), and whether mere presence online translates into use and impact.

With these issues in mind, we analyze a sample of the communication from the Arctic Council on the topic of science and scientific cooperation, published/posted after the signing of the Arctic Science Agreement. We address the benefits and limits of (social) media use in the service of science communication, the place of social media in the broader science diplomacy media ecology, and also the asymmetries in knowledge and information awareness.

Protagonists

Analysis of the use of large-scale international social media platforms for the dissemination of information regarding science and science diplomacy is faced with a dense web of organizations and individuals to take into account. A useful way to think about this web is to weigh the relative amounts of power the different protagonists have in relation to the mediated communication in question, as well as their power over its filtering into the public sphere (through creating content and online discussion).

- **Social media platforms:** Organizations (usually) without direct input to or view on the information, but which provide the potential material access to large-scale publics, and through site architecture shape the form of communication in a highly fragmented media ecology.

- **Arctic Council:** The organization that hires the individuals responsible for making decisions regarding which material to post on the various Arctic Council social media pages, how and when.

- **Members of the scientific community:** Those who participate in the science diplomacy covered, and/or produce the scientific output presented on platforms by the Council.

- **External stakeholders:** Governments, non-governmental organizations (NGOs), rights activists either consuming or providing the material communicated on the sites.

· **Media:** Large- and small-scale media outlets that read the material posted to social media platforms or, more importantly in relation to power over content, share in some form with their followers the material posted, or produce articles shared by the Arctic Council on its pages.

· **General population:** Users of the social media platforms (or those exposed to its content) unaffiliated with any of the previous groups.

The Arctic Council and the communication of science diplomacy on social media

Fedoroff (2009) defined science diplomacy as "the use of scientific collaborations among nations to address the common problems facing 21st century humanity and to build constructive international partnerships". In the case of the Arctic, a number of specific areas have been identified as central to such partnership: sustainable development, environmental protection, balancing economic prosperity, and overall societal well-being.

The Arctic Council, established in 1996, defines itself as "the leading intergovernmental forum promoting cooperation, coordination and interaction among the Arctic States, Arctic Indigenous peoples and other Arctic inhabitants on common Arctic issues, in particular on issues of sustainable development and environmental protection in the Arctic." In addition to the eight member nations of the Arctic Council (Canada, Denmark, Iceland, Norway, Russia, Sweden, the United States and Finland – together with the Faroe Islands & Greenland, part of the Kingdom of Denmark), there are also six "Indigenous Permanent Participant organizations" and 35 "observer states and organizations."

In this case study, the communication from the Arctic Council on the topic of science and scientific cooperation, published on Twitter and Facebook from May 2017 (after the signing of the Arctic Science Agreement) up until October 2021, was analyzed with an eye to discerning the benefits and limits of (social) media use in the service of science communication, and the place of social media in displaying cooperative efforts.

Stakes

The communication of science diplomacy on social media platforms has direct consequences for the dissemination of information not only in the service of (science) diplomacy, but also for public debate. With dissemination and engagement, however, come both benefits and possible pitfalls.

· The use of social media by the Arctic Council to communicate and present scientific research and cooperation in the service of science diplomacy is fundamentally linked to the relationship between citizenship and governance. This use conveys that the actions of states conducted in the name of citizens are presented in an open and transparent manner, and that this openness and transparency are benchmarks in and of democracy. Conversely, an absence of communication, or communication that fails to either inform or engage, runs the risk of not only bypassing citizens, but also of undermining efforts to leverage science diplomacy in the service of broader cooperation.

· The general failure of the Arctic Council to stimulate any real sense of engagement or public debate on or through their social media channels when addressing issues of science is perhaps unsurprising, given the topic of the communication (specialized scientific issues). Yet the low levels of discussion or interaction beg the question of what is being missed through these low levels, and what the Arctic Council sees as the ultimate purpose of the communication of scientific cooperation via public channels beyond simple "internal" communication. While engagement with communication on science diplomacy is most likely to be found among those in the diplomatic and scientific communities, the long-term impact of that science – particularly in the case of the Arctic – has implications down to the local grassroots levels. Thus, communicative feedback loops involving these groups, though platforms such as social media, could prove key. Recent examples of the use and power of social media platforms in politics (the US being one such example) and their role in democracy are significant here.

· Finally, an element that did not come out of the research on the Arctic Council's use of social media (due to lower levels of interaction), but has a direct bearing on the stakes involved in such use, is that of the balance between the benefits of public communication on social media platforms versus the potential pitfalls of such communication. While the democratic potential of open communication and discussion is self-evident, a factor worth considering is how debate on social media platforms can often degenerate into aggressive, nationalistic, or otherwise divisive narratives that can not only stray from the original purpose of the posts, but can possibly undermine them.

Arctic Council communications: Strategy, stakeholders and social media

In the Arctic Council Communications Strategy (2020) it is written that one of the Arctic Council's primary purposes is to "disseminate information, encourage education, and promote interest in Arctic-related issues," and that, "in the face of an ever-shifting communications landscape, [the Arctic Council communication] strategy will guide the Council towards generating positive narratives – as a strategic effort – on Arctic cooperation, environmental protection, sustainable development, and the well-being of Arctic residents." The main goals and objectives of this communication are stated thusly:

• to strengthen the Arctic Council brand and underline its relevance;

• to provide a credible "voice" for the Council on issues where it has achieved consensus and furthered the knowledge-base;

• to highlight how the Arctic Council actively contributes to positive outcomes in the Arctic - notably through the substantive and high-quality work of its subsidiary bodies;

• to illustrate that the Council, its working groups, and their projects respond to and address on- going regional priorities and global crises;

• to generate a positive narrative of international cooperation on sustainable development and environmental protection in the Arctic;

• to facilitate timely communications efforts and media responses to position the Arctic Council as the leading and authoritative voice of the region.

The target audiences for the Council's communication are identified in the strategy as: (1) inhabitants, including Indigenous peoples, of the Arctic and the Arctic States; (2) the Arctic Council network; (3) policymakers in the Arctic States and observer states; (4) Arctic-focused NGOs, interparliamentary and intergovernmental organizations; (5) the Arctic scientific and research community; (6) business sectors with interest in the Arctic; (7) ***youth***, including ***students***, from the Arctic and from Arctic States (emphasis ours); and (8) media representatives and the general public. While the Council identifies a number of possible communication tools, "digital media networks" (including social media) are defined as serving to "amplify messaging and reach key audiences – notably ***opinion leaders***, ***journalists***, and ***youth***" (emphasis ours).

The Arctic Council has social media pages on Facebook (created 2014, 10.8K followers), Twitter (created 2012, 22.5K followers), Instagram (created 2020, 2.3K followers), Flickr (created 2011, 78 followers) and pages on Vimeo (created 2011, 53 followers) and Soundcloud (created 2015, 30 followers). We focused our study on the use of Facebook and Twitter (the platforms with the greatest reach) by the Arctic Council for the posting of material that made clear reference to science or research.

Social media and science diplomacy: The place in the overall social media flow

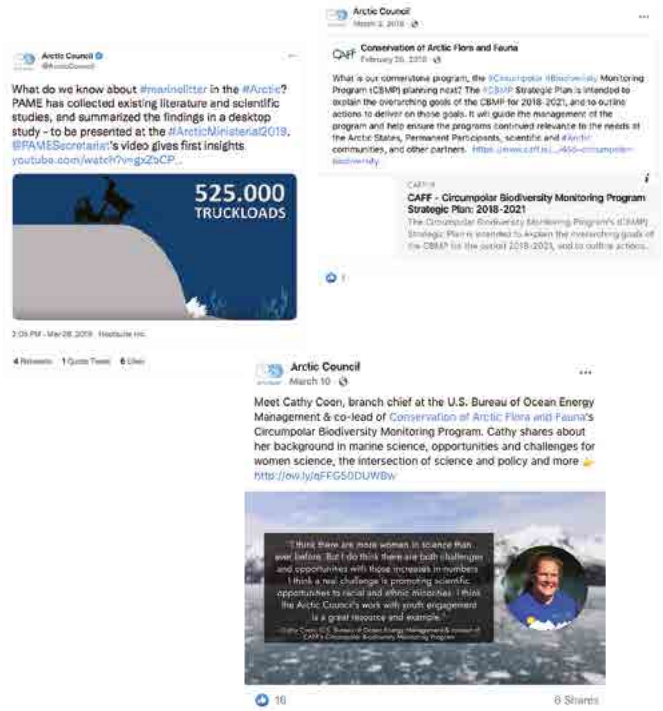
We selected our sample for analysis through performing a search on Arctic Council social media postings between May 2017 and October 2021, using variants of the words *science*, *scientific*, *researchers*, and *research*. This selection was justified by our suggestion that communication about scientific activity and research both enhances existing cooperation and fosters further cooperation.

At the most general level, we can say that Arctic Council social media content with explicit reference to those search terms of science and research made up a relatively narrow portion of the social media content that was examined. On Twitter, for example, of over 3,000 tweets posted by the Arctic Council in our sampling period, some 5% made specific reference to these terms. Facebook content with explicit references to these terms was equally scarce. While there were undoubtedly posts on both platforms that included information on science and science diplomacy that were not captured by our sample, our aim was to identify clear and explicit reference to science and research. This interest in clarity and specificity was motivated by the fact that the Arctic Council made reference to groups such as "journalists" and "youth" as being particular targets of social media communication – that is, groups falling outside of scientists, diplomats, experts and other "insiders" who would be more informed about Arctic Council activities, and thus less in need of (or using little) specified terminology. (Conversely, the fact that there is communication about forms of science diplomacy that do NOT make mention of those terms might illustrate an inward-looking focus of/for the use of the platforms by the Arctic Council; however we did not assess this possibility.)

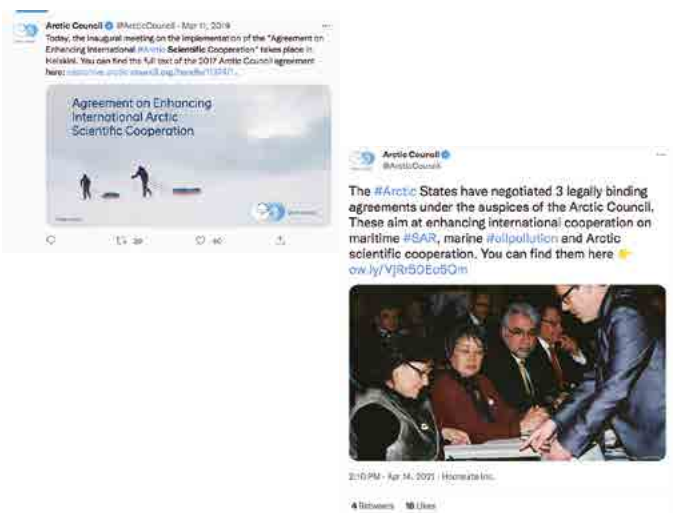
Forms of content

While difficult to cover all of the forms of science/research content communicated on the Arctic Council's Facebook and Twitter pages in a limited amount of space, three examples serve as illustrations of how the platforms were used to communicate science/research efforts and cooperation.

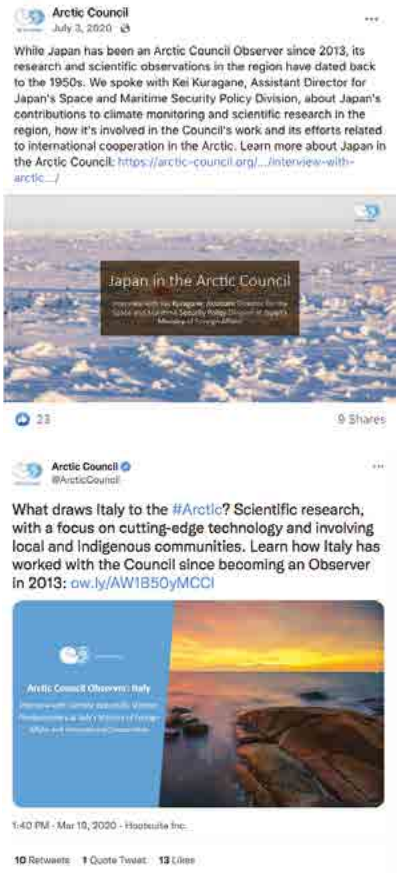
• Example 1: ***Promotion and communication of Arctic Council (and related sub-divisions) scientific meetings and gatherings.*** This form of communication is the most common across the social media accounts. In these Facebook postings and tweets, the Arctic Council highlighted the scientific work done under its auspices. The posts link to Council-sponsored or connected events and make reference to individuals or organizations working on collaborative projects.



• Example 2: ***Promotion and communication of the Arctic Council in general as a venue for scientific collaboration.*** In this second general category, the Arctic Council posts regular reminders on their accounts of the role of the organization in promoting scientific collaboration and cooperation. These posts are usually non-specific in the sense that they are not linked to a particular scientific event or research project or publication, but rather to the work of the Council.



• Example 3: ***Promoting the expansion of science diplomacy in the Arctic beyond traditional Arctic geographic borders.*** In this category, the Arctic Council used its social media platforms to communicate the scientific cooperation and collaboration of nations whose borders fall outside of the Arctic region.



• Example 4: ***Linking science (diplomacy) and Indigenous issues***. A final example of the use of social media for promoting science diplomacy was the way in which the Arctic Council communicated the organizational links between science and Indigenous rights/issues. While a diverse cross-section of issues was used by the Arctic Council in relation to science and research, the connection to Indigenous populations emerged as an important theme.

Low levels of engagement

The social media posts from the Arctic Council on Facebook and Twitter were marked by a relatively low level of interaction – defined on Twitter as Re-tweets, Favorites, or Responses, and on Facebook as Shares, Likes, or Comments. Most Facebook posts and Tweets received in the region of 0-20 forms of sharing/liking engagement, and most had even lower direct commentary in the form of responses and comments. Many tweets garnered no engagement at all, and the vast majority of Facebook posts had under 10 comments (and most less than five). The tweets and posts that generated the greatest degree of interaction were, for example, those initially announcing the signing and/or start of the *Agreement* in *Enhancing International Arctic Scientific Cooperation* in 2017 (signing) and 2018 (implementation).

While levels of engagement with messages about science and/or research in the form of Retweets, Favorites, Responses, Shares, Likes, and Comments were low compared to other posts on the Arctic Council's Twitter and Facebook accounts, another direction of engagement came in the form of the Arctic Council itself re-tweeting and re-posting material on the two platforms produced by other users. On Twitter, the Arctic Council tended to re-tweet material of direct relation to Arctic Council events and/or programs where the Arctic Council was named.

It should be noted that the low level of engagement in relation to Arctic Council social media content on the subject of science/research was not unique. While not a central focus in this case study, the overall levels of engagement with the Arctic Council's social media content are (and were) at roughly the same levels as the posts on science and research. In other words, the science/research posts did not markedly out- or under-perform the other content posted by the Arctic Council. Of the over 4000 tweets sent by the Council during the four years under analysis (on all subjects), only 25% received 10 re-tweets or more, just 15 received over 50 re-tweets, and not a single tweet out of 4000 got more than 91 re-tweets.

Connection/connecting to mainstream media outlets

While one of the stated objectives of the Arctic Council in relation to its social media posts was to increase information and engagement with "journalists," the Facebook and Twitter accounts of the organization showed little evidence of having generated such engagement to any significant degree. Twitter and Facebook posts were rarely shared by national and/or local media outlets, and the Arctic Council did not make use of "tagging" media – placing the username in the body of the post or tweet in order for the post to be placed in the user's feed where it would likely be seen – in their posts on either platform. Similarly, the Council very rarely shared any articles or material produced by external media companies, be they local, regional or national. There was an apparent policy in the posting of material to the Arctic Council accounts that the vast majority of links go directly to the Arctic Council website, the websites of Arctic Council-related divisions, or to government agencies/departments of Arctic Council member or observer states/regions. Outside media were not used as relays or as sources of material.

Discussion and conclusions

What does the use of social media by the Arctic Council tell us about the relationship between science diplomacy, technology and the public sphere? In order to address these issues, we shall use a number of key theoretical concepts as frameworks for discussion.

Media ecology: The concept of media ecology encourages scholars to consider the total communicative make-up of a given media environment and the relationship between the different components of that environment, rather than looking at each communicative form/act or medium in isolation. While the present case study examined just two social media platforms, their role in the broader media ecology within which science diplomacy is communicated is of particular importance. What is apparent from the study is that the Arctic Council has not attempted to make its social media accounts important nodes in a much wider communicative network. While the accounts certainly link to governments, governmental agencies, NGOs, universities and research groups, the lack of engagement/interaction with local, regional and national media outlets (or other non-journalistic media) makes their role in the broader media ecology somewhat peripheral. Thus these platforms are nodes in only a specialist/specialized communicative diplomatic and scientific communication ecology, which does not itself display great engagement.

Disintermediation: The peripheral place of the Arctic Council in the broader media ecology is linked to the notion of disintermediation: the extent to which individuals or organizations bypass mainstream media and utilize platforms such as social media to target the general population; or, conversely, the extent to which they use the mainstream media to spread and amplify their messaging. As noted, the Arctic Council's social media use showed little evidence of an attempt to engage mainstream media outlets through its posts, or to encourage amplification of its messages on science diplomacy through direct or indirect social media contact. Whether this practice is intentional or unintentional is an issue for further research (i.e. semi-structured interviews), but the fact that connecting with journalists is a stated communication goal suggests that the mediation of Arctic Council material on science diplomacy is not viewed as undesirable.

Technological determinism and **solutionism**: In its rationale for use of social media, the Arctic Council identifies "opinion leaders, journalists and youth" as key groups with whom contact is desired. Yet the relatively inward-oriented content of the material posted to the social media platforms on science and research, as well as the low levels of interaction, suggest the possibility that techno-determinist and/or solutionist perspectives are at play: namely the notion that technology is used because it is there, and not u sing it would therefore seem like a failure; that the mere use of the technology will solve problems (i.e. put information out there, and it will be found); and, finally, that technology not only offers solutions to every problem that we have (in this case "reaching youth"), but that the creators of technology generate false problems that can then only be "solved" by the technology they create. A narrow technological determinist or solutionist view, therefore, might serve to hinder more open, progressive, and alternative modes of communicating science and science diplomacy.

The public sphere: As a final point, the case study begs the question: What is the role of the "public" in this digital public sphere? Or to put it another way: where is the "social" in social media? International research and science cooperation communicated by the Arctic Council in this case study centers around a region facing potentially catastrophic consequences as a result of climate change. Thus, the science diplomacy in question, and the science that may spring from or through that diplomacy, has clear material implications for large numbers of people living in situations marked by extreme precarity. The relative lack of contact and engagement with broader publics (beyond scientific and/or diplomatic specialists) via social media platforms is therefore an element also worthy of further discussion, and one that links science diplomacy with the ethical responsibilities of citizenship and democracy.

Study Questions

• How might organizations involved in the communication of science diplomacy better leverage the possibilities afforded by social media platforms? How should interactive features be harnessed to stimulate debate both inside and outside of science diplomacy circles?

• What is the relationship between the broader media ecology and organizations involved in the production/promotion of science diplomacy? If science diplomats interpret social media using technoromantic and technodeterministic frameworks, could that hinder their effective interactions with the media ecology?

• Social media platforms may be seen as tools for bypassing mainstream media in order to reach a broader public (disintermediation), or as tools for reaching mainstream media for further amplification. In which cases would diplomats, scientists or both prefer disintermediation? In which cases would they prefer amplification of their activities?

Endnotes

• A fuller version of this InsSciDE work will be forthcoming in a peer-reviewed journal. Christensen M (in preparation) Media Ecologies and Science Diplomacy: Arctic Council's Communication of Science and Research Cooperation on Social Media.

• Cover image: @ArcticCouncil tweet, 22 February 2022.

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Indigenous Influence as Science Diplomacy:

The Case of the Arctic Council and Its Scientific Assessments

An InsSciDE Case Study

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The Arctic is home to a great number of Indigenous peoples who are directly and indirectly affected by changes that they themselves have not caused. It has become increasingly important to include Indigenous peoples and their knowledge in the governance of the Arctic. This case is concerned with the Arctic Council, an organization where Indigenous knowledge is included through "science diplomacy" in the terminology of the Royal Society and American Association for the Advancement of Science. The science diplomacy is performed on three different levels: in the Arctic Council itself and its structure which integrates both Arctic Member States and the Indigenous Permanent Participants as diplomacy for science; in the policy recommendations negotiated on the basis of scientific assessments as science in diplomacy; and in the increased inclusion of Indigenous knowledge in the assessments as science for diplomacy.

Image credit: Harald Finkler, Arctic Council

Keywords:

Arctic, scientific assessments, Indigenous knowledge, science diplomacy

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Indigenous Influence as Science Diplomacy:
The Case of the Arctic Council and Its Scientific Assessments

After the end of the Cold War, the Arctic became a region of increased international interest, because of both its strategic geographic position and its resources. Simultaneously, growing knowledge of environmental degradation in the region was cause for concern and action. Pollution from other parts of the world ended up in the Arctic, with severe effects on the people, flora and animals that live there. The end of the Cold War made it possible to organize circumpolar collaboration to battle pollutants and protect the region. Finland took the first initiative to develop a shared strategy. Not only nation-states signed on to this. Indigenous peoples also demanded to be included in the governance of the new Arctic.

Indigenous Arctic peoples' presence in deliberation and decision making aligns with a post-colonial and post-Cold War world order. It was no longer possible for nation-states to totally overlook and overrule the rights of Indigenous peoples, as had previously often been the case. As the governance structure put in place also relied on environmental expertise and new knowledge about the region and its changing nature, the inclusion of Indigenous peoples, their practices and their ways of knowing took on importance.

Science diplomacy takes place on three levels in the workings of the Arctic Council, a "high-level intergovernmental forum" established in 1996. The first level is in the Council itself and its structure integrating both Arctic Member States and the Indigenous Permanent Participants. The second level concerns the recommendations that result from scientific assessments and where agreement is reached with "full consultation and involvement of the Permanent Participants". The third is the growing variety of ways in which Indigenous knowledge is included in the production of knowledge that can feed into the assessments. This case study will describe how these three levels came about and function, before considering issues of capacity for participation in the Arctic Council hybrid governance structure.

The Arctic: A place for imaginaries

The Arctic has for a long time been an exceptional arena for western imaginaries. Multiple stories about the distant, dark, and dangerous region have fed European cultural understanding of the far north. At the same time, it has been a region for resource extraction, with whaling representing the epitome of European arctic exploitation. Whaling was important not least for the resulting oil which was burned in lamps and brought light into European homes. The whaling industry involved a great number of nations and companies competing over the rich bounty. During the 19th century, the far north region also became a place for scientific and other kinds of exploration, producing numerous male heroes who, in line with the understanding of the time, could make claims of discovery. In the 20th century, resource extraction grew to include also fossil resources like coal, and eventually oil and gas. Now the Arctic is an integrated part of global extractivism linking industry, financial systems, and global security. During the Cold War, the Arctic became a place of military presence and observation, to a great degree because the shortest distance between the two superpowers was across the Arctic, adding to the imaginary of the region.

Not a pristine environment

The environmental movement of the 1960s and the 1970s in North America and Europe had generated new initiatives that attempted to monitor and assess global environmental pollution and degradation. To establish a baseline with which to compare the extent of industrial pollution, scientists sought a pristine and unaffected environment. The Arctic seemed suitable, far away from much industrial activity. However, it turned out that the environment and the Indigenous peoples of the Arctic were not less affected by pollution due to industrialized countries' activities. On the contrary, the levels of persistent organic pollutants and mercury turned out to be very high in certain Indigenous populations. This was in large part because the hazardous substances released elsewhere were distributed globally, tended to be carried to the Arctic and stay

there, and bioaccumulated in the food chain which meant that the traditional food of certain populations was in fact dangerously polluted. Inuit mothers were told not to breastfeed, and the use of traditional and sacred foods was suddenly identified as harmful. Such long-distance impacts of pollution were not only of central scientific interest but had catastrophic social and cultural consequences for the peoples of the Arctic. The background to the creation of first the 1991 Arctic Environmental Protection Strategy (AEPS), and then its outgrowth the Arctic Council in 1996, was a pressing need to attend to threats faced by the Arctic populations and their environment.

Indigenous peoples join states in Arctic Strategy and Council

When the Cold War ended, it became possible to collaborate in new ways in the Arctic. The Arctic Environmental Protection Strategy, following a Finnish initiative, was signed in 1991 by the Arctic states Canada, Denmark (including Greenland), Finland, Iceland, Norway, USSR, Sweden, and the United States. At the same time, Indigenous peoples from three organizations demanded to be part of AEPS: the Inuit Circumpolar Conference (later Inuit Circumpolar Council or ICC), the Saami Council, and the Association of Indigenous Minorities of the North, Siberia and the Far East of the Russian Federation (later Russian Association of Indigenous Peoples of the North or RAIPON). These three organizations duly became observers to the AEPS and took part in most of the discussions and deliberations.

Credit: Inuit Circumpolar Council

A few years later, in 1994, a specific Indigenous Peoples Secretariat was created in Copenhagen to enable coordination between the organizations and further their participation in the work of AEPS. While the formation of an intergovernmental organization aiming for transnational collaboration was not particularly innovative, inclusion of Indigenous organizations was perhaps less common and marked an acknowledgement of their interests.

Credit: Saami Council

Credit: Russian Association of Indigenous Peoples of the North

The Arctic Council, built in 1996 on AEPS foundations, was cast as a "high-level intergovernmental forum". Six Indigenous organizations would claim an active role in the Arctic Council alongside eight Member States. Here the ICC, the Saami Council and RAIPON were made Permanent Participants. This group was extended by the Aleut International Association in 1998 and the Arctic Athabaskan Council and the Gwich'in Council International in 2000.

Credit: Gwich'in Council International

The Arctic Council working groups

Central to the machinery of the Council are working groups, most of which had been created under the aegis of AEPS. It was arguably these organs that would enable science diplomacy to be performed in practice and to become influential.

The groups were originally the Arctic Monitoring and Assessment Program (AMAP), Protection of the Arctic Marine Environment (PAME), Emergency Prevention, Preparedness and Response (EPPR), and Conservation of Arctic Flora and Fauna (CAFF). There was also a task force for Sustainable Development and Utilization. The Arctic Contaminants Action Program (ACAP) was established in 2006. Among these, AMAP was the group that produced the first assessments and has remained highly active since. Its first reports allowed for a deeper understanding of the changes in the Arctic and underscored the necessity of further environmental monitoring.

Credit: Arctic Athabaskan Council

Credit: Aleut International Association

Assessments "with full consultation and involvement"

The central outputs from the working groups are reports and scientific assessments. The purpose of scientific assessments in general is to gather and evaluate scientific data on a region or subject which is put together in reports that also draw conclusions, often for policy makers. AMAP - the Arctic Monitoring and Assessment Programme – has both monitoring and assessment in its name. While monitoring is a scientific practice where surveillance and data gathering take place according to predefined schemes, an assessment is an evaluation of the meaning of the data, involving dimensions that belong to the domain of judgement. (Etymologically the word "assessment" comes from Latin and Roman judicial system where the assessor decided the size of the fine for a convicted crime or taxation of a property.) This meaning has lived on, so the expectation is that an assessment report is not just establishing the state of the art but also offers recommendations and points to further activities.

In the developing practices of AMAP and the other working groups, the work has eventually materialized as two distinct products: one is the scientific report, and the other is the summary for policymakers, also called policy recommendations or plain-language text. The scientific report is peer reviewed in the normal and established way, paying attention to the integrity of scientific knowledge and expertise. Here authorship is essential, and scientists stand by their conclusions. The summary for policymakers, in which the policy recommendations are to be found, are politically negotiated. These texts do not have an author but are instead the product of compromise among the Member States and the Permanent Participants. As the Arctic Council seeks consensus, negotiation is an arduous process and compromise can mean that some findings are not brought forward, that some words are exchanged for others, and that titles are adapted so that everyone can agree.

Indigenous knowledge

There is no consensus on what to call knowledge of the Indigenous peoples of the Arctic. The Ottawa Traditional Knowledge Principles, adopted by the six Permanent Participants in 2015, use the term traditional knowledge and define it as "a systematic way of thinking and knowing that is elaborated and applied to phenomena across biological, physical, cultural and linguistic systems". Moreover, it is "generated through cultural practices, lived experiences including extensive and multigenerational observations, lessons and skills".

The uptake of traditional knowledge is established in the workings of the Arctic Council; however, there is an ongoing discussion about the term. Despite the fact that development and change are underscored as intrinsic to this body of knowledge, the term "traditional" might convey a static character and even be contrasted with knowledge that is perceived as "modern". While that is a misconception, the use of "Indigenous" instead of "traditional" avoids that false dichotomy. Earlier on, the important traditional knowledge in the Arctic context was sometimes regarded as being primarily "ecological", resulting in the abbreviation TEK. However, to draw lines between nature and culture in that way, and to furthermore privilege knowledge that might rest primarily with male hunters (who ranged over a territory observing its ecology), does not necessarily correspond to the inclusive and holistic ways of knowing by Indigenous communities. While "Indigenous" knowledge therefore might be able to better capture and convey what is at hand, that term however would fail to include knowledge in the Arctic carried by local populations that might not be Indigenous. The discussion on terminology is ongoing.

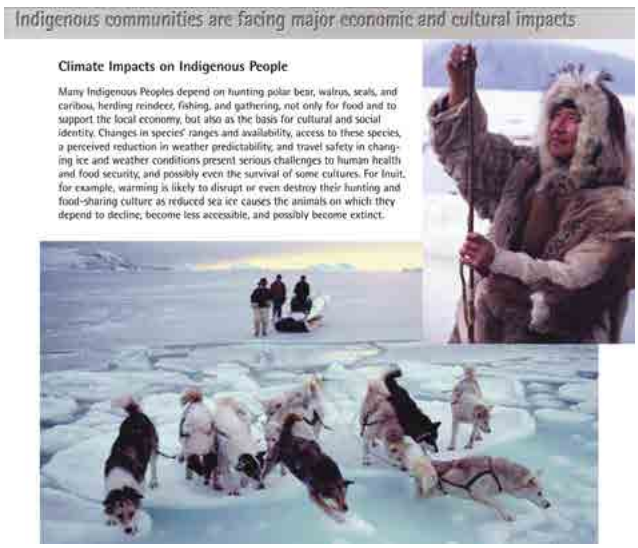
Processes of including Indigenous knowledge

To include Indigenous knowledge into the framework of western science is not a self-evident process. There are, moreover, multiple Indigenous peoples and their respective knowledge systems are not necessarily similar. An often articulated difference between Indigenous and western science knowledge is that the former is practical and aimed at livelihood and survival, whereas the latter is theoretical. Put differently, western scholars make careers and a living out of producing knowledge, whereas knowledge for Indigenous is necessary for living a good life. This also means that the context in which the knowledge production and circulation take place is very different in the two traditions.

Indigenous knowledge can be accessed by western science through methodologies of co-production, such as interviews, questionnaires, workshops, and immersive fieldwork. Gathering and documenting the practical knowledge of Indigenous peoples on, for example, frequencies within and among species, their movements, mating and feeding, have made the knowledge more accessible to others. These methodologies have been developed over time and promoted by scholars with long-term experience of working in the Arctic. However, they build on the premise of voluntary participation. Recently there has been a strong call for a decolonising of western knowledge production in Indigenous areas. This means including Indigenous participants before research projects are embarked upon as well as accepting the Indigenous right to say no to participate in projects. As indicated above, reasons for taking part in research projects vary between the traditions.

A further step in the inclusion of this knowledge into western science is to train Indigenous communities in scientific methods in order to increase control and agency among Indigenous. There are a multitude of projects that focus on this capacity building, although they are not evenly distributed in the circumpolar north.

In the production of assessment reports within the Arctic Council, the editors, lead authors, case-study authors, and contributing authors of different types of text increasingly seek peer reviewed Indigenous knowledge that can be included. Occasionally Indigenous knowledge is directly published through the reports, which in that way makes the knowledge available. In the peer review process of the reports, it is key to find reviewers able to assess the scholarship and conclusions, as with any other peer review.



"Indigenous communities are facing major economic and cultural impacts": screenshot from "Impacts of a warming Arctic - Highlights" 2004. Source and credit: Arctic Council AMAP, www.amap.no/documents/doc/impacts-of-a-warming-arctic-highlights/792

A few arenas of inclusion

Even though AMAP made early efforts to include Indigenous knowledge in its practice of assessment and evaluation, this was arguably not achieved until the Arctic Climate Impact Assessment, published in 2005 (an accessible "overview" dated 2004 also is available). In the report, climate change was the focus, reflecting the perceived need also to have regional assessments of climate change and impact. This followed the growing understanding that climate change was indeed a severe threat to the planet, but even more so for the polar regions. In the north this fact is called "Arctic amplification". At the time of the introduction of that term it indicated that the temperature change experienced in the Arctic could be twice as great as in the temperate zones of the globe; recent research indicates that this warming is in fact three to four times the global average. The Arctic Climate Impact Assessment (ACIA, 2005) is regarded as having produced an impact not only among already interested parties, but also beyond the Arctic Circle. Indigenous peoples and knowledge were not made the central topic of the report, but after an introduction and a portrait of the Arctic climate past and present, Chapter 3 was devoted to Indigenous perspectives. Both the placement of the chapter and the content signaled the engagement with Indigenous knowledge and interests. The inclusion of Indigenous knowledge varied greatly among other chapters of the report, with the chapter dealing with terrestrial ecosystems standing out for its effort to gather pertinent Indigenous knowledge.

Data gathering and assessment activities during the International Polar Year (IPY) of 2007/8 were also important for deepening understanding of what was sometimes called "the human dimension" of Arctic knowledge production. Natural science has for long relied on machinery to measure items and processes and establish facts. During and after the IPY, there was increased focus on social science and the humanities for studying the Arctic, also furthering methods by which different types of knowledge could be included. Scholarship from the IPY highlighted and brought to the fore the necessity of not just having the natural sciences define the region, but also to expand the types and number of disciplines that can contribute to the understanding of the Arctic.

The Arctic Resilience Assessment that resulted in the Arctic Resilience Report 2016 addressed Arctic peoples' responses in the face of rapid change brought about by climate change. Here the scientific framework was a socio-ecological systems approach that explicitly aimed to integrate environmental and social changes. In the report, the essential importance of traditional knowledge to resilience was underscored from the

start. For example, viewing resilience as holistic and integrated, rather than separate, arguably has commonalities with how Indigenous knowledge often view matters as interconnected and where ecosystems and people co-evolve.

A large part of the report was focused on Arctic communities and built on numerous case studies. The studies investigated Arctic communities with the aim of determining resilience. Among the cases were those that showed how fishing had shifted from one species to another or moved in time, exemplifying resilience; others that showed transformation of societies through new activities such as art or tourism; and examples of societies that showed loss of resilience, for example seal hunting brought to a halt because of animal rights movements, or reindeer herding challenged by both state restrictions and technological change. These cases reflected a strong influence of Indigenous knowledge, being co-produced by Indigenous peoples and scientists or relying on peer-reviewed publications using interviews and other methods to learn from the local populations.

Three types of science diplomacy in the Arctic Council

Indigenous peoples are part of the workings of the Arctic Council on all levels. The first one is enabled by the structure of the Arctic Council. There are eight Arctic states and six Permanent Participants, and even though the Arctic Council is an intergovernmental body, the Permanent Participants have from the start been part of the essential work over which the Council presides. This is manifested in the numerous declarations and statements that come out of the Arctic Council and where the Permanent Participants and the people and interests they represent are included and cannot be ignored. The **inclusion of Indigenous peoples at this "high-level intergovernmental forum" can be regarded as diplomacy for science**, in the terminology of the Royal Society/AAAS (2010). This means that including both states and Indigenous organizations can facilitate scientific cooperation in and about the Arctic. Indeed, the Arctic Council is not all about science, but a large part of the work carried out is scientific.

In the framework of the scientific and other assessments that come out of the working group structure, the **inclusion of Indigenous in the production of the assessment reports and the negotiations of the summaries are both examples of science in diplomacy** in the Royal Society/AAAS terminology, meaning that the inclusion informs and aids policy objectives of the Arctic Council and the Arctic states.

It is not possible for an assessment to exclude the Indigenous in the process of producing the report. When the summary for policymakers is written, Permanent Participants also decide what policy conclusions to draw and what words to use. This is mostly contrary to the situations of these peoples in the states they might live in. These processes are political, and interests are negotiated to find formulations around which consensus can be built. Based on scientific findings, a diplomatic exchange on what to try and achieve is carried out.

The knowledge production itself is an example of science for diplomacy, in the terminology of the Royal Society/AAAS. For a long time, western science in the Arctic relied on local expertise and support, but mostly failed to acknowledge the contribution. As of the late 20th and early 21st century, this is no longer possible in an international arena such as the Arctic Council. To exclude Indigenous knowledge from the scientific cooperation that is key to the present working of the Arctic Council would harm the international relations. Thus, inclusion is necessary for the relations within the Arctic Council and has become important to the legitimacy of the Council.

That the Arctic Council openly testifies to the importance of including Indigenous peoples and knowledge does not mean that the science diplomacy is without challenges. There is also a material side to science diplomacy. It is in general regarded to be impossible to exclude Indigenous peoples, but that does not mean that they have the same possibilities or facilities for inclusion. Formal structures might play out differently in practice. The most problematic issue in this context is the challenge of capacity among the Indigenous peoples and their representatives. This is true in all three types of science diplomacy.

The Permanent Participant organizations represent in each case a population base on the order of a few hundred thousand people (some are smaller, some larger). The Arctic Council Member States count hundreds of millions of people, albeit extremely unevenly distributed across the members and with only a minor portion living in the Arctic. The economic and administrative power that the US government has in relation to the Saami Council, for example, is not comparable. Furthermore, most of the representatives to the Permanent Participants do their work part-time, mainly supported by other undertakings, whereas Senior Arctic Officials and other civil servants to the Arctic Council are employed full-time by their respective governments. Similarly, participation in the working groups and the peer-review processes takes a high toll on those few Indigenous participants who can fulfil the demanding tasks. Finally, as indicated above, the knowledge production in itself is taking place under different circumstances than those of the Big Science of centrally funded knowledge economies including

"Comparison of Arctic sea ice concentrations between 1979 and 2003. 1979 marks the first year that data of this kind became available in any meaningful form. 2003 [at the time was] the second lowest concentration of sea ice on record." Archival data. Source: https://www.nasa.gov/centers/goddard/news/topstry/2003/1023esuice.html

many of the national members of the Arctic Council who draw on professional and employed scientists. Sometimes the very same people need to staff all levels, demanding skills in language and protocol of the varying processes.

That resources are unevenly distributed in collaborative efforts is more common than not. However, to really appreciate the costs of science diplomacy in the Arctic Council to the Permanent Participants, it is crucial to also realize this unequal capacity. Not only are the Indigenous poorly staffed in relation to Member States, but there are also great differences between the six Permanent Participants. An important step towards further inclusion would be to increase the capacity of Indigenous peoples' representation. This is true when it comes to both financial and human resources.

The Arctic Council is one arena where Indigenous interests can be argued and where Indigenous knowledge is important. However, this does not mean that Indigenous peoples do not face silencing and abuse in relation to the states where they are living. In fact, the rights of Indigenous vary substantially in the circumpolar north. In Canada there are several treaties that protect the rights of Indigenous. However, at the same time there are judicial rulings to the benefit of the Indigenous that might not be implemented in Canadian law. In Russia, Indigenous have very few rights and co-production is hardly if ever applied. In Sweden the state can and has recently decided on a new mining project in conflict with the wishes of the Saami village in the area. In Norway the state is empowered to limit the size of the herds of reindeer herders, to give a few examples.

In addition, the atrocities that Indigenous peoples have met with historically from representatives of the states they live in have only recently and partially been acknowledged. Again, the situation varies around the circumpolar north and information about the abuse will likely increase over time. The manner in which Inuit children were removed from their family, culture and religion through mandatory attendance at Canadian state boarding schools, or how Saami children were deprived of their language, form but a few examples.

The Arctic Council Impact Assessment report contains a map indicating the widely diverse localization of member communities of the six Permanent Participants. Modified screenshot for indicative purposes. Source and credit: ACIA (2004) p7, www.amap.no/documents/download/1058/inline

Conclusions

The Arctic Council is an organization which can be termed a science diplomacy actor since science diplomacy with varying objectives is carried out in different activities of the organization. Indigenous knowledge is included and welcomed on all levels and in all activities and has become indispensable in the science diplomacy of the Arctic Council. However, there are challenges to inclusion, and these need to be acknowledged on both a theoretical and a practical level. Furthermore, the implementation of science diplomacy results on the national level does not follow automatically.

Study Questions

• Are there any problems with putting alternative ways of knowing, such as Indigenous Arctic knowledge and observation, into the same category as western scientific knowledge?

• What issues arise regarding knowledge production, visibility and uniqueness?

• In governance contexts marked by great inequality in resources, how can science diplomacy address the challenge of capacity?

• What would be the point of such science diplomatic action if Indigenous rights are not recognized in the national context?

Endnote

• Cover image: "The last Ministerial under the Arctic Environment Protection Strategy in Alta, Norway, in 1997". Photo: Harald Finkler. Source: www.arctic-council.org/about/timeline/25/

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Traditional Knowledge in the Global Climate Change Regime:

Narratives for an Alternative Science Diplomacy

An InsSciDE Case Study

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Based on ethnographic observations during the 21st Conference of the Parties (COP 21) in Paris in 2015, this case study focuses on the narratives mobilized around the articulation between Indigenous traditional knowledge and the fight against climate change. It distinguishes the consolidation of three major narratives that frame this new participation of Indigenous peoples in this global arena: the victim-hero narrative around the theme of resilience, the narrative of integrating traditional and scientific knowledge, and the supernatural ecology narrative that refers to diplomatic-type relations with spiritual entities. Altogether, these narratives construct traditional knowledge diplomacy as an alternative to the official scientific diplomacy of climate change. They are part of an Indigenous diplomacy whose main objective remains the recognition of Indigenous rights and territories inside nation-states.

Image credit: J. Foyer & D. Dumoulin Kervran

Keywords:

Indigenous peoples, traditional knowledge, climate change, narratives

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Traditional Knowledge in the Global Climate Change Regime:

Narratives for an Alternative Science Diplomacy

The Intergovernmental Panel on Climate Change (IPCC) is one of today's best examples of a science diplomacy "institution"; nonetheless, other forms of diplomacy based on other forms of knowledge are gaining voice in the climate arena. Indeed, Indigenous peoples and their allies are advocating for alternative ways of fighting against climate change through the mobilization of traditional knowledge. At the 26th Conference of the Parties (COP) held in Glasgow in November 2021, a set of European and North American governments led the $1.7bn funding pledge aiming to reverse global forest loss and land degradation by 2030; campaigners were cautiously hopeful that an equally significant outcome of COP26 could be the real defense of Indigenous peoples' rights. This case looks backward to COP21, whose landmark Paris Agreement recognized these rights, and examines the narratives expressed there – which, as instruments of political action and diplomacy, continue to frame these peoples' participation in global climate negotiations.

In 2015, the Paris Agreement forged at COP21 created a new frame for international diplomacy about climate change. Its preamble recognized the rights of Indigenous peoples. In section 5 of Article 7, it also established that adaptation policies should "take into account and be informed by the best available science and, as appropriate, traditional knowledge, knowledge of Indigenous peoples and local knowledge systems" (United Nations 2015).

Getting these affirmations into the Paris Agreement was the subject of diplomacy by Indigenous organizations, supported by various scientific communities, international institutions, and pro-Indigenous states, and commencing long before COP21. The construction of narratives (understood here as discourses that mix objective, emotional and argumentative dimensions) constitutes a fundamental step in this political action. Our case study examines the consolidation of narratives that articulate the theme of climate change with that of traditional knowledge and, more generally, of Indigenous peoples. Such narratives' first political effect is to give Indigenous peoples a place in the production of future scenarios for humanity; the second is to establish support for the defense of their interests via access to symbolic and material resources. As such, narratives can be considered instruments of diplomacy. The narratives we shall analyze were heard and read during our immersive observation of COP21. They treat traditional knowledge as a central element of Indigenous climate change diplomacy. Diplomacy formulated around this traditional knowledge presents an alternative to the "classical" science diplomacy of the IPCC. Indeed, it opens up in the UN arenas the possibility of other forms of diplomacy, beyond states and even "beyond humans", but also of other forms of knowledge, beyond the canons of a globalizing western science. This diplomacy of traditional knowledge operates at various levels: first among Indigenous peoples, then with other stakeholders in international negotiations, and, at a more fundamental level, with a whole series of non-human entities.

From the state-level negotiations during COP 21 to more alternative spaces like the Climate Action Zone welcoming global civil society, we found Indigenous narratives to be carried through a wide range of channels, reaching a wide variety of actors, from heads of state to passersby in the Paris metro. While not obviously central, the Indigenous presence at COP 21 was significant and visible, with many of the participating organizations clearly identifying this COP as an important event at which to continue to push their agenda, advocate for their cause, establish contacts and capture resources and projects from international funders.

Visit of French president François Hollande to the Indigenous Pavilion during COP21. Photo: J. Foyer

Protagonists:

Who gives a voice to traditional knowledge?

Indigenous peoples' organizations - In the global climate arena, the voicing of traditional knowledge has depended crucially on the emergence of a strong "Indigenous peoples" actor. Despite the heterogeneity of Indigenous realities, the last 40 years have seen the emergence of representatives or organizations legitimized to take the stage and speak for all Indigenous peoples. The main thrust of Indigenous peoples' global movement has always been the claim to specific collective and territorial rights, as defined and promoted in the UN Declaration on the Rights of Indigenous Peoples adopted in 2007.

Anthropologists and scientists from related disciplines - Field scientists of western tradition have also played an important role as spokespersons for traditional knowledge in the climate change arena. They are key players, acting as an "epistemic community" that defends the value and legitimacy of traditional knowledge as a tool to fight against climate change. Some of them are especially active in institutions such as the IPCC and UNESCO.

States and international organizations - Several northern European states, Peru, Mexico, and the Philippines have supported Indigenous peoples with financial and political resources and by relaying their demands in climate negotiations. International organizations such as the United Nations Environment Programme (UNEP) or Development Programme (UNDP) or the European Union are also supportive.

International NGOs - The primary international non-governmental organizations (NGOs) supporting Indigenous voices are specialized in Indigenous rights (International Work Group for Indigenous Affairs IWGIA; Survival), or land tenure for Indigenous peoples (Tenure Facility). Environmental NGOs such as the International Union for Conservation of Nature (IUCN), Conservation International, or various rainforest foundations are also strategic allies for Indigenous peoples

Political, diplomatic and environmental stakes: Identities, territories, and environment

Recognition of traditional knowledge is the cognitive dimension of a broader process of recognition of Indigenous peoples at national and international political levels. The most important diplomatic process on this topic led to the 2007 United Nations Declaration on the Rights of Indigenous Peoples.

The main diplomatic and political stakes of the Declaration are the recognition of multicultural identities in nations where Indigenous people are often marginalized or even denied. The recognition of Indigenous peoples supposes a high standard of protection of their basic human rights and specific freedoms, signifies the possibility of local governance based on tradition and customs and, above all, guarantees sovereignty over their land, territories, and local resources.

Such territorial authority is tightly linked with the question of environmental governance. For this reason, Indigenous people commonly take specific diplomatic action in arenas such as the United Nations Convention on Biological Diversity or Framework Convention on Climate Change. Indeed, the territories in which Indigenous peoples carry out their lives (such as tropical forests, mountains, islands) are often well conserved through the active protection by these resident populations. Traditional knowledge refers to their specific experience of the places where they have held this stewardship role since time immemorial.

Navigating the territory and learning to use Geographical Information System (GIS) during a 2022 workshop between Panamanian and Honduran Indigenous people: an example of combining traditional and scientific territorial knowledge. Photos: Yann Voisin

Technoscience: The dialogue of knowledge

A first scientific dimension of this case is the role of certain disciplines such as anthropology or ethnosciences (ethnobotany, ethnoecology, etc.) in studying and reporting Indigenous peoples' specific relations to and management strategies for their environment. A typical example can be found in the interest accorded by western scientists to the knowledge of Inuit People regarding ice and climate. On the basis of studies and co-construction of this Arctic knowledge, scientists built what can be called an "epistemic advocacy", i.e. a scientific knowledge-based discourse that aims at influencing politics, in this case climate change mitigation and adaptation policies.

A second scientific dimension of this case is more "epistemological" than strictly empirical. It has to do with the possibility of recognizing other ways of knowing the world. Traditional knowledge emphasizes ecologies and experiences of climate change based on sensory, spiritual or other relationships with the environment more than on scientific measures and models.

A third technoscientific dimension deals with the possibility of establishing a dialogue about knowledge, to take place between traditional knowledge and science. One example concerning the environment and promoted at the international level is community mapping. It is a way to both secure Indigenous territory and monitor the global environment (for example by comparing the "baseline" state of frequently better conserved Indigenous spaces with the state of those occupied or affected by other populations). With the rise and democratization of mapping technologies (drones, GPS, GIS, etc.) this kind of surveying activity implies a mix of hi-tech science and traditional knowledge of the territory, creating new hybrid epistemologies.

> Epistemology: the study of the nature, origin, and limits of human knowledge.
> *-Encyclopaedia Britannica*

Placing wordings and narratives

International texts on environmental governance are drafted in a negotiation process where each of the parties tries to insert, as often as possible and in the most appropriate places of the text, their "wordings" which condense their claim into a few words. Such wordings are forms of purification of discourse. By contrast, "narratives" can be considered to be more developed versions, claims fleshed out and conveyed in stories, an assembly of facts, imagery and anecdotes. They represent very important modalities of argumentation within a diplomatic negotiation. Here we examine the consolidation of three such narratives that articulate the theme of climate change with that of traditional knowledge and, more generally, Indigenous peoples. These narratives portray these peoples as key players in the development of scenarios anticipating the future of humanity, at the same time justifying their interests and supporting the defense of their claims. As such, narratives are key diplomatic instruments in the climate arena.

Indigenous delegates at Indigenous Peoples' Pavilion of the COP21 Generation Climate space, 4 December 2015. Photo: J. Foyer & D. Dumoulin Kervran

The resilience narrative: When victims become heroes

The resilience narrative is powerful, with both symbolic and political dimensions produced not only by media, but also by Indigenous actors themselves. In this narrative, denouncing the impact of climate change and proposing a set of solutions, traditional knowledge plays a central role.

In this narrative Indigenous peoples are positioned as the most direct witnesses of climate change; the narrative explains how, due to their geographical distribution, these peoples are the first to suffer from its impact. Melting of the Arctic ice floes for the Inuit, melting of glaciers for Indigenous peoples from the Himalaya or The Andes, problems of drought, access to water and loss of agricultural land for the Maya in Guatemala, desertification for Peul pastoralists in Chad: these are but a few of the striking examples shared to demonstrate how Indigenous peoples form the front line for climate change effects, even though they scarcely contributed to the phenomenon. Therefore, they are in a privileged position to alert the rest of the world to this situation. Rooting in an intimate and concrete experience of climate change impacts, the alert raised by Indigenous knowledge is complementary to the more distanced, scientific and theory-based alert raised by the IPCC. This story, therefore, combines the figure of the victim with that of the witness and the whistleblower.

This discourse about a situation of vulnerability, considered as unjust, offers to Indigenous peoples the opportunity to play on the theme of climate justice. However, during COP21, references to climate injustice remained marginal in the general framing of the problem and in speeches. Indeed, Indigenous peoples preferred to present themselves as active providers of solutions rather than as passive subjects merely experiencing climate change. In this perspective, traditional knowledge is presented as precisely the element enabling resilience, i.e., the passage from the status of victim to that of a true hero of climate change.

Facing climate change, Indigenous peoples draw on their deep ancestral knowledge of their territories, knowledge uniquely suited to understanding and action in the delicate balance of nature. In this powerful narrative, Indigenous peoples can in this way make an important contribution to global efforts of climate change adaptation and mitigation, both directly and by teaching others.

A very good example of this narrative was expressed in the conference "Resilience in a time of uncertainty: Indigenous Peoples and Climate Change" just before the opening of COP21, co-organized by UNESCO and the National Museum of Natural History of France in partnership with Tebtebba (one of the principal Indigenous organizations in Asia) and various national and international institutions. The text that presented the event offers a perfect summary of this narrative:

> "For over 350 million Indigenous peoples, climate change impacts are expected to be early and severe due to their location in high-risk environments. To face these challenges, Indigenous peoples are mobilizing their in-depth knowledge of the territories which have been the source of their livelihoods for generations. This Indigenous knowledge operates at a much finer spatial and temporal scale than that of science, and includes understandings of how to cope with and adapt to environmental variability and trends. Indigenous knowledge can thus make an important contribution towards climate change action on adaptation and mitigation (...) and in recent years this has been formally recognized by IPCC and the United Nations Framework Convention on Climate Change."

The integration narrative: Dialogue of knowledge and innovations

Another important narrative that was heard throughout the two weeks of COP21 aims to present traditional knowledge as not opposed but rather complementary to western scientific knowledge in the effort to adapt to climate change. This narrative blurs the distinction between traditional knowledge and scientific knowledge in order to implement new forms of environmental co-management. Various projects based on collaboration between Indigenous peoples and scientists were presented in conformity with this narrative.

According to this perspective, Indigenous knowledge is more than simply traditional and local; it can bring new data and perspectives to modern science and contribute to innovation. This narrative of possible innovation, at the intersection of traditional and scientific knowledge, radically transforms the classical perspective on traditional knowledge as a relatively stable set of cognitive elements. It allows the actors who carry it to align themselves with the dominant narrative of science as a vector of innovation for resource management, in the more general framework of the knowledge economy.

To give an example of this integration narrative, an oft-discussed issue has been "Indigenous REDD+" (see endnotes), and more specifically one of its pillars, "Indigenous MRV" which entails Monitoring, Reporting, and Verification. This reappropriation by Indigenous peoples of the official UN-REDD MRV mechanism leverages local and real-time monitoring of climate change by Indigenous peoples themselves. It combines one of the most traditional activities of forest Indigenous peoples — control over their territory — with high-tech tools such as cellular phones, GPS, satellite images, and drones. As Henderson Rengifo, president of the Peruvian Amazonian Indigenous organization AIDESEP noted,

> "With time, the climate jargon is always stronger. Nevertheless, the so-called Indigenous Monitoring, Reporting, and Verifying for us is nothing but a form of governance and vigilance of our territory, that is to say what we have always been doing all along our history, but this time with technological tools that enable us to do it better".

Training in drone management by Panamanian organization Geoindigena in Honduras, 2022. Photo: Yann Voisin

The supernatural ecology narrative

A third narrative we could identify includes a relationship to spirits and the supernatural. In this narrative, traditional knowledge must no longer be considered only in its practical and cognitive dimensions, but also in its ontological dimensions in the sense that it implies other ways of living and composing the world. In other words, traditional knowledge embraces other worldviews or another cosmovision. The claim to other ecologies becomes in this narrative a powerful tool for contesting hegemony. Compared to the narrative of integration, then, the narrative of supernatural ecology tends to re-establish differences and ruptures with western ways of knowing and seeing the world.

The demand for a different way of composing the world and conceiving nature was an important component of the discourse of some Indigenous organizations and their allies during COP21. This was all the more evident when it came to evoking shamanism and an ecology that goes beyond the material and natural worlds to incorporate other entities, particularly of a spiritual nature. It is precisely the consideration of the spiritual dimension and the ability to make westerners accept this dimension that constitutes the basis of supernatural ecology.

Invited by the Ile de France host region for various events during COP21, representatives of the Quichua People from Sarayacu (Ecuadorian Amazonia) were very active in disseminating a supernatural ecology narrative with their Living Rainforest ("Selva Viviente") initiative. Felix Santi, President of the community of Sarayacu, stated firmly:

> "We came from the remote land of Ecuador, upset by the situation of Indigenous people, connected with the guardians of the forest, with a connection to the cosmic world. Climate change affects all the living beings that live on this little planet, the Earth. Sarayaku elaborated its living plan and its proposal: Living Rainforest (Selva Viviente), Kawsak Sacha. Sarayacu's proposal is a space where we apply ancestral knowledge. Our Yachak, our wise men, interact with the beings who protect the water, the mountains, and the forest (...). The main objective is to reach a clear recognition by the Ecuadorian state of this space as a sacred biocultural heritage, free from oil exploitation. Our call to the international community is to become aware of the necessity to maintain the Kawsak Sacha, the living rainforest" (*Felix Santi*, 1/12/2015, translation by the authors).

> Ontology, or metaphysics:
> the philosophical study of 'being' in general.
> *-Encyclopaedia Britannica*

Presentation of the "Selva Viviente" (Living Rainforest) initiative by Sarayaku People Delegates in the COP21 Climate Generation space, 1 December 2015. Photo: J. Foyer

PARIS2015
LA RECHERCHE
SE MOBILISE
POUR LE CLIMAT

Image credit: COP21

Conclusions: Alternative diplomacy, other knowledge

We can consider diplomacy engaging traditional knowledge as an alternative diplomacy in its form, enlarging the sets of institutions and representatives among whom interactions take place. Moreover, traditional knowledge diplomacy points to an alternative science diplomacy of the climate in its legitimation of other forms of knowledge.

Indeed, unlike the classical model of diplomacy, traditional knowledge diplomacy is primarily the prerogative not of sovereign states but of Indigenous peoples. While these peoples defend their cultural and territorial sovereignty based on the principles of self-determination, treaty, or prior and informed consent, they do not claim the political form of classically organized diplomacy. Like the diplomacy practiced by environmental NGOs or transnational firms, the practice by Indigenous peoples as observed at COP21 opens up the notion of diplomacy taking place beyond nation-states or rather, in their interstices. While the practice of traditional knowledge diplomacy in the climate change regime may be largely subject to the codes of classical western diplomacy, it also diverts these codes by introducing other ways of speaking, of presenting oneself, other less technocratic and more embodied formats of discussions, as well as other forms of sanctity and rituality.

Traditional knowledge diplomacy is an alternative to scientific diplomacy also because it contrasts with the diplomacy of "Big Science", which dominates the IPCC in particular. The work of this enormous scientific-diplomatic machine is indeed dominated by the prevalence of global models, whether they be climatic or economic. This reign of abstraction and globalism, where "global average temperature" and "ton of carbon" are unsurpassable metrics, has been criticized for its tendency to flatten the world and erase differences in experience, knowledge, value, or even meaning of climate change. The decoupling of climate science from the direct experience of climate change tends also to render invisible the temporality and territoriality of the problem, making its translation into public policy more difficult. Finally, the hegemony of a globalizing and abstract knowledge is linked to a political order that produces inequality. In this context, traditional knowledge holds up an inverted mirror to global and top-down Big Science, and to the governance that typically accompanies it. While perhaps not perfectly symmetric, traditional knowledge as it is presented and narrated in the climate arena opposes localism to globalism, particularism to universalism, a situated and embodied presence to the "view from nowhere" (Shapin 1998), tangible and affective experience to cold abstraction, marginality to hegemony, tradition to modernity, and even spirituality to materiality.

The diplomacy of traditional knowledge thus seems to lay the foundations of an alternative to the science diplomacy of climate change. It exercises a kind of influence or form of soft power where the challenge is not so much to impose decisions and norms as it is to change representations, roles in the climate arena, and alliances. This influence must be understood cumulatively and over the long term. The exercise of traditional knowledge diplomacy does not drastically change the living conditions of local communities, and it may even in some cases create or reinforce a conceptual gap between global humanity and local autochthony. However, its contribution over the last 50 years to a growing institutional and political consideration of Indigenous peoples and their rights must be acknowledged.

Meeting of the Indigenous Peoples' Caucus at COP 21 in Paris. Image credit: Foro Indígena de Abya Yala © FIAY 2015.

Study Questions

• What exactly can be considered as traditional knowledge of climate change? Where is it encountered? Is it familiar or strange to readers of this case?

• In what ways is this knowledge different from modern or western scientific knowledge?

• On what grounds would you consider traditional knowledge diplomacy to be a vital element of the climate change regime today? On what grounds would you argue to exclude it?

• Can we consider Indigenous peoples to be stewards of the environment? Could that give them a particular status in climate policy negotiations?

• Based on examples from this case, how does the Indigenous exercise of knowledge diplomacy work concretely? Can other forms of its influence be found or suggested?

Endnotes

• A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See Foyer J, Dumoulin Kervran D (2020) Mettre en récit les savoirs traditionnels : Une diplomatie scientifique alternative à la COP21. Homo diplomaticus 73. journals.openedition.org/terrain/20607. Accessed 5 May 2022

• As discussed in the "integration narrative", REDD stands for "reducing emissions from deforestation and forest degradation"; this United Nations approach is complemented by REDD+ adding "the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries".

• Cover image: A representative of the Embera people Indigenous to Panama converses in the COP21 Green Zone with members of civil society, Paris 2015. Photo: J. Foyer & D. Dumoulin Kervran

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Selected Publication

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Science Diplomacy and Ocean Exploitation:

The Power of Sociotechnical Imaginaries to Shape the Future

An InsSciDE Case Study

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Promoters of ocean exploitation in the late 1960s envisaged wonders such as rare mineral extraction and the stationing of divers in underwater habitats from which they would operate seabed machinery undisturbed by turbulent surface waters.

These scientific and sociotechnical imaginaries caused uncertainty in the international community, especially in the global south, that led the United Nations to call Law of the Sea conferences to mediate emerging geopolitical tensions caused by the potential exploitation of ocean spaces. These conferences became a site where lawmakers projected futures rather than merely responding to past or present dilemmas.

Diplomats' negotiations, with their basis in anticipation of the future uses of science and technology, reveal the role of sociotechnical imaginaries within complex science diplomacy negotiations.

Image credit: Klaus Bürgle

Keywords:

Law of the Sea, sociotechnical imaginaries, resource security, ocean science

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Science Diplomacy and Ocean Exploitation:
The Power of Sociotechnical Imaginaries to Shape the Future

Science diplomacy is not bound simply to the present; it is concerned also with future projections and influenced by past transgressions. When diplomats consider the potential of future developments in science and technology, their decision making often is based on entirely imagined scenarios and technologies. Forecasts are often at the center of international tensions and divisions. This case study demonstrates that sociotechnical imaginaries - as defined by Sheila Jasanoff - historically have impacted science diplomacy.

Understanding science diplomacy requires careful weighing-up of potential futures within existing sociotechnical imaginaries and their possible impacts on the international diplomatic system. The seabed politics at the United Nations in the late 1960s and 1970s can be analyzed through this lens, paying particular attention to how imaginaries affected the making of international diplomacy and law, and considering their role in intensifying the global north-south conflict that came to dominate United Nations (UN) diplomatic efforts in the 1970s. This discord was driven by the claimed potentialities of an emerging science and technology of the oceans that far outweighed the actual capabilities of the time.

This case study interrogates three areas of diplomatic tension provoked by ocean sociotechnical imaginaries: the ocean as science (to expand knowledge), as resource (to be procured), and as environment (needing protection). These sites of tension emanated from within developed nations during meetings of the ad-hoc UN seabed committee (1967-72), and the subsequent UN Law of the Sea III conferences [UNCLOS III] (1973-1982).

Sociotechnical imaginaries and science diplomacy

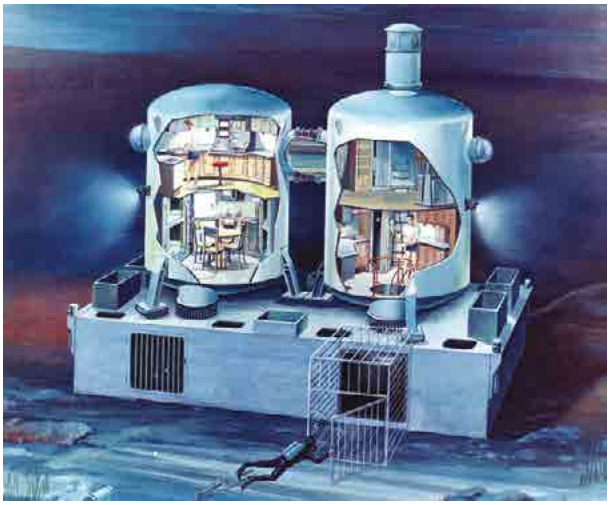
The connection between technoscientific futures and nation-states reveals the power that imaginary visions can have. From these visions emerge policies that in turn influence the evolution of technology, government grants, and the relationship between science, technology, and democracy through the inclusion or exclusion of citizens from these projects.

All visions of the future are fiction, and by extension using historical hindsight to study the "accuracy" of such predictions is analytically redundant. Sociotechnical imaginaries have agency in the moment of their creation and shape policy debates as objects that perform within their specific political-social-cultural contexts. Importantly, imaginaries are publicly visible and thus orchestrate change within social systems even when international relations remain unchanged. As opposed to tired dissections of the accuracy of imagined science futures, a more useful mode of analysis is to study the impact of sociotechnical imaginaries in the context of their creation. Sociologists of science Jasanoff and Kim (2009) suggest that sociotechnical imaginaries fabricate power within the political state that can far outweigh the actual abilities of science and technology at the time. It is in this blending of present capability and imagined attainable futures that a great deal of power is formed from human imagination.

Technologies do not emerge in isolation. There are always multiple technological options being introduced at the same time, but only some are ultimately "successful". A technology developed in one place is likely to spread quickly, or be used in or against another state, and the loci of technological development might move from an established national context to an emerging one. Sociotechnical imaginaries are nationally shaped, but if similar sociotechnical imaginaries exist in multiple countries that coalesce around a single scientific objective or technology, then they can be compared transnationally. Where there is discord between nations regarding the use of a technology, the resulting imaginaries – connected by science but divergent due to their ideological and national contexts – will inevitably become a site of conflict in the international arena.

The ocean as sociotechnical imaginary

Ocean-centered sociotechnical imaginaries were driven by broader re-imaginings of the ocean as a frontier in the mid-twentieth century. These imaginaries implied to the public, industry, politicians and military leaders that new scientific knowledge of, and emergent technological capabilities in, the global ocean held great potential. This new technologically-driven oceanic age had implications for national security, freedom of marine scientific research, new economic development, and protection of the marine environment.



Rendering of Tektite II, 1970. Source: https://stjohnhistorical-society.org/crystal-blue-view-of-tektite-ii. Public domain.

During the 1960s nuclear powered submarines carrying intercontinental nuclear ballistic missiles had entered the Cold War battlefield, ushering in a new mode of nuclear standoff: the secondary deterrent. By the end of the decade fears were rising that the next step would be to install permanent seabed nuclear weapons launch facilities. Emerging military capabilities were facilitated by the latest discoveries of marine scientific research, seemingly in the hands of only the powerful industrialized nations. Their formidable nuclear naval capabilities further stoked north-south conflict.

The power disparity became particularly clear with seabed mining, where the potential extraction of manganese nodules drove the perception of technological advance far beyond actual capability. During the 1960s the oceans emerged as a potential new technological frontier filled with abundant non-living resources.

Renewed interest in the oceans and knowledge of their potential simultaneously evolved as a serious diplomatic challenge for the United States, and ultimately, through debates at the United Nations, for the entire globe. Edward Wenk Jr, the ocean science advisor to the Kennedy, Johnson, and Nixon administrations, highlighted that "...in an unwitting scramble for riches, Pandora's Box was opened in terms of such questions as who owns the sea and seabed".

This scramble was predicated upon sociotechnical imaginaries of deep-sea marine resource exploitation that utilized anticipated, rather than actual, new technologies. These imaginaries of immense ocean riches – won from the deep with technology and the determination of ocean roughnecks – were powerful images for developing nations that were often newly independent of colonial rule and desperate to attract foreign currency through resource-based industries, but who had not hitherto been "sea-oriented". In an era when the superpowers sought rare minerals such as cobalt to use in the high technologies of the Cold War, caches of minerals took on geostrategic implications.

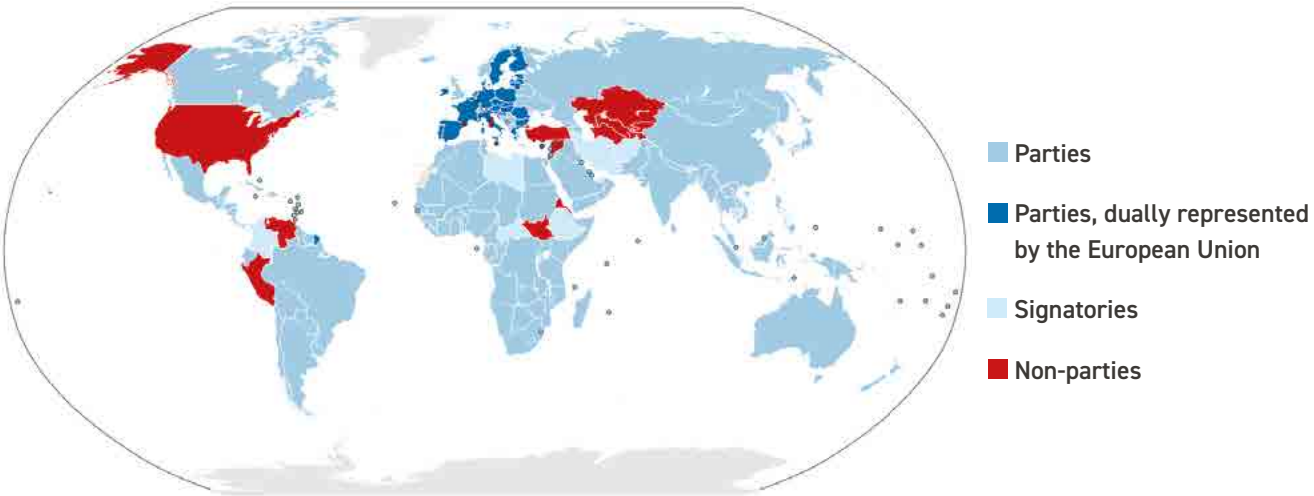
Sociotechnical imaginaries of the riches of the deep were a global phenomenon insofar as all nations began to see the ocean depths as containing an untapped treasure, but these imaginaries were each shaped by very specific national contexts.

Overall, the advanced technological nations perceived this future bounty positively, while the developing world feared a neocolonialism marked by resource wars and exclusion from this new "gold rush". Developing coastal nations were wary of technologically advanced nations entering their territorial waters to exploit marine resources, fearing how these global powers might wield their technological and economic superiority. This mistrust also came to encompass ocean scientists whose post-war scientific discoveries had initially spawned interest in the seabed. This placed science and technology at the heart of diplomatic deliberations concerning the future of the international Law of the Sea.

Protagonists: Ocean boosters

There were many actors involved in the sociotechnical imaginary of the ocean, including a host of non-human protagonists such as polymetallic nodules, offshore hydrocarbons, and various fisheries. However, it was the human actors who drove the notion of the ocean as a space for exploitation for the "common benefit of (hu)mankind". These were collectively known as ocean boosters. They lobbied domestically and internationally for access to the supposed riches of the ocean, and created consortia of like-minded individuals and business interests. Motivated by capitalistic desires for wealth, they showed little care for a fair and equitable ocean regime. Instead, they competed to be the first to extract ocean minerals, sensing that unprecedented financial reward awaited the victor.

Tektite I. The laboratory was built in 1969 and submerged 15m in the waters off the Virgin Islands. Source: https://exploration.marinersmuseum.org/watercraft/tektite. Public domain.



Map of parties to the United Nations Convention on the Law of the Sea (2015). Source: Wikimedia commons, public domain.

Ocean as science (to expand knowledge)

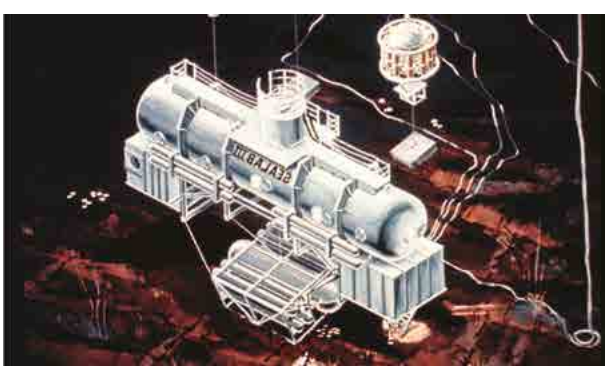
Where had new knowledge of the ocean come from? After the Second World War oceanographers of the major maritime powers saw their budgets expand, enlarging the scope of marine scientific research and in particular military oceanography. Despite increased resources it quickly became apparent that some of the really big questions of ocean science, such as understanding global ocean current circulation, required international coordination and cooperation. In the early Cold War, new international scientific conferences, committees, and expeditions gave opportunity for west to meet east. The aim of international scientific cooperation was to utilize science as a method for defusing international Cold War tension. However, this also gave national intelligence networks the opportunity to spy on other nations' scientific programs. Despite the many ulterior motives for promoting international oceanographic collaboration, by the early 1960s international collaboration was the norm.

As the number of nations actively participating in oceanographic research increased through the 1960s, maritime powers began to shift their science policy focus away from large general international expeditions. Instead, their attention was on more specialized, expensive and technologically intensive projects shared amongst a small group of countries and usually directly controlled by the United States. These specialized projects focused on deep-sea drilling, remote sensing of ocean currents and weather, and the beginnings of early satellite oceanography. These new projects were extremely large, vastly expensive, and open only to the richest nations with trained scientists in a position to collaborate.

The major powers continued national contributions to international scientific coordinating organizations – such as the UNESCO-coordinated Intergovernmental Oceanographic Commission (IOC) and the International Council of Scientific Unions, Scientific Committee on Oceanic Research (SCOR) – in order to uphold the pretense of oceanography as an internationalist and peaceful open science.

The more internationally inclusive of these two bodies was the IOC, established in 1960 in Paris with 40 founding members: 7 Central and Latin American, 5 African, and 6 Asian developing nations, 17 industrial nations, and 5 communist countries. Its stated aim was to "promote scientific investigation with a view to learning more about the nature and resources of the oceans through the concerted action of its members." However, the potential of research ships flying the flag of the United Nations was never realized, and the IOC remained a collection of national members pooling unequal resources.

In the view of the nations of the global south most marine scientific research was self-serving, paying only lip service to the needs of developing nations. This was a significant driver of discord. Over time the IOC became instrumental in shifting science diplomatic power from industrialized nations to the global south, frustrating oceanographers in the global north.



SEALAB III, last of the Navy's undersea habitats, circa 1969. (Reversed as in original.) Credit: OAR/National Undersea Research Program (NURP); U.S. Navy

This transfer of control is indicative of the major challenge faced by the science diplomacy of the late 1960s and throughout the 1970s.

During the 1960s, the wider international community no longer instinctively took science to be neutral. At the UN Law of the Sea conferences, science itself came "under heavy attack" and was interpreted by some as a weapon in a new age of ocean colonialism.

During the Law of the Sea negotiations, the delegations of the leading nations of the global south were wary and skeptical of claims made by the global northern maritime powers regarding the internationalism, peacefulness, and future benefits of marine science research. This suspicion was proven correct following several highly public revelations regarding the use of oceanography by the United States as a "cloak of secrecy".

In 1968 the USS Pueblo, a US Navy oceanographic vessel, was captured by North Korea with two civilian oceanographers aboard. The US claimed that the ship was conducting oceanographic research but it was found to be equipped with surveillance apparatus. In 1975, it was revealed that the sister-ship to the deep-sea drilling vessel the Glomar Challenger - the Glomar Explorer - had been secretly used by the CIA to raise a Soviet submarine in the Pacific. Mistrust grew with the entry of major aerospace engineering firms closely associated with the military-industrial complexes of several NATO countries.

Traditionally marine science had been the preserve of governments and militaries, but investment by multinational corporations showed that there was money to be made not only from armaments sales but from commercial uses of the oceans as well. This further highlighted the financial disparity between the leading industrial maritime powers and the rest of the world, whose industry lacked the capital to make such investments. The entangled nature of science and international trade and affairs led to questions concerning the true role and intention of expanded marine scientific research and further disrupted the notion of science as politically neutral.

Stark financial disparities were seen between the global north and global south in support for marine scientific research. In 1967, the ten most industrialized countries employed 7,392 marine scientists, operated 453 research vessels, and spent $570 million on marine scientific research. The corresponding statistics for Latin American, Africa (excluding South Africa) and Asia (excluding Japan) were 709 marine scientists, 47 research vessels, and a combined budget of less than $7.5 million. The distance between developed and less-developed nations seemed insurmountable without the input of the UN and the transfer of ocean technology.

Technologically mediated commons

Humans can explore the deep ocean only with technology. The sociotechnical imaginary of the ocean was made possible only because of scientific and technological advances in the mid-twentieth century. This is not to say that the technology drove the creation of the ocean imaginary. On the contrary, very human motivations of greed, resource security, and geopolitical control created a neocolonial ocean, predicated on owning the technological means to imagine that such remote spaces could be exploited.

Here science and technology enabled human decisions about what the post-colonial ocean regime should look like. In turn, ocean boosters built a neocolonial extractive ocean regime that is still with us.

Ocean as resource (to be procured)

Knowledge of the new economic potential of the ocean came from the rapid expansion of marine science in the developed world in the years after 1945. For ocean boosters, the seas offered far greater potential riches than remote outer space. The most prominent "newly" discovered ocean resource was manganese nodules. They captured the imagination because of the rare minerals they contained and the abundance with which they covered certain areas of the sea floor. Over the course of the 1960s these "little black marbles" attracted the attention of geologists, the mining industry, governments, international lawyers, and through numerous articles and documentaries the general public. A plethora of budding investors migrated to the ocean frontier.

"The ocean is like a grab bag stuffed with riches out of which man has been taking only those few packages he can lay hands on easily, often by blindly groping. ...One of the bright promises of oceanography is that an increase in scientific knowledge of the sea will help man systematically to exploit the resources of the marine grab bag"
(*Robert Cowen, popular science writer, 1960*)

Futurist art of Charles Schridde. Source: neverwas-mag.com/2021/10/the-art-of-charles-schridde. Public domain.

As the chief of mineral economics at the US Department of the Interior wrote in an article in 1968, however, "the distance from scientific phenomenon to world resource is indeed large." The dual challenge of extremely high start-up costs along with an uncertain market for sea-bed manganese was a problem not only for mining companies entering the sector but also for governments, and in particular for diplomats charged with devising an international regime for deep-sea mining.

Both US Steel in 1966 and the US Commission on Marine Science, Engineering and Resources in 1969 concluded that even under the most favorable technological assumptions, the return on investment in deep-sea manganese exploitation would be at best marginal. However, manganese was an important element in the production of steel and the possibility remained tantalizing. The United States was already dependent on imported manganese. The largest reserves of manganese were found in South Africa, Brazil, and Ukraine. Despite its being the twelfth most abundant element in the earth's crust, Western Europe and the United States had exhausted their indigenous supplies and therefore manganese quickly fell under the rubric and rhetoric of Cold War resource security as a strategic mineral. The potential for sea-bed manganese to overcome this deficiency made it an attractive possible source for US companies and the US government.

Stakes: The extractive ocean imaginary

The extractive ocean imaginary was supported by scientific publications such as John Mero's The Mineral Resources of the Sea (1965). Mero prophesied abundant resources sitting out at sea ready to be exploited, overestimating the bounty and downplaying the challenges of extracting minerals from the sea floor. Nonetheless the extractive ocean imaginary would take hold and foster the creation of an extractive ocean legal regime.

The need to locate a secure supply intersected with claims that ocean mining would be viable from the 1980s onwards. This was driven by the belief in the technological superiority of US companies that were looking to spin off high-tech products originally created for the defense industry for commercial gain. However, the 1950s and early 1960s techno-optimism of the US military-industrial complex faltered by the start of the 1970s.

Resource security emerged as one of the unexpected areas of conflict for the Cold War as natural resources took on geostrategic significance. This was not simply a matter of gathering resources by specific nation-states, as there was wider concern with limiting access to geostrategic minerals for unfriendly nations. Essentially only global superpowers and their allies had globally active geoscientific survey and monitoring capabilities required to fight both strategic avenues of this resource conflict – the need both to acquire and to restrict access. In this conflict, the very same accusations could be leveled at both marine scientific research and non-living resource extraction capabilities. Only the richest nations had the capabilities to exploit such knowledge to the exclusion of developing nations, and international control was required to slow the widening economic gap between nations these new capabilities created.

During the 1960s, it was argued that the global ocean was essentially a laboratory for humankind – one where experiments were undertaken to understand humanity's place and power on earth. The unexpected consequence of the scrutiny of monitoring and surveying of the ocean laboratory and the utilization of oceanography to further military operational capabilities in the global ocean fed a growing realization of the human impacts upon the ocean ecosystems and the need for international statutory environmental protection.

Ocean as environment (needing protection)

The "environment" emerged as a new policy area for governments during the 1960s. Governmental and international legal concern with the marine environment pre-dated the emergence of an environmental movement and the rise of environmental consciousness that was perhaps most closely associated with the 1972 United Nations Stockholm Conference on the Human Environment.

Oil was the most publicly recognized sea pollutant but, according to the Joint Group of Experts on the Scientific Aspects of Marine Pollution established in the wake of the Stockholm Conference, there were four other main pollutants: sewage, pesticides (including chlorinated hydrocarbons such as Dichlorodiphenyltrichloroethane, commonly known as DDT), discharges of metals from industry including mercury and lead, and radionuclides produced by the nuclear power industry's reprocessing plants.

Marine environmental pollution was the dark side of the sociotechnical imaginaries of the ocean, a dystopian imagined future of the potentially catastrophic consequences of pollution that most of the international community was keen to avoid. Thus, the ocean became a major site for international policy making in the era of a new environmental consciousness as governments and scientists realized the fragility of the oceanic ecosystem.

In the decades following the end of the Second World War, significant changes occurred in the maritime world that made the need to protect the global marine environment pressing. As early as 1954, the International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL 1954) was drafted and agreed in London before entering into force in 1958 following the establishment of the International Maritime Organization that same year. OILPOL 1954 prohibited the discharge of oily wastes within a certain distance from land and always in port. In these decades the ocean shipping industry underwent dramatic social, economic, and technological change. The size of ships increased while the number of crew per vessel fell drastically, and most significantly large amounts of crude oil began to be transported by new supertankers. The risk posed by increased industrialization of the oceans, from shipping, factory fishing, and marine mining, progressively swung into view as marine science began to show the vulnerability of the marine environment to unrelenting human interaction.

Several major oil spills, notably from the tanker Torrey Canyon (English Channel, 1967), the barge Florida (Cape Cod, 1969), and the Santa Barbara oil rig blowout (California, 1969), stressed the new higher stakes risks faced by the marine environment and associated ecosystems. Other land-based and atmospheric pollution also leached into the seas and entered the marine food chain, moving up from smaller organisms into fish and marine mammals. In 1956 in Minamata Bay, Japan, the effects of a human diet heavy in mercury-contaminated fish were identified: forty-three people died, and many, including the unborn, suffered blindness, muscular weakness, and brain damage. Once the danger of oceanic pollutants was manifested through the visible suffering of this community, it became clear that policies needed to be revised.

Recognizing that OILPOL needed to be updated to reflect developments in the post-war industrialization of the oceans, the International Maritime Organization took the initiative of the 1972 Stockholm Conference to negotiate a new treaty dealing with marine pollution emanating from vessels other than dumping. The resulting landmark treaty, MARPOL73/78, required the installation of shipboard and shore facilities to ensure the retention and proper disposal of oil residues.

At the initial meeting of UNCLOS III, the Italian delegate's opinion that "pollution problems affected all countries equally" was largely shared. Many states were already party to or in the process of signing regional agreements on protecting marine environments. However, Kenya argued that preventive requirements should vary in accordance with states' level of development. Others questioned whether coastal states could impose distinct local standards on dumping and vessel-discharged pollution.

In this period marine research became Big Science in industrial countries, becoming extremely expensive. The pricing out of several nations of the global south from the bounty of ocean scientific knowledge sowed division and conflict.

Conclusions: Imaginaries, national or global

Sociotechnical imaginaries have a powerful agency within science diplomacy negotiations. One national version can, in another national context, provoke fear, and a reactionary imaginary challenges the original in the international arena. Sociotechnical imaginaries also can combine or coalesce into large, shared visions, when nation-states group themselves in international fora.

In the case of the Law of the Sea, multiple sociotechnical imaginaries of ocean science and technology emerged from a more general re-imagining of the oceans during the mid-20th century. They were used to proselytize underwater habitats, endless living- and non-living resource extraction, and expanded uses of the deep seabed. While in developed nations these visions positively drove ocean politics, in less developed states the imaginaries and engendered policies reflected a more cautious and often negative response.

Newly independent nation-states in Latin America, Africa, Asia, and Oceania considered their lack of marine scientific and technical development as a barrier to their ocean economic development. Only through international regulation and control could they benefit from these emerging capabilities. Developed nations – predominately the USA and USSR – had to be prevented from exploiting other coastal nations' marine resources for developing nations to feel able to avoid a new age of imperialism. Developing countries thus asserted territorial rights on the continental shelf, to avert ocean colonialism.

For the global south an alternative marine future was suggested by these sociotechnical imaginaries, one in which rational management of the ocean space required international stewardship of "the blue marble" by the United Nations.

Despite the future's innate uncertainty, it is vital for historians, science diplomats, and scientists to understand the power of sociotechnical imaginaries in making the present.

Study Questions

• Can sociotechnical imaginaries be utilized to set common international goals?

• Do they also, and even simultaneously, represent divergent visions of the future that cannot be easily aligned?

• Considering the three ocean imaginaries (science, resource, environment), when did science diplomacy use its potential for reaching collective international visions? When were scientific and technological developments drivers for mistrust and reactionary policies?

Endnotes

• A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See: Robinson S (2021) Scientific imaginaries and science diplomacy: The case of ocean exploitation. Centaurus 63(1):150-170: doi.org/10.1111/1600-0498.12342

• Cover image: Supertanker; artist's impression by Klaus Bürgle, 1970. Public domain.

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Selected Publications

(2020) Early twentieth-century ocean science diplomacy: Competition and cooperation among North Sea nations. Historical Studies in the Natural Sciences 50(4):384–410. doi.org/10.1525/hsns.2020.50.4.384

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The Frosty Diplomacy of Nuclear Winter:

Scientific Predictions and Their Role in Global Affairs

An InsSciDE Case Study

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The formulation and reception of nuclear winter is paradigmatic of how scientific predictions can work as stimuli for science diplomacy activities and, in turn, inflate or deflate these forecasts' public resonance. Elaborated in the early 1980s, this theory predicted that the environmental consequences of a future nuclear conflict would have been catastrophic, rendering the whole earth uninhabitable and possibly leading to the extinction of humankind. This essay focuses on how the theory took center stage in competing science diplomacy exercises that, on the one hand, encouraged the sponsorship of new research in light of its policy implications for ridding the world of nuclear weapons and, on the other hand, actively sought to remove it because of the negative light it cast on organizations involved in nuclear deterrence.

Source: iStock/Olga_Belova

Keywords:

Cold War, nuclear winter, scientific predictions, NATO, Paul Crutzen, Carl Sagan, public diplomacy, environmental diplomacy

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The Frosty Diplomacy of Nuclear Winter:
Scientific Predictions and Their Role in Global Affairs

How do competing diplomacy ambitions inform the promotion and demotion of international collaborative research leading to scientific predictions? The term "science diplomacy" is often used to underline how governmental and inter-governmental departments promote collaborative scientific initiatives and, in turn, seek to use this collaboration to strengthen relations between the countries involved. But promoting science across borders is hardly ever an innocent and transparent exercise aiming to reward studies with merit. It often aims instead to propel themes that align with (at times hidden) diplomacy objectives. In turn, it may lead to competing sponsorship efforts.

This is especially true in the domain of scientific predictions, namely research-based assessments that define future forecasts, especially at a global level, and inform policy provisions. Forecasts can actually be very divisive according to their policy implications, thus sparking competing efforts to sponsor or deflate novel research.

This case study exemplifies the analysis by looking at one specific scientific prediction, nuclear winter, that became popular within the global scientific community during the 1980s, with tensions between superpowers mounting in what we know as one of the most significant Cold War crises. The nuclear winter hypothesis predicted that a conflict with thermonuclear weapons secured no victory, as the whole earth would plunge into darkness due to the environmental impacts of a nuclear exchange. Nuclear winter was thought capable of rendering the whole planet uninhabitable for the foreseeable future. Even world areas like Australia, not directly targeted with nuclear weapons, would be affected, as fallout would spread globally.

The prediction of nuclear winter soon polarized scientists, political leaders and diplomats across the world along two fronts. Individuals and organizations concerned with blocking the proliferation of nuclear weapons immediately endorsed research on nuclear winter as part of their further campaign. Government and defense organizations directly involved in the exercise of nuclear deterrence sought instead either to stifle the further funding of nuclear winter research, or to fund competing studies proving the scientific prediction wrong.
This essay reconstructs the history of these competing efforts to promote and demote nuclear winter research, particularly in the recognition of the multiple legacies of nuclear winter's "frosty" diplomacy. Today nuclear winter is a notion virtually absent from the landscape of the scientific debate, although it routinely re-surfaces in connection with renewed tensions between nuclear powers such as India and Pakistan (Witze, 2020). Yet the study of catastrophic environmental changes is still a critical item in the global affairs agenda, given the ongoing research on global warming, which has in common with nuclear winter the bleak forecast of irreversible environmental change. Climate crisis is similarly entwined with global affairs with scientific, diplomatic and political communities often divided on what research should be sponsored. Hence, we may be able to understand a great deal more about divergent climate agendas through the lens of the nuclear winter case.

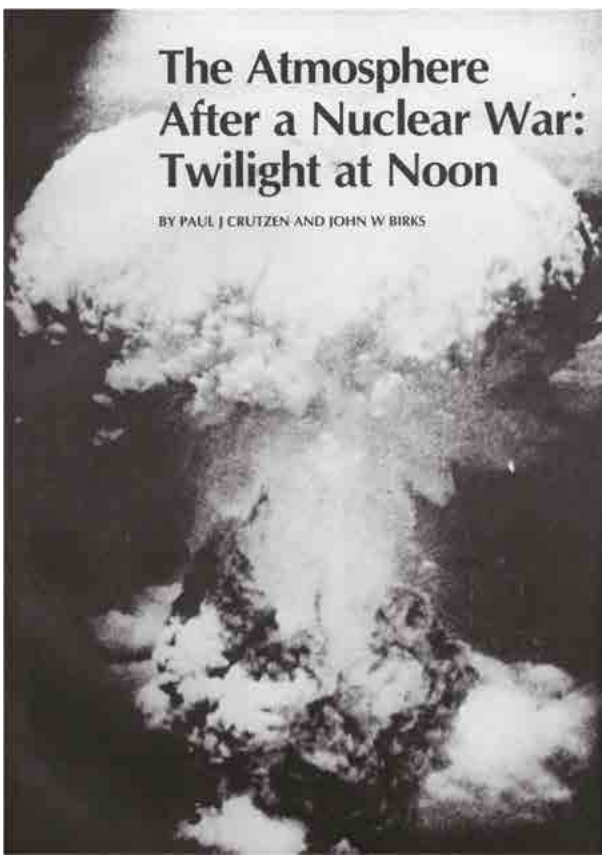
What follows thus examines the positioning of scientists and decision-makers, also as hybrid scientific-diplomatic figures acting as brokers in the promotion and demotion of nuclear winter studies. It first outlines how the concept emerged and divided scientists, diplomats and the wider public. It then explores how competing views lent support to alternative funding strategies. It finally concludes that science diplomacy might fruitfully be considered as a practice that hardly ever supports the promotion of scientific research at large, but rather one that informs the *selection* of scientific themes, topics and forecasts that align to specific diplomatic agendas. Such consideration would bring out, too, the pivotal role played in this practice by knowledge-brokers blurring the boundaries between scientific and diplomatic tasks.

Predicting a nuclear winter

By 1980, a number of new international collaborative projects either focused, or indirectly referred to, the environmental and climatic effects of nuclear explosions, especially given the circumstances of the Cold War and the renewed tensions between blocs. The hawkish stances of the UK Prime Minister Margaret Thatcher and the US President Ronald Reagan fueled the growth of nuclear arsenals to an unprecedented number of warheads. In this new landscape, climate and environmental experts began to consider what environmental effects a nuclear exchange could produce.

Extending his atmospheric studies of the 1970s, the Dutch chemist Paul Crutzen (later Nobel laureate, and originator of the Anthropocene concept) started to research what kind of emissions a nuclear war was likely to release. With his British colleague John Birks, he eventually showed that wildfires generated by nuclear explosions could produce what they called a photochemical smog engulfing the whole earth in darkness. In particular, the releasing of enormous quantities of dust could obscure sunlight, and generate what they termed as a twilight effect (Crutzen and Birks, 1982).

Crutzen and Birks's modeling caused some interest, but not as much as that resulting from the collaboration between US cosmologists James B. Pollack and Owen Toon, who had previously looked into climate-changing catastrophes in both Venus and Mars with the astronomer Carl Sagan and the atmospheric scientists Richard P. Turco and Thomas P. Ackerman. Their scientific article (later dubbed as TTAPS from the authors' surnames), highlighted that the nuclear twilight that Crutzen and Birks had described could irreversibly change the earth's climate (Turco et al., 1983).



Cover page of Crutzen and Birks publication of January 1982 in Ambio. Source: Uploaded by author John W. Birks to ResearchGate. www.researchgate.net/publication/236687098_The_Atmosphere_After_a_Nuclear_War_Twilight_at_Noon

Stakes:

Nuclear winter freezing future global perspectives

First presented to the US National Academy of Sciences (NAS) in June 1982, the Turco et al. study "Nuclear winter: Global consequences of multiple nuclear explosions" showed how dust produced in a nuclear exchange would not only reduce sunlight but also cause long-term effects on the atmosphere and the biosphere. A darkened atmosphere would at first produce critical changes in seasonal weather patterns and then make it difficult, if not impossible, to successfully carry on agricultural activities. The reduced sunlight would also affect climate, making seasons increasingly colder, possibly setting off an Ice Age. These authors thus considered a lasting nuclear winter as a far more plausible future scenario than that of a nuclear twilight.

In any case both the Crutzen and Birks and TTAPS studies predicted that a nuclear war would be catastrophic, possibly rendering the earth uninhabitable. This indirect inference that nuclear deterrence may expose humankind to the risk of extinction inevitably moved the focus of the debate from the scientific to the diplomatic and political tables.

Nuclear winter in the diplomacy and public arenas

Nuclear winter soon became a hotly disputed topic in the framework of the heightened tensions of the early 1980s. Crutzen's scientific findings lent further support to those who viewed recent decisions taken by world leaders as favoring the proliferation of more advanced nuclear missile systems. The findings also heightened the anxieties of nuclear protesters, thereby fueling the peace movements sweeping across Europe and climaxing in one of the largest demonstrations in German history in Bonn's Hofgarten on 23 October 1983. One week later, from 31 October 1983, a two-day conference took place at the Sheraton Hotel in Washington DC, which attracted 500 scientists, activists and journalists. The so-called Halloween conference marked the moment when the notion of nuclear winter moved towards the center of world affairs, re-affirming the catastrophic impacts of a nuclear exchange and, in so doing, lending support to those activists protesting against nuclear weapons.

In December 1983, Sagan went on to capitalize on these catastrophic projections in the context of a forum organized at the US Senate. He also wrote for the non-governmental US Council on Foreign Relations' magazine *Foreign Affairs*, pushing the scientific debate on nuclear winter into a space traditionally occupied by diplomats and international relations experts.

Sagan cautiously argued that "subthreshold" strikes would not necessarily produce a global catastrophe. But could a nuclear conflict be limited to a subthreshold exchange?

The new findings stimulated especially the US government and its defense advisers, but also – at this specific juncture – the North-Atlantic Treaty Organization (NATO), the defense alliance of Western Europe. In particular, the conclusions separately reached by Sagan and Crutzen called directly into question the alliance's strategic posture: following the 1979 Dual Track decision, the allies had deliberated the deployment of the US missiles Gryphon, Pershing II and Cruise to counter the Soviet build-up of modernized SS-18 and SS-20 missiles. These intermediate range missiles increasing tensions between Cold War blocs had been deployed in West Germany, Italy and the UK, while Belgium and the Netherlands continued to debate the new nuclear option in what historians referred to as the Euromissiles crisis.

Sagan's widely publicized nuclear winter also connected to bleak cinematic portrayals of nuclear war. On 20 November 1983, the ABC broadcast *The Day After*, which put on screen how an American family living in the Midwest was exterminated in a nuclear attack. A televised ABC debate followed the film and gave an opportunity to Sagan to publicize his findings further and discuss his predictions with former US Defense Secretary Robert McNamara, the US Secretary of State George Shultz, and his predecessor, Henry Kissinger. The following year, the BBC film *Threads* more vividly depicted the consequences of a NATO nuclear strike including nuclear winter.

Protagonists: Knowledge-brokers pulling the strings of frosty diplomacy

The astronomer Carl Sagan eagerly embraced a new role as nuclear non-proliferation advocate, hence facilitating the transition of nuclear winter from the research laboratory to the corridors of power in Washington DC. By contrast, the physicist Robert Chabbal secretly sabotaged Paul Crutzen's plans to bring nuclear winter research into the NATO science program due to concern about how it would impact on the alliance's role in nuclear deterrence. His colleagues Antonino Zichichi and Edward Teller happily voiced their doubts about nuclear winter while being fully aware of how the resonance of these opinions would inform, as it did, the diplomatic arena. In particular, their brokerage lent further support to DoD and NATO views about the need to give furtherance to nuclear deterrence plans.

Cover image, Science Digest March 1985 issue. Source: Hearst Publications; www.slide-share.net/Revkin/hard-facts-about-nuclear-winter-1985

Promoting and demoting nuclear winter research

Because of its diplomatic and public resonance, the study of nuclear winter took centre stage in various international collaborative sponsorship efforts whose ambitions, to this day, continue to be far from clear.

First and foremost, NATO desisted from commenting on nuclear winter until 1986 to avoid giving resonance to a concept that undermined its strategic posture. But behind closed doors, the alliance's science program (at the time one of the most prominent science diplomacy initiatives across Western Europe; Turchetti, 2018) was re-shaped to stall research subjects that might further display how catastrophic a NATO nuclear attack could be.

In particular, the French physicist Robert Chabbal, then NATO Assistant Secretary General for Scientific Affairs, agreed to delay several projects that could propel public condemnation of the alliance, including those on nuclear winter. Importantly, Crutzen had been invited to present plans for a workshop, and his proposal for a NATO Advance Study initiative on the global atmospheric transport of dust and soot (including a discussion of nuclear winter) was initially earmarked for funding, even if

with a depleted budget (half of what Crutzen had requested). In 1983, however, the NATO Science Committee that Chabbal chaired agreed to postpone several times the completion of studies on "abrupt" climate change, of which nuclear winter was an obvious case. Finally, in this year when nuclear winter became salient to protesters, the topic vanished from the list of NATO workshops to be supported.

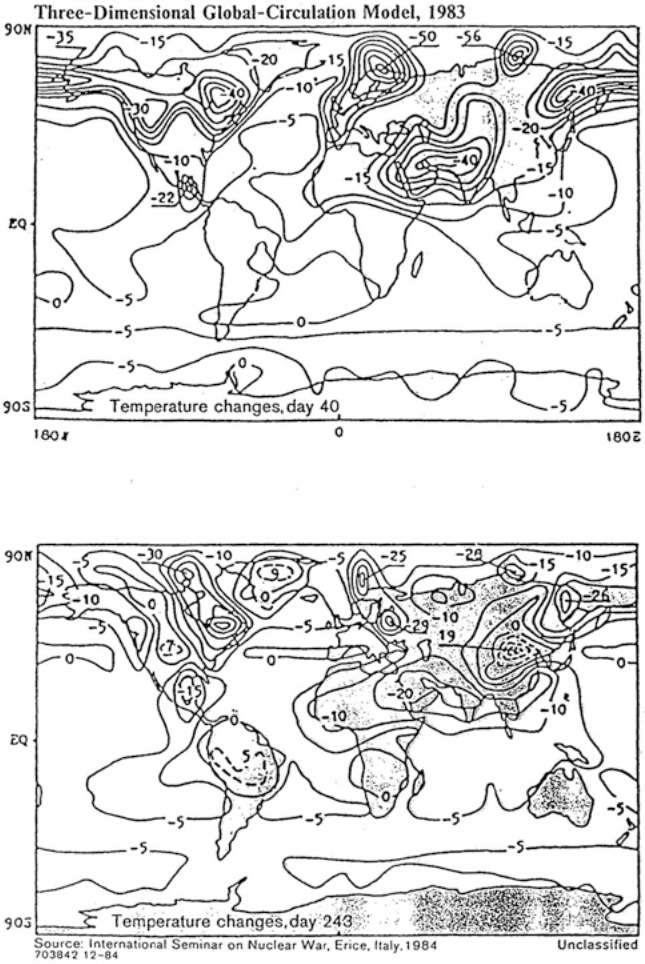
Meanwhile, another group of scientists with ties to the alliance criticized the TTAPS forecast, thus taking to Western Europe a debate already raging in the US and within NATO. The Italian nuclear physicist Antonino Zichichi, who by then had featured in several NATO-sponsored activities, now launched an initiative aiming to remove the catastrophic prediction of nuclear winter from the scientific arena. Previously, Zichichi had launched in 1980 an "International Seminar on Nuclear War" at the Science Culture center in Erice (Sicily). While NATO kept quiet publicly about nuclear winter and stalled funding its research, Zichichi's ongoing seminar became a competing authoritative voice against the TTAPS projections. It also offered a stage to speakers, like the US nuclear physicist Edward Teller, who defended NATO's posture and attacked pessimistic views on the environmental consequences of nuclear war. Teller, the controversial father of the H-Bomb and Ronald Reagan's outspoken science adviser, attended the Erice seminar every year, presenting a strong stance in favor of increasing the US defense budget and developing new defense systems to face the Soviet threat.

The 1984 Erice seminar in particular was entirely devoted to nuclear winter. It mainly featured scientists who had reservations about the TTAPS predictions, and Zichichi declared in the opening statement that there were serious doubts about the reliability of the data that Sagan and his colleagues had used. Teller aptly summarized the invitees' general skepticism and dismissed the notion that nuclear winter would have the predicted apocalyptic effects. His colleagues at the Lawrence Livermore National Laboratory rejected the projections on how fires would alter the atmosphere, also claiming that the troposphere would be affected only marginally. One scientist openly attacked Crutzen, claiming his estimates to be wrong. Crutzen, who was amongst the speakers, but whose article did not feature in the proceedings, replied on the spot. Teller ignored Crutzen and wrapped up the general criticism on nuclear winter with rhetorical aplomb:

Highly speculative theories of worldwide destruction [...] used as a call for a particular kind of political action serve neither the good reputation of science nor dispassionate political thought (Teller in Newman and Stipcich, 1992, p. 325)

Of course one might assume that the demotion of nuclear winter at Erice was exclusively a matter of scientific debate. Yet some of the more mysterious developments associated with the proceedings would actually demonstrate the opposite. The only workshop participant who confirmed the TTAPS conclusions was the Soviet physicist Vladmir V. Aleksandrov on the basis of his computerized models showing global changes in surface air temperatures. But in March 1985, he mysteriously disappeared in Madrid, and the mystery heightened diplomatic tensions between blocs since accusations were made about Soviet and US intelligence being involved in the disappearance. To this day the fate of the Soviet scientist is shrouded in mystery, and so is the knowledge of whether Aleksandrov had put together computer models accurate enough to prove the nuclear winter prediction correct. In any case, the Soviet scientists invited to the 1985 Erice seminar canceled their participation.

Figure 6
Soviet Nuclear Winter Research:
Three-Dimensional Global-Circulation Model, 1983



Aleksandrov's depictions of predicted global temperature changes as presented to the Erice Seminar, 1984. Source: Director of Central Intelligence, 1984.

From diplomacy to conspiracy (and back to diplomacy)

The science diplomacy decisions about sponsorship taken at NATO and in Erice influenced the wider world affairs community. In particular, both the removal of nuclear winter from NATO's program and the conclusions reached by those who convened at Erice (eventually collated in the conference *Proceedings*; see Newman and Stipcich, 1992) facilitated the work of those who wished to consider nuclear winter as Soviet propaganda of limited scientific merit. In turn, these positions helped to elaborate policy measures aligned to this understanding.

This was first the case in the US, where the Department of Defense (DoD) was coming under increasing pressure to review and report on the environmental impacts of nuclear exchange. Unsurprisingly, the Secretary of Defense Caspar Weinberger now drew on the Erice proceedings in the writing of the report 'The Potential Effects of Nuclear War on the Climate'. He concluded that the scientific uncertainties on the phenomenon justified the current DoD security policy. A more extensive review was published in March 1986 and recalled the yet-to-be published presentations on the effects of fire and smoke delivered by Teller's colleagues at Erice.

The DoD could also make effective use of the findings of RAND Sovietologist Leon Gouré who had interviewed Aleksandrov in Erice and filed two reports on nuclear winter. The reports aimed to demonstrate that the nuclear winter prediction was a Soviet conspiracy based on flawed computer models. Drawing on Gouré's interviews, the DoD report now contended that nuclear winter studies had limitations and exaggerated scenarios for propaganda purposes. It also reiterated the effectiveness of current security provisions and, importantly, underscored the utility of the Strategic Defense Initiative (SDI, or Star Wars) as a solution to the nuclear winter scenario. Star Wars famously was a scheme for a space shield enabling the destruction of nuclear missiles on their path to targets. It never really proved more than a science fictional strategic option, and yet Weinberger asserted in the second DoD report that it could be considered an effective way to address the catastrophic environmental effects of a nuclear exchange. Sagan was unsurprisingly angered by the DoD use of nuclear winter to promote Star Wars (US General Accounting Office, 1986).

Now the same scientific conclusions and policy propositions unveiled in the Pentagon reports traveled to NATO and informed the formulation of an official stance on nuclear winter in Western Europe. In particular, the US political scientist Robert E Osgood (Johns Hopkins University) and the German diplomat Henning Wegener (NATO Assistant Secretary General for Political Affairs) prepared a NATO report on nuclear deterrence acknowledging the gravity of nuclear winter but recalling that increased defense systems (e.g. Star Wars) would reduce the risk of escalation. On 14 April 1986, even the NATO Secretary General, the Briton Lord Carrington (Peter Alexander Rupert Carrington), felt inclined to mention nuclear winter, stating, however, that doom-and-gloom projections by concerned scientists like Sagan and anti-nuclear campaigners marching on European capitals were clearly mistaken.

By the end of the 1980s competing positions on scientific conclusions and security policy solidified, while nuclear winter came to occupy a less relevant space in public debates and diplomatic exchanges. Over the following decades, it vanished from the center of the political debate not because its scientific content was deeply flawed, as those attending the Erice conference had claimed, but rather because of its diminishing relevance. For instance, the rapprochement between Ronald Reagan and Mikhail Gorbachev which had started already in 1985 led two years later to the first treaty instructing the removal of intermediate-range nuclear forces (INF), including the Euromissiles, thus ridding the world of the pressing nuclear escalation menace. Yet some of those who had originally authored the TTAPS paper, such as Richard Turco, Alan Robock and Owen Toon, have continued to research nuclear winter and even found that a local nuclear conflict today could have catastrophic global impacts precisely because of its climatic effects (Krajick, 2020).

But with nuclear winter no longer a problematic item in NATO's research agenda, the alliance could increasingly invest in both "abrupt" and gradual climate change studies that the Science Committee representatives had previously forestalled for clearly diplomatic reasons. Many previously un-fundable researchers, including Crutzen, could now receive sponsorship and take part in NATO-endorsed conference proceedings.

Source: iStock/nouskrabs

Conclusions: The mobilization of science for diplomatic agendas

This essay suggests that our understanding of science diplomacy can be deepened by focusing on the role of scientific predictions in world affairs. Similarly to scientific imaginaries (see the InsSciDE case study by Robinson), predictions cast a vision of our future that binds decision-making in the present. Because of this binding, predictions become key features in the arena of world affairs and they have been so especially during the 20th century (and beyond), all the more so as the number and significance of transnational organizations in the geopolitical landscape has grown considerably.

In facing old and new predictions about worldwide catastrophes, whether due to nuclear winter or global warming, there is a tendency to connect science to diplomacy and policy in a linear fashion by assuming that once these predictions gain attention or even consensus in the worldwide scientific community, their study will receive further support. In turn, the results of international collaborative scientific efforts will be ready for use in world affairs to address global problems.

But the case discussed herein shows that there is no linearity in the relationship between patronage of international collaborative research, the exercise of expertise on world affairs, and global decision-making. What this case shows instead is that some officials within national and transnational organizations routinely *mobilize* scientific evidence that aligns to their own worldviews and political ambitions in order to strengthen their diplomacy agenda. In turn, sponsorship offers an opportunity to align scientific predictions to diplomatic goals.

Those at NATO, for instance, sought to shape the scientific debate on nuclear winter through promoting studies that diverted attention to other scientific topics. Removing the prospect of a global catastrophe aimed to reduce the criticism towards the alliance's strategic posture, and thus used the science NATO promoted as a vehicle for public diplomacy too. This essay has displayed the *two-pronged* diplomacy approach that demoted nuclear winter. On the one hand, NATO officials avoided commenting on the controversial scenarios while offering support to competing research that dampened the environmental consequences of nuclear war. On the other, the Erice seminar cast doubts on the predicted environmental consequences of nuclear war.

In this case, furthermore, key policy decisions followed this skewed endorsement of diplomatically viable research. The official endorsement of Erice's conclusions by the DoD, as well as the displaying of the SDI as a persuasive security solution to the nuclear winter scenario, was a decisive factor in persuading NATO officials to offer a commentary on nuclear winter in the NATO report on nuclear deterrence (and in Lord Carrington's 1986 speech) while, at the same time, removing nuclear winter from the set of studies sponsored by the alliance.

A Titan II intercontinental ballistic missile. Source: US DOD.

In revising a simplistically linear understanding of what connects, via the practice of science diplomacy, scientific patronage and expertise in global affairs, it is equally important that we consider the key role that knowledge-brokers play (Raj, 2009) in shaping science-diplomacy-policy iterations. These are hybrid figures often crossing the boundaries between science and diplomacy practices through activities set to align sponsorship and diplomacy objectives and, in turn, give greater resonance to or deflate scientific forecasts.

The history of nuclear winter has thus opened an important window to better view determinants and processes that science diplomacy operations materialize. In particular, it allows light to be shed on some of its key actors as hybrid figures putting to profit their scientific knowledge in the diplomacy realm by selecting research that aligns to diplomatic imperatives and, in turn, justifies and supports policy objectives. Understanding their influence opens a door to better understanding how past and present science predictions have shaped and will shape world affairs.

Study Questions

• What other scientific predictions you can think of have previously or currently gained significance in world affairs? How have they shaped diplomacy and policy initiatives?

• In particular, how does the prediction of irreversible changes to be derived from 1.5 degrees of global warming shape current science diplomacy initiatives and global policy responses?

• Given how knowledge-brokers play a role in connecting science/diplomacy/policy realms, should their role be weakened or strengthened?

• Does nuclear winter belong to the past or is it still "haunting" us?

Endnote

• A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See Turchetti S (2021) Trading Global Catastrophes: NATO's Science Diplomacy and Nuclear Winter. Journal of Contemporary History 56(3):543-562. doi.org/10.1177/0022009421993915

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Space

Space: European Science Diplomacy for Cooperation in a Global Space Competition

David Burigana (UNIPD) and case study authors

Space is a privileged field for the application of diplomacy, due to the multiple interconnections between scientists and diplomats caused by the growing number of scientific disciplines, and national interests involved in the human and robotic exploration of space. In 1968 some US physicists coined the term "space diplomacy" in the wake of the space race. We were in the midst of the Cold War, when space science had already become an instrument of diplomacy in the cooperation agreement signed in 1965 on the initiative of De Gaulle's France. Franco-Soviet dialogue was wanted by De Gaulle as an instrument of pressure in the dialoguewith Washington, in the maneuvers that would have led France to a path of autonomy from the United States, maneuvers that culminated with the exit from NATO in 1966. The start of Franco-Soviet space cooperation in 1965 is therefore a point of departure for InsSciDE's studies.

The case by Isabelle Gouarné is emblematic for identifying actors, practices, limits, perspectives of science diplomacy, as well as its interactions with the "big" foreign policy. Is space cooperation one of the many tools for political-strategic diplomacy? What is actually the weight, the role of science, and of scientists in national foreign policy? How relevant is the aspect of the image between "communication" and propaganda?

In a context of Franco-Soviet experiences that appears a success of space cooperation thanks to a historical analysis, the study by Laurence Roche Nye is thus dedicated to the analysis of the most impactful episode of Franco-Soviet cooperation, the launch of the first Western cosmonaut as well as the first European launched into space in 1982. Through the analysis of the experiments in microgravity proposed for the mission of Jean-Loup Chrétien, the scientists act as diplomats, negotiating French participation in a Soviet mission. Having set the framework for political relations by their respective governments, these "diplomatic scientists" exploit the common language of science to overcome intercultural barriers. It is a dialogue that is not only personal but institutional. The French research centers, the institutes of the Soviet Academy of Sciences create an arena for transnational technoscientific dialogue and exchange.

What is the impact of scientific culture on diplomatic-political dialogue in science is the basic objective of the third case study, also dedicated to Soviet Russia, presented by Olga Dubrovina. Space thus becomes an experience of technoscientific cooperation and competition. This anticipates some elements that will be developed in the years of democratic transition of Russia, in the 90s, in the origins of the International Space Station. Alongside the figure of the scientist diplomat emerges that of the "transdisciplinary" expert who should help overcome the simple promotion of national interest through international cooperation.

It is this passage that appears from the case study on the Europeanization of the Hermes spaceplane, by Anne de Floris, that offers good insight into how stakeholders in Europe have approached science diplomacy in an extremely competitive field, where technological, scientific and political interests may radically diverge among partners.

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

Common to the reflection of the InsSciDE case studies of space is the emergence as a key actor of the "scientist diplomat" on the one hand, and on the other hand, the inevitable consideration of the interplay between scientists as experts and politicians as stakeholders on science and technology at national and international level. This interplay is essential to understand how science diplomacy is used from promoting national interest to international cooperation, to competing globally. Today it is an even more important interplay in light of the new paradigm into which the current international crisis has brought space diplomacy. It is no longer a question of presenting robotic and human space exploration as a mission for all of humanity.

Space is a mirror of the ongoing geopolitical competition/clash. Space diplomacy, or rather science diplomacy for space, can provide an alternative. This alternative can be created around transnational diplomatic objects such as the International Space Station, or the International Standard Payload Rack (ISPR) on board the Multi-Purpose Logistics Modules (MPLM) that contain miniaturized laboratories for experiments in microgravity. Finally interplanetary missions are also diplomatic objects. The necessary condition is to find a healthy interplay between scientists, diplomats and stakeholders first of all at international level. The arena sorted by the European construction process through space diplomacy may be suggested this "new" way.

David Burigana

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Science Policies and Diplomacy During the Cold War:

Space Cooperation in East-West Dynamics

An InsSciDE Case Study

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Presented today as a priority for scientific policies, international cooperation has been a privileged diplomatic tool used since the second half of the twentieth century. It was during the Cold War that this specific use of science was developed and institutionalized within the foreign policy instruments of several states. To analyze this way of internationalizing science, this case examines a founding moment of French science diplomacy: the politically driven signing of cooperation agreements with the Soviet Union. Starting in the 1960s, these agreements were intended to serve de Gaulle's strategy to break from the bipolar logic of western and eastern blocs and his will to advance France's international standing. This case study focuses on the space sciences—the most successful domain of this cooperation and yet the most sensitive. Based on French, Russian, and US sources (archives and interviews), this study analyzes the configuration of actors mobilized by this cooperation policy, the tensions it triggered, and its impact on east-west dynamics.

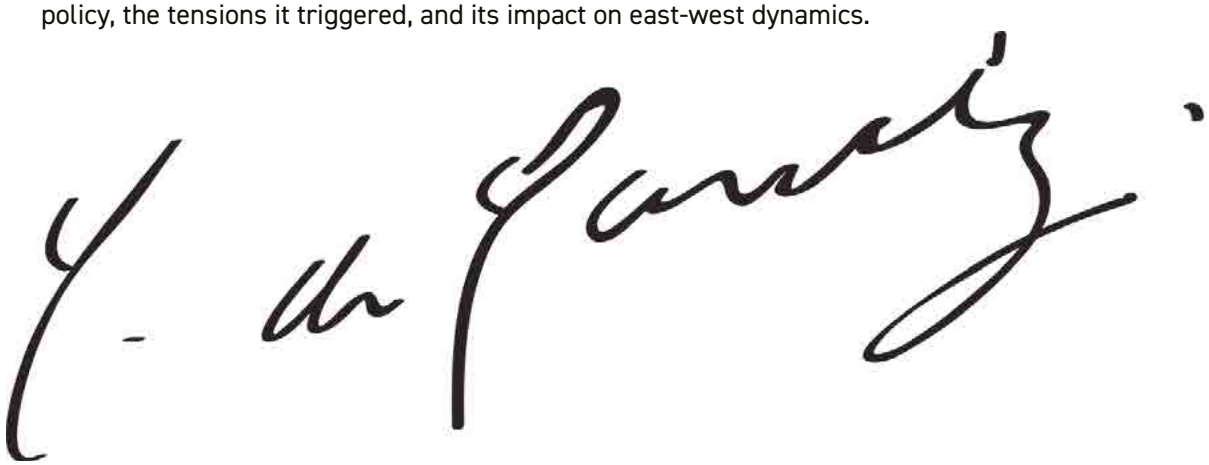

Image credit: Public domain

Keywords:

Cold War; Franco-Soviet cooperation; space sciences

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Science Policies and Diplomacy During the Cold War:
Space Cooperation in East-West Dynamics

The Cold War was a time of intense ideological, military, and technoscientific rivalries. Paradoxically, it was also a period of strong internationalization of science. It was during the second half of the 20th century, in this context of east-west confrontation, that knowledge production became internationalized with the establishment of vast cooperation programs. This process involved a state reframing of the circulation of knowledge and technology. The construction of American hegemony in Europe was thus based on scientific and technological cooperation policies whose aims were not only symbolic – to reinforce the prestige of the United States and counter the attraction of communism – but also strategic, since it was a matter of encouraging or diverting investments towards a particular field in order to orient the techno-scientific programs of foreign powers in accordance with American security interests (Krige, 2016; 2006).

Analyses of the role of science in international politics during the Cold War have often focused on scientific and technological exchanges in the construction of the blocs. New approaches to the Cold War invite us to explore the multiple forms of east-west interaction, long underestimated by a historiography emphasizing confrontation and bipolarity. This case, based on French, Russian, and US sources (archives and interviews), shifts the focus from the European and transatlantic space to French cooperation outside the western bloc, with the Soviet Union. As early as the 1950s, the Soviet state engaged in a policy of cooperation with European countries: its objective was to circumvent the restrictions imposed by the United States and to create a system of western technology transfers in order to meet the challenge of modernizing the country (Autio-Sarasmo & Miklóssy, 2011).

In these east-west dynamics, France played an important role which is still poorly known. In the 1960s, General Charles de Gaulle intended with his presidency to create for France a leading role among western countries in opening to the east (Rey, 1991). De Gaulle's reasons are well known: the credo of national independence, the desire to affirm France's influence and to break out of the bipolar logic. A "scientific and technical cooperation" agreement was signed with the USSR on the occasion of de Gaulle's presidential visit to the USSR in 1966. It covered areas that were at the heart of Cold War tensions because of their military/civilian duality. In many instances, however, this politically driven agreement resulted in cooperation only on paper: actual relations were difficult to establish and remained limited, mainly due to reticence on the part of French scientists. In the field of space sciences, however, it led to extensive collaboration.

Using science to "restore links between countries that officially find it difficult to talk to each other, or even no longer talk to each other" constitutes "the most original dimension of science diplomacy" (Ruffini, 2019). It was also its most paradoxical dimension, at a time when scientific research policy and national defense policy became interdependent, with the military power of a state being based, in the second half of the 20th century, on its technological and scientific resources (Oreskes & Krige, 2014). Our analysis of the space sciences – the most successful, but also the most sensitive area of Franco-Soviet scientific cooperation policy – shows how these sciences were enlisted in national strategies aiming at challenging the American hegemonic logics and the bipolar structure of the international arena. We do not postulate that the meaning of these agreements was clearly defined and identifiable by the actors. Instead, we track the processes of defining this policy of cooperation, its contours, and its meaning. We analyze the configuration of actors that it mobilized, the tensions that could affect it, and the convergences of interests on which it was based – recognizing how these were nonetheless differentiated and sometimes even contradictory.

Three “moments” in the analysis of the 1966 agreement

1. Establishment from the 1950s onwards of instruments of science diplomacy, giving insight into how space sciences could be set up as a “pilot sector” of the Franco-Soviet scientific cooperation agreement signed in 1966.

2. Negotiation of the agreement, in order to understand the division of labor specific to science diplomacy, without portraying it as a simplistic binary process of top-down definition of objectives and bottom-up practical implementation. Although the cooperation agreement was initiated at summit level, it retained a great deal of interpretative flexibility until the scientific institutions and actors designated by their respective governments as “experts” began to work on shaping it, a process far from a simple translation.

3. Franco-Soviet interactions in the implementation of joint projects, to understand the effects of this science diplomacy on the dynamics of the Cold War.

Putting science at the service of diplomacy

General de Gaulle's trip to Moscow in June 1966 was a strongly symbolic moment to mark the inauguration of a policy of rapprochement with the Soviet Union. The president's voyage was dominated by scientific and technological issues and marked by a visit to the prime sites of Soviet technology and science, such as the Baikonur cosmodrome.

It concluded with the signing of two agreements: a general one on “scientific and technical cooperation” and a more specific one on “cooperation in the study of the exploration of space for peaceful purposes”. Thus science and, even more so, space research were from the outset placed at the heart of France's strategy of opening up to the east. The cooperation with the Soviet Union constituted a matrix experience of French science diplomacy, which was nevertheless affected at the beginning by strong rivalries between scientific and diplomatic circles, rivalries from which the space sector drew strength to assert itself as a primordial research field.

A technological site tour during the visit of President de Gaulle (center, glasses) to the USSR, with Soviet space engineer Boris Chertok (center). June 1966. Image credit: Fondation Charles de Gaulle.

Space diplomacy put to the test

Even if Soviet achievements in space could arouse a certain admiration, the principle of cooperation with the Soviet Union was received with reservations by France's Centre national d'études spatiales (CNES) when it was approached by the Ministry of Foreign Affairs in 1965. This reticence was due, on the one hand, to the secrecy surrounding Soviet space activities, which was viewed as a serious obstacle to such collaboration, and on the other hand, to the limited budget of CNES, which was obliged to arbitrate between several international programs. Above all, there was a strong fear that this cooperation with the Soviet Union would limit the cooperation with the United States, on which the French program was dependent; many technological and management skills, particularly in the field of satellites, had been acquired in the cooperation initiated since the early 1960s with the American space agency (NASA). The "risk of retaliation" seemed particularly high. However, very quickly, cooperation with the Soviet Union aroused real enthusiasm, and involvement in the projects initiated in this framework was even the subject of fierce competition between French laboratories. This turnaround was only possible thanks to an intense process of adaptation that allowed the French negotiators not only to match their intentions with those of the Soviets, but also to adjust their scientific interests to diplomatic imperatives. To account for this negotiation situation, it is therefore necessary to conceive of it as a game on two levels (Putnam, 1988), national and international: in this case in the interactions with the Soviets and, informally, with the Americans. In a climate of strong geopolitical uncertainties, following the easing of Cold War tensions in the mid-1960s, French space officials managed to turn this diplomatic demand for cooperation with the Soviet Union into an opportunity to defend their own interests.

Franco-Soviet space cooperation and Cold War dynamics

The international system under American leadership that had emerged in the west after the Second World War favored the early stages of European integration. From the mid-1960s onwards, this produced tensions and attempts to counter this hegemonic logic developed among the countries of western Europe. In the field of space, Europe's actions to provide itself with its own means for space exploration (in particular a launcher) ran into crisis, due in part to its challenging the administrative protection exercised by the United States (Krige, 2016). While the Franco-Soviet cooperation initiated in this context did not provoke a reversal of the east-west relations, it did however have notable consequences for the dynamics of the Cold War.

President Charles de Gaulle (seated, left) signs the French-Soviet Cooperation Agreements with Nikolai Podgorny (right), Chairman of the Presidium of the Supreme Soviet, as Leonid Brezhnev (folded hands) stands behind. Moscow, 30 June 1966. Image credit: Fondation De Gaulle

Conclusions: Asserting a credible alternative world order

Inaugurated in the middle of the 1960s, the policy of Franco-Soviet space cooperation continued without interruption through both General de Gaulle's leaving office and times of intense tension between the two countries. Its decline took place only gradually from the 1980s, when French space diplomacy was redeployed in the European framework. In this sense, these scientific collaborations met the political objective that had been assigned to them: to open and embody a lasting east-west dialogue. However, this success was not foregone. In France, the mobilization of science in foreign political action initially caused tension between diplomats and scientists. It was only possible to enlist scientific actors and institutions in the diplomatic cause; they in turn only accepted this instrumentalization in exchange for the opportunities created to assert their own interests. Illustrating this principle, French space sciences, considered a marginal field of research at the beginning of the 1960s, accessed material and symbolic resources not only to gain prevalence within the national framework but also to counter the American hegemonic logic at the international level. French space sciences were thus legitimated by associating science with certain diplomatic ambitions affirmed at the time of General de Gaulle and never seriously questioned thereafter. They were made into an instrument of rapprochement with the east, in order to re-establish national "greatness" and to leave behind the logic of bipolar confrontation.

While it did not lead to the destruction of the blocs, the policy of Franco-Soviet rapprochement made it possible to assert a credible alternative to the bipolar order inherited from Yalta. The space cooperation established with the Soviet Union was one of the instruments of this policy. It contributed to transforming the peripheral position occupied by France in the game of rivalries between superpowers into a role of east-west mediator.

The CNES was protective of the privileged position it had acquired in the east. Nonetheless the close links it had established served from the 1970s onwards as a matrix for wider Soviet Union collaborations with western European countries and institutions (notably Sweden, the Federal Republic of Germany, or the European Space Agency) as well as with the United States. This international opening of the Soviet Union grew to such a point in the 1980s that the American power, worried, reinforced control over the circulation of technological information during the war in Afghanistan. Calls by the United States for an open, collaborative and international system gave way to isolationist tendencies and secrecy. In 1986, the international missions organized during the passage of Comet Halley marked the climax of this eastern-facing internationalization. These missions engaged two European probes, a Japanese probe, and two Franco-Soviet probes on which American instruments were placed despite prior prohibition by the Department of Defense and the CIA (Bonnet, 2013). The Franco-Soviet cooperation thus paved the way for the integration of the Soviet Union into a global and collaborative system of science and technology. It is through the interactions established in this framework that the progressive opening of the space program of the Soviet Union was negotiated. This cooperation contributed to redefining east-west relations – if not from the technoscientific point of view, then on the symbolic and political level. The Soviet Union in the 1980s in this manner gained the appearance of a more favorable partner in space exploration than would be the United States.

Launch of Soyuz 15. Kourou, French Guiana, 26 August 1974. Source: ru.ambafrance.org/ 50-ans-de-cooperation-spatiale-entre-Paris-et-Moscou

Study Questions

• To what extent did de Gaulle's Franco-Soviet cooperation agreements focus on geopolitical aims or on technoscientific progress? How did those two levels complement and reinforce each other? What risks were involved?

• Why were French scientists and researchers initially reserved and then enthusiastic about involvement in space cooperation?

• How does technoscientific cooperation intervene in the context of bipolar or multipolar tensions today? Which actors take the lead and carry science diplomatic projects? Where do their objectives lie?

• Does science diplomacy today question world order, as de Gaulle's initiative questioned the balance of power?

Endnotes

• A fuller version of this InsSciDE work has been published as a peer-reviewed journal article. See Gouarné I (2021) Politiques des sciences et diplomatie au temps de la guerre froide. La coopération spatiale franco-soviétique dans les dynamiques Est-Ouest. Critique internationale 93(4):157-178. doi.org/10.3917/crii.093.0160

• Readers will be interested in the InsSciDE case studies by A. de Floris, O. Dubrovina, and L. Roche Nye.

• Cover image: A signature by Charles de Gaulle (undated); public domain.

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Life Sciences in Orbit and Cold War Diplomacy:

Scientist-Administrators, Payload and Power of *"Premier Vol Habité"*

An InsSciDE Case Study

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Examining Russia's coercive attempt to reconfigure international relations in Europe since 2014 has prompted reflection on the role of sectoral diplomacy and its vulnerability – or resilience – in the face of conflict. The field of diplomacy in space sciences, when exercised through intergovernmental cooperation between competing spacefaring powers, can be instrumental in regulating tense international relations. At the time of the Cold War, how did opposed entities engaged together in space projects sustain relations amidst the crisis of a divided Europe? To what extent could participants cooperating in gravitational life sciences research interfere in foreign policy? Several technoscientific space projects were successfully achieved under Franco-Soviet cooperation from 1970 to 1992. *Premier Vol Habité*, France's first scientific human spaceflight realized in the USSR in 1982, showcased the life sciences program's capacity to soothe bilateral tensions through the action of scientist-administrators.

Image credit: CNES, public domain

Keywords:

Cold War, cooperation, space diplomacy, scientist-administrators, gravitational biomedicine payload

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Life Sciences in Orbit and Cold War Diplomacy:

Scientist-Administrators, Payload and Power of *"Premier Vol Habité"*

The International Space Station (ISS) is at time of writing the last remaining major space project in which Russia continues to cooperate with the US National Aeronautics and Space Administration (NASA), the European Space Agency (ESA), the Japan Aerospace Exploration Agency (JAXA), and the Canadian Space Agency (CSA). Space cooperation is falling apart elsewhere following the Russian invasion of Ukraine in February 2022. Whatever the rhetorical exchange between Russia's State Space Corporation (Roscosmos) and the sanctioning countries represented on the ISS, life sciences research operated by and on astronauts in orbit still continues.

International cooperation in space sciences and technology can achieve the dual goals of accessing foreign research and development while helping regulate hardened positions of opposed political regimes. In this respect, space diplomacy, an expression coined in 1968 by American physicists, was particularly instrumental in relations between antagonist spacefaring nations USSR, US and France, a (minor) space power in its own right since 1965, during the second Cold War détente (1963-1979). Governmental will to install and develop a sectoral diplomacy in the field of space science and technology would serve to deal with, first, political stakes, and second, scientific purposes.

Among several east-west scientific collaborations established during détente, the Franco-Soviet cooperation on gravitational sciences was remarkable in at least two ways: its uninterrupted duration from 1966 to 1991 whatever the state of international relations, and the extension of research fields beyond those initially agreed upon in 1966 (astronomy, meteorology, telecommunications) to biology and medicine in 1971.

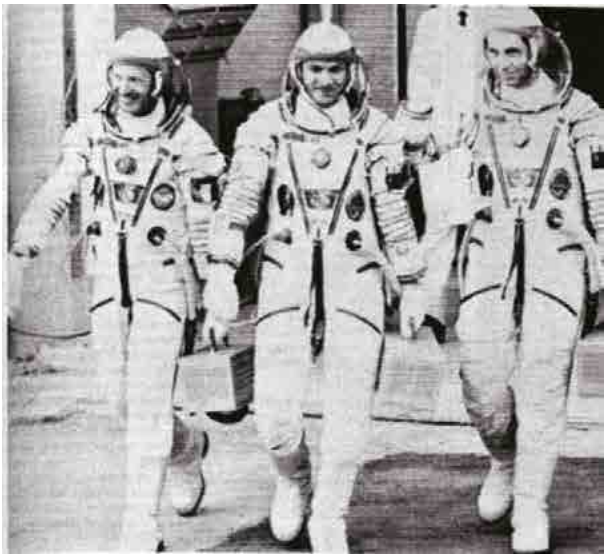
When France decided in 1976 to join the human spaceflight sector – possible only in cooperation with the Soviet Union – the political dimension of the scientific cooperation grew in power, making the endeavor vulnerable to international tensions and threatening its realization.

The human spaceflight mission Premier Vol Habité (PVH) was set under the aegis of the Soviet and the French governments from 1979 to 1982. We look into its preparation in order to shed light on the interplay of the stakeholders involved at a time of newly strained international relations, examining the stakes, actors and actions engaged to preserve the existence of PVH. We argue that the importance given to the life sciences payload by the scientists acting as diplomats was fundamental to counterbalancing the political weight of the emblematic French first human spaceflight mission.

The three-year project was designed by the French National Center for Space Studies (CNES) and the Soviet Council for International Cooperation in Exploration of Outer Space (Intercosmos). From inception to its successful conclusion, led by French cosmonaut payload specialist Jean-Loup Chrétien, commander Vladimir Djanibekov and board engineer Alexandre Ivantchenkov, PVH was considered and communicated as a scientific mission.

The program objective was intended not only to reflect a sustainable relationship on the international stage, but also to foster research in human gravitational biology and physiology pioneered by the USSR since Yuri Gagarin's flight in 1961. Less saliently, PVH's preparation provided a protected channel for the circulation of technoscientific knowledge and prototype devices.

The Soviets' internationalization of the civilian human spaceflight program Intercosmos in 1976 took place partly in reaction to a public announcement by NASA, the United States space agency, regarding the selection of multinational crews to fly on the Space Shuttle. However, Intercosmos was designed first as a scientific cooperation to reinforce political solidarity within the socialist bloc. This capability of Soviet space diplomacy to strengthen alliances was demonstrated in 1976 by an Intercosmos proposal to three of its member states, the Czechoslovak Republic, East Germany and Poland, to train, fly and work on scientific projects on an orbital station. In 1976, the internationalization of human spaceflight addressed only socialist (or some non-aligned) countries.



PVH mission crew, from left to right: Payload specialist Jean-Loup Chrétien, commander Vladimir Djanibekov, board engineer Alexandre Ivantchenkov walking towards launch-pad Gagarin, Baikonur cosmodrome, 24 june 1982. Source: Courtesy of Bibliothèque européenne "La Contemporaine", Université Paris Nanterre, Fonds France-URSS.

PVH mission crew officially pictured in working progress on biology experiment CYTOS. Location: orbital station Salyut-7, USSR territory. Source: "Science in USSR", July 1982.

Origins and establishment of the Franco-Soviet life sciences cooperation in space

Bilateral cooperation in space sciences with the Soviet Union was established during a visit to Moscow by President Charles de Gaulle in June 1966. Three areas were designated: study of the high-earth atmosphere including meteorology; astronomy; and study of outer space with the launch of one French satellite on a Soviet rocket. The space agreement was signed for 10 years with a tacit renewal option. While the subsequent elections of Georges Pompidou, Valery Giscard d'Estaing and François Mitterrand to the French presidency were accompanied by foreign policy changes including the priority given to space cooperation, Leonid Brezhnev's uninterrupted administration until 1982 guaranteed political and financial support as well as institutional stability that allowed extension of the three study areas to the life sciences in microgravity.

As early as 1971, at the annual meeting in Nice, two fields of research biology and medicine dealing with gravity effects on terrestrial organisms were added to the domain of bilateral cooperation. A new working group in life sciences studies was created under the joint leadership of Professor Hubert Planel, known for his pioneering works in radiobiology in the high atmosphere, and General Oleg Gazenko, director of the Institute of Medicine and Biology Problems (IMBP) at the Academy of Sciences of the USSR. The protocol they both signed mentioned: "research in radiobiology on plants germination process, in physiology, observation of the cardio-vascular system, neurophysiology, metabolism and hormone regulation, immunology, and dosimetry" is to be conducted on BION satellites, ensuring a satisfactory observation and measurement practice.

Planning a Franco-Soviet scientific human spaceflight (1976-1979)

In 1976 France proclaimed its intent to send a citizen into space, an ambition supported by some space biomedicine pioneers. Having failed in the 1975 ESA-1 astronaut selection process to send a crew member to the American Spacelab-1 program, CNES turned toward the east. CNES' and Intercosmos' almost uninterrupted ten years of cooperation gave support to the French proposal to extend the technoscientific robotic program to human spaceflight. However, the request would publicly burden an alliance settled at the apogee of détente in the early 1970s – a political harmony which had faded away since. It would make France's attraction to the socialist camp too visible, while shifting one step further away from its traditional American ally status. In order to avoid creating the impression that

France had reversed her alignment – while still keeping open the possibility of hiring a seat on Soyuz – a diplomatic solution had to be found.

In agreement with President Giscard d'Estaing, CNES scientist-administrators Professor Michel Aubert and Professor Pierre Morel made a written (but informal) proposal to Intercosmos vice-director Vladlen Vereshetine to collaborate on designing a human spaceflight mission. As the note below by Aubert indicates, Vereshetine suggested that the request (ideally to be discussed between heads of state) should be framed as a scientific experiment and should not – "at least not openly" – have as its sole objective to fly a Frenchman in space.

This scientific focus would neutralize as well any appearance of boldly favoring the incumbent, in view of the upcoming French presidential election of 1981 (at which date the launch might nonetheless take place).

In April 1979, Valéry Giscard d'Estaing and Leonid Brezhnev signed the "Cosmonaut - scientific mission" agreement, providing for the training and spaceflight of a French person, and sending a strong signal of the capacity of the two parties to converge in the field of life sciences. Study of the human effects of microgravity was a new field of excellence in French fundamental research and crucial for Soviet applied research. The French ambassador to Moscow Henri Froment-Meurice mentioned in his "Moscow Diary" the addition to the mission of a "high-level scientific payload" that would distinguish the Franco-Soviet flight from the socialist Intercosmos flights. This balance was effectively approved by academician Vladimir Kirilline, president of the Small Joint Commission of Franco-Soviet Cooperation and representing science and technology at the USSR Council of Ministers. The outcome was a reconfiguration of the geopolitical object and project economy of PVH. The "high-level scientific payload" thus embodied a power of influence, a soft power exercised by France with the potential to interfere in a Soviet military launch program.

En tout état de cause, la demande française devrait être
présentée au plus haut niveau politique pour être sérieusement
examinée, l'idéal étant d'aborder le sujet à l'occasion
d'une rencontre entre les chefs d'Etat.
Enfin, M. VERESCHETINE suggère que la demande s'inscrive
dans le cadre d'une expérience scientifique et n'ait pas,
du moins ouvertement, pour seul objectif de faire "voler"
un français.

M. AUBERT

Minutes of an (informal) meeting dated 10 September 1976; joined excerpts of pp. 1 and 2. Source: CNES Archives (declassified).

Protagonists

It would be presumptuous to attempt an exhaustive account of the administrative entities, academic networks and individuals involved in the preparation of *Premier Vol Habité*, due to the opacity of the dual military-civil space sector and the difficulty of accessing classified information.

The Soviet space program was dominated by the military, in charge of human space flight missions and launch infrastructures. The science program was designed partly by the Academy of Sciences of the USSR and its affiliated institutes. Among them, three main entities play a role in this case study: IKI, the Institute for the Exploration of the Cosmos; IMBP, the Institute for Medicine and Biology Problems; and Intercosmos, a council of the space program authorities in charge of international relations and located directly in the Kremlin's premises. In France, CNES (*Centre national d'Etudes spatiales*) was created in 1962 as a state agency implementing the national space policy in interaction with the ministry of scientific research, laboratories of the national research network CNRS, the aerospace industry, and numerous contractors.

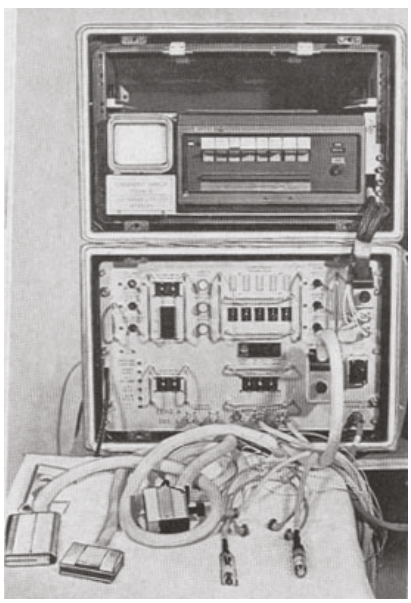
The Franco-Soviet cooperation in human spaceflight was decided by the heads of state Valéry Giscard d'Estaing and Leonid Brezhnev. CNES and Intercosmos assigned scientists to administer the program on both diplomatic and material levels. So-called scientist-administrators developed an adapted regime of interactions characterized by relative flexibility. The relay between the French scientists and the Soviet authorities was ensured by a small number of CNES scientist-administrators such as Pierre Morel, physicist and deputy director of CNES, Jean-Claude Husson, CNES director of science, and Michel Vieillefosse, director of the PVH program. Vladlen Vereshetine, first vice-president of the Intercosmos Council, was a principal interlocutor.

CNES selected among high profile candidates two "spationauts", Jean-Loup Chrétien and Patrick Baudry, both detached fighters from the French air force. They eventually graduated as "cosmonauts" from Gagarin Training Center in December 1979. Jean-Loup Chrétien was assigned to the main crew, whereas Patrick Baudry was part of the replacement crew. They both were trained in Star City according to an adapted spaceflight program, where the military and political aspects were possibly deactivated. Regarding the payload, they were instructed by French scientists from CNRS laboratories of Toulouse and Tours University on the life sciences experiments and prototype devices to be conducted in orbit.
Apparently, career diplomats were but marginally involved in the realization of the knowledge-intensive and highly symbolic cooperation on *Premier Vol Habité*.

Life sciences in orbit: A geopolitical object

Biomedicine research on humans in microgravity conducted by an international crew would start a decisive chapter in the French-Soviet relationship, diplomatically and scientifically.
In the aftermath of the successful Apollo XI moon landing in 1969, marking the end of the "first space race", the Soviet space program had experienced pivotal changes. The Politburo leadership abandoned its lunar program and reoriented to the permanent occupation of the low earth orbit by humans, a fundamental program requiring expertise in physiology and human biology. The Soviet Union had lost most of its greatest biologists during the Stalinist repression of the late 1930s, then during lysenkoism in the 1940s, and in the thaw of the late 1960s it was eager to reestablish its preeminence in these fields. When exchanges with the west partly reopened, scientific cooperation conducted in complete legality could favor a fruitful circulation of technosciences. As the pioneers of a new field of research, gravitational radiobiology and physiology, France was an attractive partner.

In September 1979 an outline was made of the preliminary program of joint research to be conducted on board the orbital laboratory Salyut. IMBP proposed experiments that could be carried out by a "human operator", i.e. an astronaut, in biology and physiology. Biobloc-3 would measure the impact of cosmic rays on small living organisms, while the medical study Déesse-1 would monitor the cosmonauts' blood circulation in microgravity. These two experiments were to produce knowledge crucial for the configuration of long duration flights, a cornerstone of the Soviet space program in the 80s.



Echographe, a prototype used for monitoring human circulation and blood flow in microgravity. Source: Science in USSR, a popular science monthly, July 1982.

Mission stakes

France sought to become visible as the third-ranking space power among the limited circle of spacefaring nations. *Premier Vol Habité* intended to establish, foster and maintain bilateral cooperation channels with the eastern bloc. Because France planned in 1981 two piloted aerospace transportation systems, Solaris and Hermès, PVH also afforded access to knowledge and practice of long-duration spaceflight. Finally, research and development of gravitational sciences would be expanded, with economic spin-offs expected.

For the USSR, cooperation with France was expected to destabilize the traditional alliances between the US and European states. However, the limits of the Franco-Soviet pact were reached when a political crisis over nuclear disarmament broke in the west. During the Euromissile crisis (1977-82) France stayed loyal to the US and signaled continuing attachment to democratic values, for instance the right to freedom of expression claimed by the Polish trade union Solidarity.

According to IKI director Boris Petrov, speaking at the XXVI Congress of the Communist Party in February 1981, "cosmonauts accomplish not only a scientific but a significant political mission". The internationalization of human space flight, making the alliances visible, was instrumental for state branding.

Technoscience as a central geopolitical object in the mission

Mastering long duration human spaceflights was, and still is, a strategic issue. Reducing the risks of cosmic radiation and monitoring human physiology in weightlessness were priority knowledge targets in the Soviet Union's strategy of interplanetary flights and colonization of space.
Prototype devices monitoring blood circulation in microgravity like Echographe were designed and constructed by French industry. Elaborated with high-tech components, some produced in the US, the non-intrusive testing device reflected IMBP specifications. Its delivery on Salyut-7 and transfer of knowledge to the Soviet cosmonauts greatly accelerated the development of long duration flights.

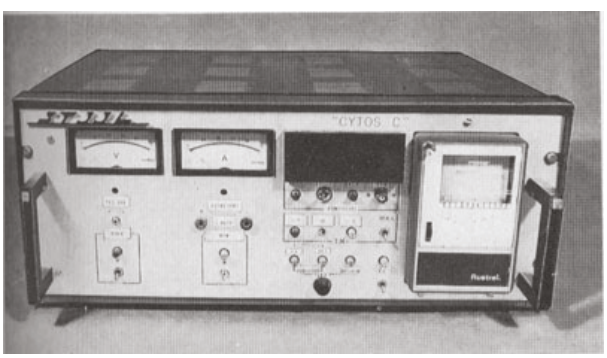
Complex miniaturized devices were produced by the industrial-military complex principally for military programs, and were therefore less accessible to scientific projects. Cooperation with French universities was an opportunity for Soviet scientists to obtain such devices along with the agreed potential to modify them, within a relatively short time and without exchange of funds.

Resiliency to international crisis (1979-1982)

In September 1979, two French air force pilots were selected to begin their training in the Soviet Union, Lt. Col. Jean-Loup Chrétien and Major Patrick Baudry, one of whom would join a Soviet crew for the space flight. One month later, the mission protocol stated that "the flight of the French cosmonaut and the scientific program will be definitively decided at the meeting in Moscow in December 1979".

PVH was immediately put to the test by the USSR invasion of Afghanistan in December 1979. "France seemed to have decided to take the Soviet intervention in Afghanistan seriously, but not to publicly reprimand", commented Ambassador Froment-Meurice. The two newly graduated French cosmonauts were instructed by the French embassy to be ready to leave the USSR. However, CNES' director of international affairs acknowledged some "tensions" without mentioning any withdrawal of the cosmonauts from the program. On the contrary, dialogue was to be maintained, but without complacency, while seeking the advantage.

The updated mission protocol released in October 1980 showed greater structure and depth in medical technoscience. To the initially planned Biobloc-3 and Krovotok-1 were added Cytos-2, Echographe, Pause, Posture – a total of six in-flight experiments making space biomedicine a central research focus. Increasing the protocol to fourteen scientific experiments to be conducted by and on cosmonauts led to an increase in the mass of equipment to be launched by a Progress cargo spacecraft to the orbital station. A clear-cut advantage for the French partner, probably in compensation for France's absence of reprimand regarding the Afghan crisis, the new scientific payload required a total reconfiguration of the mission, both on the ground and in space, both under the authority of Soviet forces.



CYTOS, radiobiological monitoring apparatus. Source: Science in USSR, July 1982.

But Poland's unrest had a much greater impact than the conflict in Afghanistan. In Gdansk, the rebellion of Solidarity trade unionists against the Polish Communist Party spread to several major cities. France's stance in favor of Lech Walesa's democratic movement directly threatened the existence of the PVH mission, the ability to cooperate in space science, and beyond, in Franco-Soviet diplomacy. The French newspaper Libération changed its position in regard to PVH, incriminating "those who cooperated with the Soviet army". The powerful international department of the USSR Central Committee undertook diplomatic intimidation of the CNES director of international affairs and the PVH mission director. They were summoned to the Soviet embassy in Paris to hear that the mission would be canceled if France continued to show sympathy and support to Solidarity. The compromise reached on 30 August 1980 between the USSR and Poland opened the possibility for a solution at ministerial level: the French minister for research and space and the Soviet ambassador reached an agreement, allowing Franco-Soviet relations to relax.

In 1981, the change of government in France interfered in the preparation of PVH. Newly elected President François Mitterrand appointed communist ministers in his government, which displeased the Americans. Mitterrand had then to give the Americans some guarantees. The Farewell double agent case exposed Soviet industrial espionage in France (and led to the expulsion in 1983 of 47 Soviet diplomats). Diplomatic relations were disrupted and PVH was endangered, except for the scientific program which remained the only one to continue. For CNES President Hubert Curien, the situation had become critical; USSR ambassador Stepan Tchervonenko did not hide the fact that PVH was "in a very worrying situation" and that France had to become "more realistic". The only way to avoid halting the program was to further reduce the political dimension of the flight by increasing once again the scientific payload.

However, in doing so, the equipment for experiments would exceed the mass allocations in orbit for flight, which made the launch program even more complex. Here the French were to obtain from the Soviets an additional Progress cargo spacecraft to fly the scientific equipment. The extraordinary negotiation was led by physicist Pierre Morel facing Georgi Beregovoi, the commander of the Gagarin Training Center. In a display of "brinkmanship", as Professor Morel himself put it, the risks for the Soviets were highlighted: the USSR would have to overcome the unpreparedness, or even the failure, of a prestigious international mission with a capitalist state; it would lose a reliable east-west partnership; and this discredit could affect the general economic and financial agreements concluded with capitalist economies. Finally, in terms of material interests, it would lose the transfer of innovative technologies incorporated

in the planned life sciences instrumentation, and thus lose a considerable amount of time in research on long-duration human spaceflights. For France, the mission could be carried out only under the aegis of exceptional scientific excellence; the consequent addition of experiments would require instrumentation exceeding the planned orbital mass. To continue PVH, France demanded the construction and preparation of a second Progress cargo ship. Finally, public communication should dilute all communist references as well as any link with the military sector, and erase the Intercosmos symbols. All of these elements of negotiation were accepted.

Nevertheless, another crisis on European soil affected PVH's launch event. In 1982, the Euromissile crisis put Mitterrand's France clearly in the American camp. Despite the fact that France was no longer part of the NATO integrated military command, the Soviets strongly criticized Mitterand for his Atlanticism. In response, the president decided not to attend the launch of Jean-Loup Chrétien's flight on Soyuz and delegated his government's official presence to CNES President Hubert Curien and the French ambassador in Moscow, Claude Arnaud. Although prestigious, this was not the expected level of official representation, as the Soviet protocol reserved eight places for officials at the level of president or at least minister. Nonetheless, Mission PVH on Soyuz T-6 took off as planned on 24 June 1982.

Left: Portrait signed by the crew of PVH; right: French stamp issued for the launch of PVH. First day cover signed by the crew and by the designer of the Starman emblem, Michel Granger. Image credits: www.granger-michel.com/project/stamps-saliout-cnes/

Conclusions: The diplomatic power of scientist-administrators

Premier Vol Habité was an opportunity: France would gain access to human spaceflight and expansion of its fundamental research capability; the USSR would internationalize its human spaceflight program with a capitalist country and accelerate its applied research capability. France's position on the spaceborne life sciences program found harmony with the aims of the Soviet academics of IMBP, so much so that a member of the French delegation recognized after the safe return of the mission that *"these interlocutors were skillful diplomats"*. The role achieved by scientist-administrators was indeed one of the revelations of the PVH adventures.

For both sides, PVH was a political endeavor. While the involved political authorities were acting within their domain of competence, the scientist-administrators saw themselves pressed into the function of negotiators on scientific and technology issues. For CNES, this was a new role; the space agency gained visibility in France when it emerged as an actor of international relations. In the USSR, the position of scientist-administrator was more familiar; it had already been assigned to the Soviet heads of delegation of the space commission for the supervision of automatic missions as early as 1970. Soviet scientist-administrators were for the most part academicians, held in relations with the international department of the Communist Party. They mediated national scientific and political interests on the one hand and international objectives on the other hand. By formulating an adapted regime of regulations, they triggered an important step in the establishment of a technoscience policy within the classified Soviet space sector, enabling the military-industrial complex to cooperate with capitalist countries.

With a constant shift between the highest political level to that of scientist-administrators and back again, politics and science each offered or ratified at the crucial moment a solution that would enable *Premier Vol Habité* to continue its trajectory across crises. Most striking remains the strong influence exercised at all times by the scientist-administrators, contrasted with the relative passivity of career diplomats. PVH demonstrates above all the asymmetry of space diplomacy activities in international relations during the last years of the Cold War period.

Study Questions

• During the crisis moments of *Premier Vol Habité*, what were the respective roles played by scientist-administrators and political leaders? Did either step out of their expected perimeter?

• Should career diplomats have had or taken a larger role? Why do you think they remained in a relatively passive position?

• PVH's scientific payload played many symbolic roles and embodied soft power. Do other technoscientific objects today carry such symbolism and power in diplomatic transactions?

Endnotes

• Numerous archival documents were consulted; among the most important were
- In Russia : ARAN Archives of the Academy of Sciences of the Russian Federation, directory Intercosmos, Opus 1, Delo 986. (Protocols of the Franco-Soviet Meetings 1966-1989).
- In France : CNES Mémoire d'entreprise, by courtesy of the Centre de Documentation et d'Information du CNES, Paris.

• Readers will be interested in the InsSciDE case studies by A. de Floris, O. Dubrovina, and I. Gouarné.

• Cover image: "Starman" insignia of the Franco-Soviet cooperative flight *Premier Vol Habité*, designed by Michel Granger. Source: CNES, public domain.

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Selected Publications

(2018) Emergence of a space diplomacy: The case of the French-Soviet human spaceflights. Bulletin of the Vavilov Institute of the History of Natural Science and Technology, IIET Annual Congress Book. Janus-K, Moscow, pp 316-319 (in Russian)

(2017) Coopération spatiale franco-soviétique et réseaux scientifiques en temps de guerre froide (1966-1988) : Transferts, circulations, pouvoirs. Doctoral thesis.

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Space Diplomacy in the Cold War Context:

How It Worked on the Soviet Side

An InsSciDE Case Study

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In the time of the Cold War, space diplomacy was an important instrument to cope with international tensions. It was both the means of overcoming conflicts, and the litmus test that revealed the current status of the relationship between two or more countries. Even if the Soviet space sector was more driven by politics and military-industrial objectives, both domestic and international, and much less by scientific interests and researchers' aspirations, the real space diplomats were scientists. They were able to establish a strong relationship with foreign partners, to maintain it using the bureaucratic apparatus of the Soviet system, and even develop it despite the pressures of the Cold War affecting their actual scientific progress. The essential question we ask is: how did space scientists react and, contemporaneously, act as diplomats in this period of great international tension?

Image credit: RGASPI

Keywords:

Soviet space program, aerospace industry, science diplomacy, space exploration, international cooperation, scientific collaboration

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Space Diplomacy in the Cold War Context:
How It Worked on the Soviet Side

The bipolar politico-economic confrontation of the Cold War, which in moments of acute crisis threatened to lead to armed conflict, had to be balanced by mechanisms that could prevent a worst-case scenario from occurring. Various alternative diplomacies served this purpose, including trade exchanges, economic ties, cultural relations and sports competitions (which while certainly reflecting political tensions also deflected them). A phenomenon already known in international practice emerged almost spontaneously and came to great heights: science diplomacy, and more particularly space diplomacy.

One of the most advanced domains marking the ideological and military competition between the USSR and the USA was space, whose exploration became the techno-scientific enterprise required to demonstrate political leadership in the world. Due to the international character of science, not even this domain could escape the initial need of scientists and engineers to cooperate, albeit in the form of competition with continuous measurement against the results of others. Over time the mechanisms of a real collaboration were created and assumed a certain regularity (international conferences), legality (official bilateral agreements), intensity (exchanges of scientific personnel) and depth (joint projects). In this way scientists have guaranteed the continuity of contacts, the exchange of data and information and maintained effective relations even in moments of political crisis between the two powers.

The launch of the first artificial satellite, Sputnik, on 4 October 1957 unlocked three facets of development that could be achieved by means of space technology: (i) scientific research on space (earth-sun relationships, radiation, planets of the solar system, deep space, etc.); (ii) use of advanced technology for economic and industrial purposes and, (iii) military objectives. As is well known, the third facet was emphasized by the Soviet Union to the detriment of the second where, as the American experience has shown, the private sector (absent in the socialist economy) proved to be fundamental. In this great techno-scientific effort, however, the role of Soviet science was paramount despite difficult relations between scientists and political power.

This case investigates the role of the scientists involved in space exploration within the political system and in particular the framework of the Soviet aerospace sector during the Cold War. Their possible impact on decision-making at national and international level is explored, through uncovering the *modus vivendi* of space scientists (astrophysicists, astronomers, geophysicists, biologists, physicians, etc.), their interaction with other protagonists in the sector (political authorities, the military, design engineers), and the modalities of their international collaborations. The research draws on memorial sources widely published in the 1990s following the uncloaking of secrecy around the Soviet space sector, and on documents from the Archives of the Russian Academy of Sciences dedicated to the international activity of the Institute for Space Research (IKI).

Stakes

During the Cold War astronautics became the arena of "demonstration battles" in the confrontation between the two great powers. These symbolized the scientific and technical power of both nations, the achievements of high technologies, intellectual potential, and moral and political unity of society – as well as, according to the USSR, the advantages of a socialist way of life.

The dual military/civilian character of the Soviet space program profoundly affected science diplomacy. All issues relating to the Soviet space program had a very sensitive nature and represented very closed and highly classified information, while by contrast the Americans openly published about their space projects and mission results.

The space industry was a part of VPK (military industrial complex) which reduced room for maneuver by science diplomats, both professional and informal. The industry dealt with national security questions; missiles, spacecrafts, satellites and space stations were designed and produced in the same technical bureaus and plants as the hardware for civilian and scientific missions. Cutting-edge technologies in various fields of science were basically for military use, scarcely introduced in civilian industry, and society didn't directly benefit from the scientific knowledge acquired in the development of the space program.

Like domestic policy, the Soviet space program and its international component relied on and shaped the geopolitical situation. One may surmise that relations in space were a kind of litmus test that reflected the trend of international relations.

Protagonists

Decisions on space activities were the domain of the first secretaries of the Communist party. People involved in the space program recognized Khrushchev's great merit in developing space exploration. He was the first Soviet leader to understand its ideological importance and was therefore willing to grant enormous funding for the technological and scientific development of the aerospace sector.

High-ranking public officials from state institutions and the communist party structure were directly involved in the decision-making process. At least nine central USSR ministries were classified as an "indispensable part of the defense establishment". Chief constructors and upper-echelon engineers had a very important role and were able to suggest new priorities for cosmonautic development, as when Sergey Korolev made proposals to Khrushchev intended to surpass American progress.

Engineers were directly involved in implementing international projects such as "Soyuz-Apollo" and French-Soviet joint initiatives. Few engineers were allowed to enter personal contact with their foreign partners, and most did not speak foreign languages. However, many Soviet scientists spoke French which would help them to establish personal contacts and, in some cases, even friendships with their international colleagues during conferences, encounters, workshops and annual meetings in the frame of different collaborations.

The last very important group of nonprofessional space diplomats were cosmonauts and astronauts. Their visibility and official status meant that they were to carry out an enormous diplomatic task without having acquired the specific knowledge and skills. It is no coincidence that Yuri Gagarin, the first human in space, assumed the unofficial title of "messenger of peace" making numerous trips across the world. The 1962 visit to the United States by Gherman Titov, second man to orbit the Earth, demonstrated the detente between the two countries after the Cuban crisis.

Cosmonaut Valery Kubasov and astronaut Thomas Stafford during the joint Soyuz-Apollo flight, 1975.
Source: www.roscosmos.ru/31867/

S. Korolev (center) flanked by N. Kamanin (L), aviator and head of the cosmonaut corps, and V. Yazdovskiy, space program medical scientist.
Source: http://www.kosmos-memorial.narod.ru/p727aa1.html

The Soviet space program: Technology and science

The term "space" immediately evokes technology and science for historians of the Soviet Union. The field cannot be described without reference to facilities, hardware and devices studied, designed and produced in order to implement manned or unmanned missions in space. A huge aerospace and rocketry industry was responsible for the construction of spacecraft, launchers, satellites, probes, and telescopes. The overarching military industrial establishment developed engines and conducted studies on propellants, rocket ballistics, the performance of construction materials, etc. Ground infrastructures as well were salient, such as the famous Baikonur launch site in the Kazakhstan steppe. It's impossible moreover to evoke space without images of scientific research carried out in astronomy, astrophysics, space medicine, life sciences, meteorology, telecommunications, etc.

The story of Russian space science may be traced back to 1724, when the Academy of Science was founded in St Petersburg. Cosmonautics emerged in Russia at the end of the 19th century thanks to the so-called "founding father" Konstantin Tsiolkovsky. The beginning of space science may be situated at the foundation in 1927 of OSOAVIAKHIM (Society for the Assistance of Defense, Aircraft and Chemical Construction) that developed space exploration using balloons. After World War II collaboration between rocket engineers and Academicians was established, with the leading theorist of Soviet cosmonautics Mstislav Keldysh, president of the Academy of Science, a strong advocate of scientific launches.

At the forefront of space exploration

The intense scientific research across the fields of nuclear physics, electronic radio, missiles and jet aviation during World War II and in the early post-war years yielded evident and practical results thanks also to the research activities of the Academy of Sciences. The Academy saw a sharp increase in its authority when political and industrial management realized the importance of scientific achievements for the future development of their own areas of expertise. According to designer Boris Chertok, the heightened role for science led to a distinctive attitude of political leaders towards scientists. In fact, "the directives given by the Central Committee of the Communist Party of the Soviet Union to party organizations paid special attention towards scientific institutions and scientists. Using the slogan 'Science is a Productive Force', party propaganda helped create an atmosphere of overall admiration for science. The main scientific community – scientists from the Academy of Sciences – was surrounded by attention and honors".

Specifically, it was Mstislav Keldysh who, holding high hierarchical positions both political (as deputy of the Supreme Soviet) and academic (as president of the Academy of Sciences 1961-1975), promoted the leading role of scientists in space exploration. If S. Korolev is considered the technical leader of the Soviet space program, Keldysh would be the coordinator overseeing management of all the scientific segments of both automated and piloted missions. However, unlike Korolev who prioritized human spaceflight, Keldysh stressed the need to make the most of space technology for the development of science, defending the projects for missions to Venus, Mars and the Moon. As A. Jenks states, Keldysh distanced the Soviet space program from the hyper-secret military world of missile forces by assigning public missions to a huge space infrastructure, thus giving visibility and an important role to civilian space exploration and diplomacy.

There were profound contrasts between space academics and the world of piloted cosmonautics. All onboard experiments required substantial investments, and it is not surprising that voices were raised within the Soviet aerospace program against direct spending on the exploration of deep space or planets such as Venus and Mars that, compared to human spaceflight missions, brought fewer exploitable advantages in the military and propaganda spheres.

Beyond the reticence expressed by contenders in the aerospace sector such as missile officers and cosmonauts, scientists faced hindrances rooted in the very nature of the Soviet system itself. With Perestroika the skeletons of Soviet science were revealed to the international community. In 1988 R. Sagdeev signed a sensational article published first in Izvestia and later in the American magazine *Issues in Science and Technology*, pinpointing the flaws of Soviet science: bureaucratization, isolationism, lack of funds, inept planning, and detachment from industrial production. During the Perestroika era such hindrances and deficiencies typical of the communist system, which had prevented the insertion of Soviet science into the international context, finally began to be removed.

The limits placed by the political authorities on the actions of space scientists must be examined in the historical context of the post-war period, when there was a strong demand by the state for scientific discoveries in order to achieve and maintain world leadership. Space scientists found themselves at the forefront of the growth process of the industrial and military potential of a country that had entered the Cold War almost immediately after WWII had ended.

Held hostage by politicians

Space scientists' enforced collaboration with the strategic-military sector of primary interest to the Soviet state was a double-edged sword. This is demonstrated by the following episode in which scientific achievement lost out to other strategic international goals prioritized by political and military institutions.

The first discovery by Soviet and American scientists at the beginning of the Space Age changed the conception of space. Knowledge of the presence in space of radiation belts and their possible effects was fundamental to continue launching automatic missions, and hastened study of their impact on future space pilots. Scientists of both powers vied for the primacy of the discovery and correct interpretation of the belts whose observation became possible thanks to artificial satellites. Soviet scientists launched Sputnik 2 in November 1957 (with Sergey Vernov's instruments on board) and subsequently the Americans put their own Explorer satellite into orbit in January 1958 (under the scientific supervision of James Van Allen). Both communities received orbital data; however, only Van Allen would provide (in May 1958) a correct explanation of the observed phenomenon: currents of particles charged with a large amount of energy captured in the magnetic field of the Earth.

Soviet scientists had had the possibility to pre-empt the Americans: the tools to calculate the charged particles were already available at the time of Sputnik 1. Unfortunately, the scientists of the Institute for Nuclear Physics of Moscow State University remained in the dark regarding preparations for the launch, and woke to the achievement on 4 October 1957 along with the rest

of the world. As the astrophysicist Valery Logachev states, "the whole world was receiving its signal and if our instrument had been placed on the satellite, the radiation belts would have been discovered then." Vernov was able to persuade Korolev to insert his space-ray detector aboard the second Sputnik only by demonstrating the importance of belt measurements to ensure greater flight safety. Regrettably, the scientists themselves could not collect the data and process it as these operations were under military control. Fred Singer, the American scientist and rival of the Soviets in the "race for the bands" summed up the matter: "It seems that excessive secrecy has prevented Vernov and Chudakov from making the discovery and reaping the fruit that belongs to the pioneers."

The third Sputnik, launched on 15 May 1958, was intended to redress the competition by merit of the data logger installed on board. At the last moment a recorder malfunction was identified but Korolev nevertheless authorized the launch, thus depriving Soviet scientists of the opportunity to make further discoveries ahead of their American rivals. Several years later the scientific community learned that Khrushchev had asked Korolev to avoid any delay of the launch of Sputnik 3 in order to lend political support to the Italian Communist Party that was about to face legislative elections (25-26 May 1958).

Baikonur: Launch of Gagarin's "Vostok" rocket, 9 April 1961. Source: TASS Archives via rg.ru/2021/04/09/chto-bylo-za-tri-dnia-do-starta-iurii-ia-gagarina-voskresene-9-aprelia-1961-goda.html

Coming out of the shell

The history of formal international relations in the space sector between the US and the USSR began in 1962 with the signing of the Bilateral Space Agreement on cooperative activities in outer space. Born a year after the first human space flight and after Kennedy's announced intention to bring the first man to the Moon, the document provided for cooperation "for the good of all humanity." While it introduced a new philosophy to what some called the "space race", effective collaboration was limited to data exchange or even coordinated observations, rather than joint design and construction of scientific instruments. Four sectors were designated (geomagnetism, communication satellites, biomedicine and meteorology), but the Soviet Union started cooperation in the exchange only of meteorological data.

A defining moment for the establishment of substantive scientific relations was 1966, when the USSR came out of its international isolation thanks to the agreements with De Gaulle's France that also included collaboration in space. The history of Soviet-American cooperation then is marked by the 1971 Agreement between the Soviet Academy of Sciences and NASA for techno-scientific cooperation in solar system and lunar explorations.

Most likely, real exchange of data acquired by Soviet and American probes took place only some years later. In fact, in 1973, the Soviet Union launched "the Red Army on the assault of Mars": with four probes, the design bureau NPO Lavochkin intended to redeem a series of previous failures that had marked the USSR's Mars exploration. Unfortunately, technical problems again meant that the scientific results did not meet expectations. Soviet scientists decided to give up future automated missions to Mars, leaving this planet to the Americans' Viking program (in fact Soviet launches took place 15 years later with Phobos 1 and 2).

Liaison between space scientists on either side of the Iron Curtain also occurred indirectly. Both Soviet and Western researchers were aware of each other's publications. Yuri Galperin, an expert on the magnetosphere and the Northern Lights, knew about not only the published works of his foreign colleagues but also those that were yet to be printed. Soviet scientific journals publishing USSR astrophysicists' work were accessible in the West. Ian Axford, a New Zealand scientist who studied and worked in England, recalled that he was interested in Soviet magazines such as 'Academy of Sciences Reports', 'Soviet Astronomy', and 'Physical Science Successes' which were translated fairly quickly. "Articles of my interest were published on new observations and ideas in the field of interplanetary space research, in particular, on the measurement of plasma and energetic particles."

However, many of the Soviet scientists' discoveries in the space sector were secret, thereby preventing them from gaining international recognition. Often, strictly scientific topics relating to interplanetary and circumterrestrial exploration were considered in some way connected to the strategic-military field and therefore were discussed *januis clausis* without any publication in Soviet or international journals.

Frustration caused by the lack of international recognition is also explained by the high degree of competitiveness that characterized not only the environment of engineers and designers of carriers and spacecraft, but also of scientists themselves.

Until the second half of the 1960s, travel by scientists in both directions was rare. With the beginning of the *détente* the situation changed. In 1967 the IKI specified the translation of its name in English (Institute of Space Studies, Academy of Sciences, USSR) and established the "*special inokomissiya*" on collaboration with the International Council of Scientific Unions' Committee on Space Research (COSPAR). Soviet astronomers attended the huge Prague COSPAR conference as part of a delegation of 100 scientists in various fields.

Meetings at international conferences had enormous significance for scientific reciprocation. These were rare and exciting moments of personal exchange of data, evaluations, expressions of trust and professional esteem. The sessions attended during the international events brought invaluable gains to the Soviet space scientists despite the surveillance by secret agents and the fear that unauthorized statements or opinions could lead to exclusion from the "*nevyezdnye*" (travel) lists. It was not by accident that the annual report of the IKI emphasized the importance of participating in international conferences to present the results of the research carried out within the Interkosmos program and therefore known only to scientists from the countries of the socialist bloc.

Collaboration, especially with American colleagues, was crucial for the problem of digital calculations in plasma physics. The Soviet shortcomings had to be filled with American technological capabilities which were lacking for various reasons in the USSR, especially in the field of electronics. Scientific complementarity manifested itself also in the comparison of data and information obtained during space missions. From the scientific point of view, the race to the Moon had run its course and it seems that the moment of reconciliation came in 1974 at the Soviet-American conference held in Moscow.

Close cooperation with foreign colleagues had its downsides. On the one hand, Soviet scientists kept abreast of new scientific methods and new Western technologies; on the other hand, as Vasily Moroz wrote, "this situation meant that our knowledge did not develop and we had to adapt to the theoretical and experimental concepts of others".

"Soviet man – be proud, you opened the road to stars from Earth!" Propaganda poster of Soviet space program. Source: Sergei Rzhevsky, www.russiatrek.org/blog/art/

Conclusions: Space diplomacy, a fundamental role for both science and the state

Soviet scientists had been involved in space exploration since the 1940s and contributed to the development of the USSR's space program with essential research in astrophysics, geophysics, astronomy, geochemistry, biology and medicine. Thanks to the rapid development of rocketry during World War II and the demands of the Cold War, when scientific discoveries in the space sector became the necessary means for achieving and maintaining world leadership, space scientists assumed a fundamental role for the Soviet state. Close involvement in the national security sector and therefore the necessary subordination to the military-industrial complex had a strong impact on scientific activity. However, the space scientists managed to safeguard the primary character of science – universality – despite persistent resistance by the Soviet ruling class. The Iron Curtain in the space science sector turned out to be less impenetrable than official Soviet propaganda would have it.

The ideological component of the relations between Soviet power and space scientists served as an instrument of mutual interest shaping international presence. Scientific activity contributed to the prestige of socialism in a cutting-edge technological sector enjoying great global visibility; the scientific community could thus expect further encouragement from political leadership for the development of science. However, the diplomatic vocation of space scientists seems to arise from the natural demands of science that escape any isolationist limitation. Science finds its pragmatic component in the objective need for collaboration in the sectors in which there is a lack of knowledge and experience (electronics and information technology) or simply funding (deep space exploration).

The importance of the goal of solving scientific problems common to all scientists, regardless of their national origin, also went beyond political and ideological conflicts and contributed to the efficiency of scientific diplomacy. The strong push towards international partnerships due to the sheer enthusiasm of people devoted to science, passionate about their projects and enthusiastic to share research results with Western colleagues in the name of human progress should not be underestimated. This said, the idea of scientific universalism rooted in Russian cosmism was widely exploited by Soviet propaganda. Scientific officials, such as the Academician Keldysh, were able to manipulate this vocation of scientists to build strong alternative diplomatic ties rather than official ones that were more subject to the international political situation.

Despite important advantages that the scientific community of space derived from the Soviet system, it also suffered a series of inconveniences imposed by the regime. Research topics were often selected based on the needs of national security managed by the VPK and to boost the political and propaganda impact that was normally associated with human spaceflight. By participating in space exploration which had many military purposes, and in the manufacturing of advanced technologies in the interests of national security, scientists were bound by obligations of secrecy; this carried the cost of even purely scientific research projects remaining undisclosed to the international scientific community for the sole reason that they were related to space. Finally, international collaborations, joint projects, and even the careers of individual scientists remained "hostage" to the international political situation. Despite these limitations, which to a certain extent also existed in the United States, scientists found ways to exist and coexist in the extremely complex and complicated Soviet aerospace sector, skillfully navigating the maze of political, military and scientific institutions by transforming the disadvantages into precious opportunities to be exploited.

"Into space!" Propaganda poster of Soviet space program. Source: Sergei Rzhevsky, www.russiatrek.org/blog/art/

Study Questions

• Under what conditions should international collaboration continue with scientists in illiberal regimes? What is the role of scientific ideals, constructed or not, in this process?

• How do the Russian scientists in the case study use the universal ideal of science to be able to both work for the Soviet state, and pursue science internationally as they want to pursue it?

• What threat do illiberal regimes pose to open science and collaboration between scientists?

• Is the Cold War over in Russian science? What are the current consequences of cold – or hot – confrontation for both Russian and non-Russian scientists?

• Is it easier to achieve diplomatic solutions in the scientific field than in other fields? (i.e. is there any truth to the common conception that science is a field that transcends certain kinds of geopolitical conflicts?)

Endnotes

• Part of this InsSciDE work has been submitted for peer review to Cold War History: "Scientists in the Soviet aerospace sector: Revealing a complicated co-existence".

• Olga Dubrovina presents her study in an InsSciDE Warsaw Science Diplomacy School 2021 case video: https://www.science-diplomacy.eu/aiovg_videos/space-diplomacy-in-the-cold-war-context-cooperation-vs-competition-wsds21-case-study/

• Readers will be interested in the InsSciDE case studies by A. de Floris, I. Gouarné and L. Roche Nye.

• Cover image: First Secretary Khruschev and Soviet cosmonauts (from left: Nikolaev, Gagarin, Bykovsky, Titov). Source: RGASPI (Russian State Archive for Social and Political History) via rg.ru/2016/04/11/rodina-fotografii-gagarina-i-hrushcheva.html

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National Interests, Shared Objectives, and Divergent Priorities:

Interplaying Scales in European Space Policy

An InsSciDE Case Study

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The development of European space activities has blossomed since the 1960s, with an incremental blending of national, regional and international processes of cooperation and competition in space affairs. Formulating a unified European space policy has meant conjugating national interests, shared objectives and divergent priorities. Achieving effective cooperation at regional level can be the outcome of a diplomatic process of influence to gain required capability that could not be reached at solely national level. This is particularly critical in the area of human spaceflight. The story of how the French project of the Hermes spaceplane was Europeanized offers good insight into how stakeholders in Europe have approached science diplomacy in an extremely competitive field, where technological, scientific and political interests may radically diverge among partners.

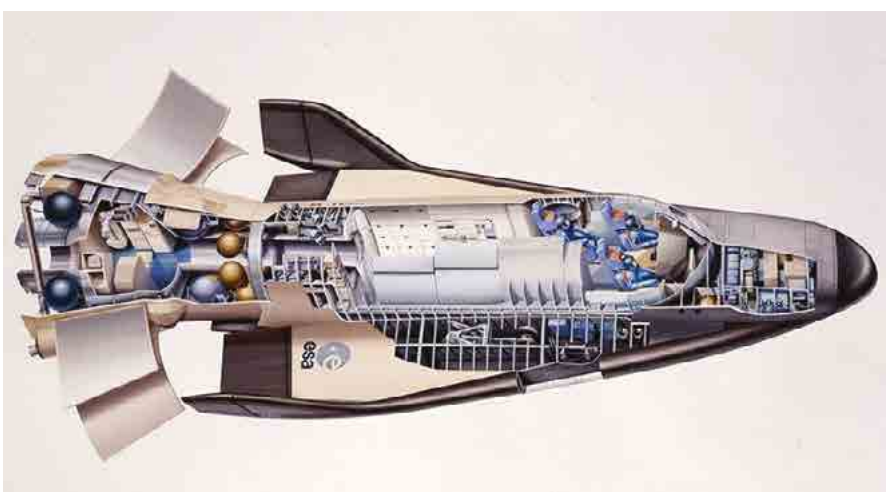

Image credit: D. Ducros, CNES

Keywords:

ESA, Hermes spaceplane, competition, cooperation, autonomy, interdependence, capability, power

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National Interests, Shared Objectives and Divergent Priorities:

Interplaying Scales in European Space Policy

Space activities lie at the crossroads of national ambitions and international achievements. In this setting, how to interest potential partners and make a project attractive enough to foster cooperation while still retaining leadership? Examining European space policy from the point of view of techno-science diplomacy reveals highly productive tensions.

Since Sputnik's first chirp ushering in the space age, the development of orbital activities has been structured by the constant interplay of cooperative and competitive dynamics, ranging from beneficial partnerships to confrontation in the search for optimal leadership. The field of human spaceflight is particularly prolific in diplomatic moves intended to support strategic interests efficiently.

Linking intergovernmental and transnational levels, European space policy crystalizes the challenge of efficient interstate cooperation. Transactions take place between European states. Europe – in the form of the European Space Agency (ESA), the European Union (EU), or both, depending on the context and the historical time addressed – faces foreign states including the major space powers. Negotiations must take place between states with widely diverse, if not completely antagonistic, prerogatives. Considering both successful and aborted attempts in the area of human spaceflight, this case study focuses on the conditions under which a coherent, cohesive and efficient European space strategy might be built. In particular, it examines how the actors of this science diplomacy attempt to promote the fluid interaction of three dimensions: *national interests, shared objectives and divergent priorities.*

Europe's action potential in space exploration lies precisely in this balance. Fostering shared understandings supports Europe's capability to figure on the international scene as a legitimate space power while strengthening its assertiveness as a strong player for future international cooperation, especially in the area of human exploration. This distinction between *capability* – availability of strategic resources, and ***power*** – uses of these resources through international relations either diplomatic or not, in order to gain leverage, is key to understanding how science diplomacy can serve and interact with foreign policy objectives, or how it may evolve and adapt to specific configurations.

ESA Council decisions can be seen typically to fit a pattern of "diplomacy for science": promoting regional influence, presence or interests in international networks. Diplomatic and political action by Council member states to Europeanize an initiative rooted in a national agenda has reflected, at different times, their will to lead, or to reinforce regional cooperation by attracting substantial partners. In any case these examples express the science diplomacy objectives in the context of multilateral coordination of national trajectories: to attract, cooperate and influence (Ruffini 2017).

Krige & Guzzetti (1997) have shown how a unique regional identity can be built through the creation of a strong political, technical, scientific and industrial network. The acquisition and development of space capabilities tells such a story of European construction. The voyage has been characterized by both shared objectives and dissonant priorities; nonetheless, European space policy choices have always reflected the will to cooperate towards significant technical and scientific achievements of geostrategic interest. ESA's foundation in 1975 overstepped the problematic division between the former ELDO/ESRO organizations (devoted respectively to launchers and satellites). Ties between the European Union and ESA then were reinforced through a 2004 Framework Agreement and confirmed by the 2016 Resolution "Towards Space 4.0 for a United Space in Europe". Since the 1970s, Europe has developed a flexible strategy for crewed flight, based on bilateral cooperation with extra-European actors in order to acquire knowledge through embedded laboratories and experiments, or launches of European astronauts in American or Russian infrastructures.

The European Space Agency (ESA) counts 22 Member States: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the United Kingdom.

Created in 1907, the Office International d'Hygiène Publique in Paris, the first international health organization with a universal vocation, is the offspring of this diplomatic process. Between 1851 and 1951, the date of the first international sanitary regulation issued by the United Nations World Health Organization (WHO), nearly a dozen conferences were held in Europe, including the Venice 1897 meeting in the context of the world plague epidemic.

In this journey, the interplay of cooperation and competition has been key. Under diplomatic competition, European space activities led either to successful scientific cooperation (Franco-Russian crewed flight missions; Spacelab) or were radically compromised (Hermes spaceplane). Likewise, a cautiously built diplomatic consensus resulted in efficient outer-space collaboration resting on broad scientific and industrial integration, and in solid international communities of scientists and engineers (the International Space Station). The political competition and scientific cooperation at regional scale generated a coherent spatial policy that contributes to fully integrating Europe as an independent and supranational actor at global geopolitical scale.

Protagonists

The meetings of the ESA Council at Delegate and Ministerial level since 1977 showcase active and on-going science diplomacy, showing its contribution to building a unified European space policy. These conferences are the gathering point of diplomatic imperatives and cooperation on various scales, and are frequented by transversal actors, like those moving in this space from the scientific community to the political arena. Most ESA Council delegates either belong to a national agency with a hard scientific background, or bring their skills (often law or economics) from their position in a ministerial cabinet with a techno-scientific specialization. During Ministerial Council Meetings, these delegates are joined by top-level political deciders, generally ministers specialized in science, research or industry matters.

These actors (among them only very few women), charged with defending technoscientific or industrial imperatives or a national political agenda, generate diplomacy through shaping others' perceptions of those interests. Their multifaceted skill set allows them to perform implicitly as science diplomats within the intergovernmental decision-making process addressing international scientific and technological cooperation.

ESA Director General R. Lust and Chair G. van Aardenne at ESA Ministerial Council Meeting, Villa Madama, Rome, 1985. Source: ww.esa.int/About_Us/Law_at_ESA/Ministerial_Council_Meetings

Diplomatic objects and subjects in cooperative human spaceflight

In the international landscape Europe might appear as a second-tier space power, which has gradually carved out a strategic position at the crossroads of orbital and extra-orbital activities: launchers, telecommunications, applications, scientific satellites, laboratories integrated into stationary infrastructures – and finally, a very particular model of human spaceflight. Unlike the Americans or Soviets, Europe has never committed itself to the integral development of an autonomous human space transport capability, preferring to build up incremental expertise through multiple international cooperative ventures. The European Space Agency has practiced technoscientific internationalism with growing scientific and industrial cooperation, particularly in the field of microgravity experimentation, and with the modular construction of sub-systems and equipment to complete the orbital infrastructures designed by other nations. All this is accompanied by investment in the training and continuing education of a multinational pool of multi-skilled operators, based since 1998 at the European Astronaut Center in Cologne. Thus European space diplomacy, particularly regarding human spaceflight, tends to merge science diplomacy drivers with practices that can also be part of industrial or economic diplomacy.

The astronaut is a good, and maybe unexpected, example of a scientific "visual" diplomacy (Constantinou 2019): embodying a technological enterprise otherwise difficult to visualize in its scale and complexity. The astronaut is physically present in a place seemingly out of reach; an offered body, a bearer of meaning, a true receptacle and representation of a scientific and political program. The cultural iconography attached to the astronaut figure creates a political mascot, conveying through media and propaganda a narrative in line with the cultural values of his or her country of origin. In this way the astronaut serves a primary diplomatic ambition, unifying the population behind a prestigious achievement, promoting the attraction or increasing the visibility and influence of his or her country.

Hermes, a textbook case

When first mentioned in the late 1970s by the French space agency CNES, Hermes was the study of a little spaceplane that could be embedded on the top of an upcoming version of the Ariane launcher and that could perform reentry. It was supported by the considerable personal involvement of influential personalities such as Frédéric d'Allest, Director of CNES since 1982, or Hubert Curien, who chaired the CNES and ESA Councils in the early 1980s, before becoming Minister for Research and Technology in 1984 under President François Mitterrand, who was himself very sympathetic to the concept. Hermes embodied the French desire for a technological program of high value to both industry and national political prestige. Hermes however was abandoned in 1992, not as a technological wreck but a political failure.

Hermes is still a noteworthy demonstration of the evolution from a glimmer in the eye of industry and engineers to the germination of an idea supported by multilateral political partners. The French delegation gradually introduced Hermes into the Council debate over the course of 1984, in order to include the spaceplane on the agenda of the Ministerial Meeting foreseen for January 1985. The minutes of the ESA Council meetings at delegation level reveal the anatomy of influence practiced to promote the national interest in this forum of international consultation. The arguments in support of Hermes deployed by CNES and the French government between 1984 and 1990 testify to efficient planning and exploitation of the gap between national, international and European levels.

A foot in the door

The French delegation used the ESA Council as an international arena to promote their national interest and foster in other Member states a desire for partnership. In 1984 US President Reagan had just offered to open the development of an American space station to international cooperation. Italy and Germany invoked the successful first flight of Spacelab to promote future cooperative missions with the United States. Starting in February 1984, looking forward to the January 1985 Ministerial Meeting in Rome, the French delegation by contrast began to assert the need to provide a long-term plan as a decision-making tool. France argued for a solid policy vision, and emphasized the wisdom of independent and autonomous space capability rather than exclusive recourse to international bilateral cooperation.

During the May 1984 Council the delegation next portrayed autonomy in human spaceflight as a strategic lever not only to develop the capital of existing work but also to acquire new technology. Characterizing NASA's approach to cooperation as taking total leadership through controlled partnership and an exclusive reserve on the Station's core system, the French highlighted the need to secure autonomous access to the ISS from the very beginning of negotiations.

A month later, this idea was presented in the "Outline of a Long-Term European Space Plan", that was mainly well received by all the delegates. Germany insisted on the strong political will required to reach this ambition, while Italy underlined the importance of relying on previous achievements, well handled negotiations with NASA, and great attention to the future potential of launchers and orbital infrastructures expected in the next few years. This last statement allowed French delegates to go a little further and suggest addressing this potential through a coherent and balanced program. At the very least, Columbus – the proposed orbital laboratory, mainly developed by Germany and Italy, and viewed as the European contribution to the upcoming American station – could be designed to integrate with future models of a European launcher. The French delegates thus seeded the idea of the new version of the Ariane launcher, the Hermes spaceplane, and the laboratory Columbus joined in a package deal of benefit to all partners – thereby assuring European adoption of the French project.

Hermes on Ariane-5 launcher. Artist's view by D. Duclos. Source: ©ESA Publications, Photo Archive Image n° 90.03.006-001

From a national project to a European program: Scaling up the national narrative

This strategy was reinforced in October, with the extended argument that a human-rated version of Ariane would offer greater flight opportunities to the scientific community. The discursive network was then gradually expanded to users and stakeholders that might have an influence in the final decision. France remarked that ESA programs did not offer the scientific community many opportunities for in-flight experiments... although the delegation had been asked to increase its financial contribution to the Agency's scientific program. In that light, a human-rated Ariane 5 should be viewed as vital to preparing European autonomy through the acquisition of needed technologies, but also to securing the support and interest of both political and specialist stakeholders.

Science diplomacy was joined by public diplomacy. Early in 1984, President F. Mitterrand had already mentioned in a few interviews the possibility of one day achieving a European inhabited space station. By the end of the year CNES had started a new process to recruit astronauts. The French delegates made their boldest move in December 1984 by declaring their determination to bring the European space program to a new level through the development of a complete orbital infrastructure. Acknowledging how important Columbus was, and how fruitful continued cooperation with NASA would be, they affirmed that, nevertheless, the future must be prepared and that was why Hermes was so crucial. Promoting the spaceplane as a technological program, rather than an operational aim, the delegation underlined its implications for the European industrial space sector and promised the further benefits of public enthusiasm for an attractive venture. With dogged determination the delegation made a final and daring request: to place Hermes on the Rome ministerial agenda, hoping to achieve a new package deal centered around a European orbital infrastructure combining the launcher Ariane 5, the laboratory Columbus, and a reusable orbiter capable of reentry: Hermes.

The Hermes spaceplane connected to the independent Columbus laboratory. Artist's view by D. Ducros. Source : CNES, 1985

The French strategy to consolidate the legitimacy of Hermes and attain the support of the Member states took shape through the organization of debate on the need for European autonomy, in both political and technological terms. Alain Madelin, French Minister of Industry in charge of space affairs, voiced this to the 1987 Council in The Hague, insisting that: "*We must therefore make Hermès-Columbus completely; in our mind, these programs are perfectly inseparable: we cannot build our house on the other bank without building a bridge to reach it, lest we depend on a ferryman jealous of his prerogatives*". Beyond the illusion of a life-saving consensus on Hermes as an obvious choice and an opportunity for Europe, the harsh reality of negotiations between ministers must not be minimized.

Autonomy: An unrequited priority

At European conferences promoting Hermes as a non-mandatory program of the Agency, Germany and the United Kingdom systematically expressed their concerns as to the final cost of the program and its very French nature. Fiscal caution, coupled with commitment to the onerous regular Plan approved in 1987, even led the UK to withdraw planned contributions to the Ariane-Hermes-Columbus triad. A supporter of a moderate space effort geared towards industrial competitiveness, the UK repeatedly denounced Hermes as a throwback attempt to catch up with the Americans and Russians rather than to open up new commercial and scientific opportunities for Europe. From 1985 to 1992, when Hermes was finally abandoned, the United Kingdom voiced many times that the space race era was over and that an "excess of ambition" would foster adoption of "programs that lead to nothing".

The German public cooled on Hermes in light of reports unfavorable to the continuation of major crewed space programs, including an opinion from the German Physical Society which in late 1990 relaunched the latent debate between the scientific community and government deciders. France's Academy of Sciences expressed a similar opinion, confirming human spaceflight's lack of appeal for a majority of space researchers. Apart from the study of human or animal physiology, and medical experiments, the utility of human spaceflight for science was portrayed as limited.

However, ESA's final ministerial level resolution, both in 1985 and 1987, was able to accommodate European partners' hesitations as to technological challenges and costs, while ratifying the new narrative of revitalizing Europe with an ambitious orbital infrastructure on the prestigious pathway to autonomous human spaceflight.

How did space science communities shape others' perceptions of their interests? The Hermes case offers an opportunity to measure their diplomatic action, revealing the power of both scientists and industrial engineers to influence the decision-making process, pulling back the curtain on their involvement in the delegations that prepared ESA Ministerial Council Meetings, and on their communication about space programs. The direct engagement by those epistemic communities with society, and the consequences of these transversal connections, offer a window on the importance of public opinion in power relations. Here, broad-scale influence was in the hands of actors anchored in political, industrial and engineering backgrounds – each fulfilling an ideal image of "the expert".

The intersection between expertise and diplomatic capacity for action materializes in diverse pragmatic ways. It plays out in and benefits from networking (among the traditional "grands corps" formed by France's intellectual and political elite), publicity and outreach activities (where, for instance, scientists may speak out to counteract political decisions). It is seen in professional mobility, both vertical (actors can ascend the hierarchy) and circular (actors exchange positions and share a malleable set of values as well as common professional and extra-professional references). Some inertia is created when particular actors are actively involved in long term projects or policy making while assuming different roles and positions over time.

Space is at the same time a scientific object and medium, a geopolitical issue, a vehicle for prestige, a strategic element of national power; its multiple nature engages very different sets of values and naturally induces competing strategies. Thus the French Academy of Sciences could mobilize against Hermes: as early as 1988, the Space Research Committee issued a very unfavorable opinion in the Academy's public periodical regarding the commitment of France, and consequently of Europe, to autonomous human spaceflight. Alarm was raised that spending for this "ambitious and spectacular space policy" could entail a deficit for both fundamental and applied space research. Acknowledging the Hermes project as the fruit of stubborn political will, yet considering that it did not respond to a clearly identified scientific need, the Committee recommended a clear evaluation of its advantages set against its practical, technical and budgetary drawbacks. The Academy avoided expressing outright rejection but nonetheless exercised a normative role: by placing research at the center of the decision-making process, the recommendation reaffirmed the precedence of scientific issues in the conduct of space affairs – thereby establishing the prerogatives of the professional actor communities associated with that science.

The rooster and the eagle

Interactions between partnership strategies and leadership aspirations highlight an interesting contrast seen between France and Germany. Both key actors in ESA, through the years they have expressed two different visions regarding human spaceflight. France trumpets autonomy and strategic independence; these are at the core of developing the Ariane launcher to secure Europe's own space capability through direct access to outer space. Germany tends to insist on intense cooperation with the United States of America as a royal road to expanded expertise. Before the launch of the International Space Station offered new opportunities and configurations, these two positions faced off directly in the negotiating arenas of ESA.

Hermes before reentry. Artist's view by D. Duclos (cropped). Source: ©ESA Publications, Photo Archive Image n°9 1.09.007-004

Conclusions: Come together, right now

In abandoning Hermes, Europe turned her back on full autonomy in human spaceflight. Yet that capability is not the only possible route to political power through space activities. Could Europe assert global leadership through space diplomacy while still depending on foreign infrastructures to access outer space? Did European modules and astronauts in the International Space Station enhance the perception of Europe as a legitimate space power? What if prestige and primary leadership – a power paradigm inherited from the beginning of the space era – became less important than the ability to act as a legitimate partner in international programs, enriching interdependency? In the end, the European pathway led to power through the co-management of vast exploration programs that are necessarily international and increasingly open to private actors.

Hermes spaceplane was a national project that could not be developed by one country alone. Its Europeanization was a diplomatic means to enhance national influence in an intergovernmental arena of technoscientific cooperation. The Hermes case highlights the possible tensions to be found in national and international relations within the context of European cooperation. This failed experience may be compared with the much larger and successful cooperative undertaking of the International Space Station. The distinct articulation found in each case between leadership and partnership points to the interplay between the promotion of national interests and the need to exist, cooperate and create standing with other actors at global scale.

Accordingly, the recent European space exploration strategy, increasingly marked by converging decision prerogatives of ESA and the European Union, is an outward-looking, internationalistic model of cooperation and even codependency. This contrasts with the competition that was such a strong feature of the Cold War era. The multiplication of exploration programs within the strategies of the other global space powers testifies to this widespread trend, a model flowing from scientific and infrastructural cooperation on the ISS since the late 1990s.

Significant in this regard is the Moon Village program on which ESA has been communicating intensively since 2015, in particular through the voice of the first female European astronaut Claudie Haigneré. The presentation to the ESA Ministerial Council 2016 by then director J-D. Wörner of "a vision for global cooperation and Space 4.0" refers to a permanent Moon base, modular, vastly international, engaging co-dependent actors and collaboration with private companies. "Moon Village is not a single project, nor a fixed plan with a defined time table. It's a vision for an open architecture and an international community initiative." Moon Village would therefore unite not only multiple objectives, but also multiple actors around the ambition to nurture a global technological development cycle with shared benefits. Indeed the Moon Village Association today is composed of 33 institutional partners and 600 participants from more than 50 countries across the world, building up both technoscientific concepts and networks of involvement ranging outwards towards civil society.

"Engineers assess Moon Village habitat". Artist's view, November 2020. Image credit: esa.int

Study Questions

• Is the capability for inhabited exploration of the nearby solar system still a vector of political power in today's multipolar international relations based on co-dependency and cooperation?

• Which might be more beneficial: a pro-active space diplomacy strategy prepared before negotiations, or strategies of influence that produce pragmatic results, but without being theorized as science diplomacy?

• Both science communities and industrial actors are key influencers with a wide range of involvement in space affairs and negotiations. What do you think of science diplomatic practices combining lobbying, influence and expertise?

Endnotes

This InsSciDE work will be more fully discussed in a forthcoming peer-reviewed article: De Floris A. (in preparation) Intérêt national, objectifs communs et priorités divergentes : les jeux d'échelles à l'œuvre dans la politique spatiale européenne.

Cover image: The spaceplane Hermes. Artist's view by David Ducros, ©CNES 1991. "Document extrait du site Internet de l'Observatoire de l'Espace du CNES. Informations protégées - Tous droits réservés © CNES 2022"

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Anne de Floris

Anne de Floris specializes in the socio-political history of human spaceflight in Europe. A graduate of the Ecole Normale Supérieure, she is currently a PhD candidate at Sorbonne University – UMR SIRICE-ED188. In her doctoral research, under the supervision of Prof. Pascal Griset, she investigates the role and impact of human spaceflight in strengthening Europe as a relevant and autonomous space power on the international scene. She has taught at Sorbonne University since 2016.

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(2019) 'Obviously, a major malfunction' : l'incidence de l'explosion de la navette Challenger sur le paysage spatial international et le vol habité européen. Cahiers Sirice 23(2):65-80. doi.org/10.3917/lcsi.023.0065

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Stakeholder Engagement, and Communication: The Warsaw Science Diplomacy School

Sketching InsSciDE's Educational Legacy

Daniella Palmberg
UNESCO, InsSciDE community manager

The following outline foreshadows a publication on the teaching and training experience of our European research project based on history. It mentions open access resources that will be available to all via www.science-diplomacy.eu.

InsSciDE's pilot science diplomacy (SD) training program, the Warsaw Science Diplomacy School (WSDS), showed that history can be a powerful tool to demonstrate the nuances, complexity and skill set involved in the practice of science diplomacy. InsSciDE's Collection of Training Materials invites emerging training initiatives to learn from the project's experience of teaching, discussing and researching SD, as well as provides ready-made resources to integrate into SD education.

The InsSciDE project has developed and tested ways to incorporate history into SD teaching, relying on case studies to exercise reflexivity and strategic thinking, and foster in-depth understanding of SD as a practice. In the past four and a half years, InsSciDE has developed case studies and a European science diplomacy theory and strategy, and hosted workshops, conferences, and a pilot training program (adapted to an online format) tested with 52 early career scholars and practitioners. In the process, the project has amassed a unique blend of insights that may advance how European SD is taught, discussed and, ultimately, practiced.

To whom should the findings be passed on? To SD practitioners (to do their job effectively and intelligently), to scientists (for important awareness, of how their research may be used, and of their role as producers/guardians of knowledge considering political contexts), and to politicians more broadly (for crucial worldly understanding in our interconnected science, technology and innovation-driven age). Moreover, the training approaches should be passed on to the education and training community. This is our intention by publishing not only the present volume of case studies, but also a compilation of training materials to be available on www.science-diplomacy.eu. The collection extracts further lessons from InsSciDE's open conferences and other events on how to influence the way SD is discussed, taught and practiced, applicable to designing panel discussions or hosting interdisciplinary workshops.

How can the results generate long-term impact? A collection of training materials produced by our project allows emerging training initiatives to build on and learn from InsSciDE's experiences of what did (and did not) work in SD training. InsSciDE's unique approach of placing historical case studies at the heart of its training curriculum lays the groundwork for employing the project's broader research corpus towards SD educational initiatives. The content emboldens training initiatives to include certain SD topics that are especially explored in InsSciDE research/training, such as risk, safety and security aspects of SD, or SD in the field of archaeology.

What has InsSciDE learned about teaching SD?

InsSciDE has conducted extensive analysis of participant feedback that enables a clearer understanding of the outcomes of its training program and other events. Future teaching can use the project's Collection of Training Materials to build on InsSciDE's successes and failures, lessons learned and pre-developed resources.

- Value of history in SD training – thinking about history in the "right" way

  • Learning to reflect on history in strategy formulation, without seeking "lessons learned", does not usually come naturally to students but may be a useful skill in a broader diplomatic/political context. The InsSciDE teaching approach used history to enhance the learners' intellectual sensitivity to contextual factors, and ability to rethink at any time during their mission.

  • Incorporating history in SD training may help illuminate the vast networks of actors, competing interests and power dynamics at play in SD, and also illuminate the paradox that while remnants of the past influence the present and future, yet there is no fatalism or determinism in history.

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n°770523, 2017-22).

- Risk, safety and security – underestimated but quickly grasped aspects of SD
    - In WSDS, the modules on the "dark side" of SD were among the highest-rated parts of the training, with students expressing great appreciation for discussion of facets to which many had previously been "naïve".
- Importance of by-design cohorts – the learning environment is an exercise in itself
    - International, interdisciplinary and otherwise diverse student makeup helps build networks, and teaches intercultural communication.
- Appreciation for group work – direct interaction in small groups was a favorite
    - Discussions and exercises in small groups allow students to digest material gathered in plenary periods, advance ideas further, and practice applying them to their own professional contexts.
- Feasibility of virtual SD training – learning, engaging and networking is possible online
    - Tactics include emphasis on small group interaction, hands-on/dynamic exercises and out-of-classroom opportunities.
- Innovative discussion formats – mimicking SD practice in SD discussions
- Encouraging socializing/networking across disciplinary and cultural boundaries – an essential element of training

The visual materials reproduced on the next pages, drawn from our WSDS student directories, memorialize both the diversity of the cohorts, and the efforts of InsSciDE researchers and specialists to create the two editions of the pilot program WSDS (June 2020 and June 2021). These arouse good memories, that were reinforced at the April 2022 post-covid alumni reunion held in Warsaw. The 2020 student and teacher tweets reproduced on the back cover of our book too convey the spirit and value of our interdisciplinary collaboration.

Daniella Palmberg

Daniella Palmberg served as Community Manager of InsSciDE, as a consultant at both UNESCO and Institut Symlog, promoting visibility of the project, writing and publishing news and policy content on science diplomacy, organizing events and monitoring the project's impact. She also supported initiatives of the Science Policy and Capacity Building division of UNESCO. Daniella Palmberg has a degree in public health from the University of Texas at Austin, where she conducted laboratory research on neuroplasticity and post-stroke motor rehabilitation.

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Endnotes

A fuller version of this work is under review and expected to appear as: Palmberg D (2022) The educational legacy of a European research project based on history. Histoire, Europe, Relations internationales, n°2.

See also: Mays C, Hardy S (2022) Experiencing interdisciplinarity: InsSciDE's Warsaw Science Diplomacy School.

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Inventing a shared Science Diplomacy for Europe

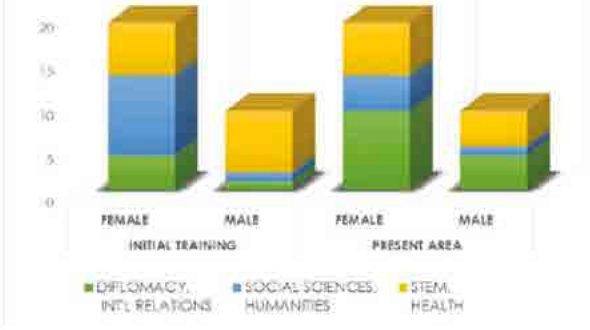
WARSAW SCIENCE DIPLOMACY SCHOOL

Class of 2020: **Get to know our 28 students!**

An interdisciplinary & global spirit

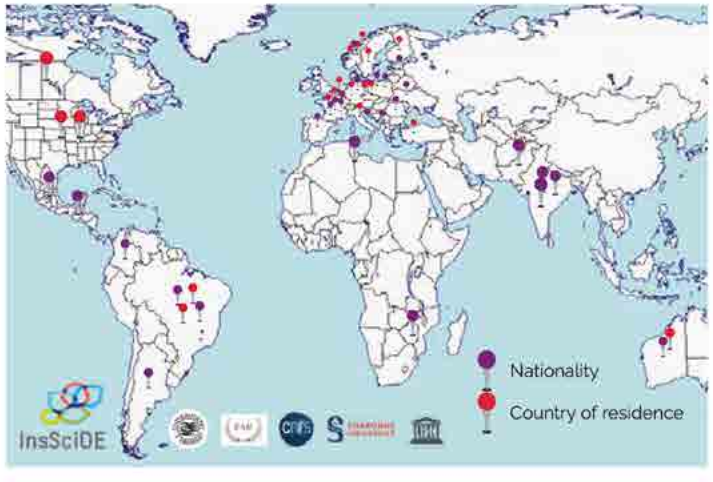
Ensuring a truly diverse group of knowledgable and enthusiastic participants was a high priority for the WSDS as we believe it is a key component in cultivating the inventive and dynamic environment we aspire to. We are proud to welcome a class of 2020 that holds a rich assortment of experiences and ambitions. As is typical of science diplomacy, there are many cross-overs between initial fields of training and present areas of expertise, as well as in national orgins and countries of residence. The adjacent graphic plots the makeup of STEM, humanities and diplomatic training and professional experience among our students, although several hybrid situations cannot be reflected in this simple display. For instance, one of our students is both a medical clinician and a technologist/innovator. Several persons with advanced degrees in public policy are playing international relations roles in large science organizations. The map below shows the global spread of our students' nationalities (purple pins), and, when abroad, where they live/work (red pins).

Initial training and present professional fields of WSDS Class of 2020



Global Representation of WSDS 2020 Students
incl. nationalities and countries of residence

- *10 EU Member States*
- *6 Continents*
- *27 Countries total*



Age & experience

Our 28 students range in age from 25-45 years. The majority have an advanced degree, and many bring a research profile into an operational context. Several have years of organizational experience, with certain of our participants in a position of significant responsibility.

Nominations

Applicants of the WSDS had the option of supporting their application with a nomination from an institution with which they are affiliated. Nominations have connected InsSciDE to almost 20 embassies, national agencies, international research organizations and NGOs across the world, as well as strengthened other relationships. We thank our nominating institutions for bringing forth some of the strongest candidates for our program, and we look forward to sharing invitations to future events and special opportunities.

InsSciDE

Overview: Class of 2021

24 border-crossing students!

An interdisciplinary & global spirit

Ensuring a truly diverse group of knowledgeable and enthusiastic participants was a high priority for the WSDS as we believe it is a key component in cultivating the inventive and dynamic environment we aspire to. We are proud to welcome a Class of 2021 that holds a rich assortment of experiences and ambitions. As is typical of science diplomacy, there are cross-overs between initial fields of training and present specialty areas, as well as in national origins and countries of residence. The adjacent graphic plots the makeup of STEMM, humanities and diplomatic training or professional experience among our students, although several hybrid situations cannot be reflected in that simple display. The map below shows the global spread of our students' nationalities (red pins) and, when abroad, where they live/work (green pins).

Initial training & present professional fields

Age & experience

Our 24 students range in age from 24-44 years. Most have an advanced degree. Many bring a research profile into an operational context. Several have years of organizational experience, with some in positions of responsibility.

Nominations

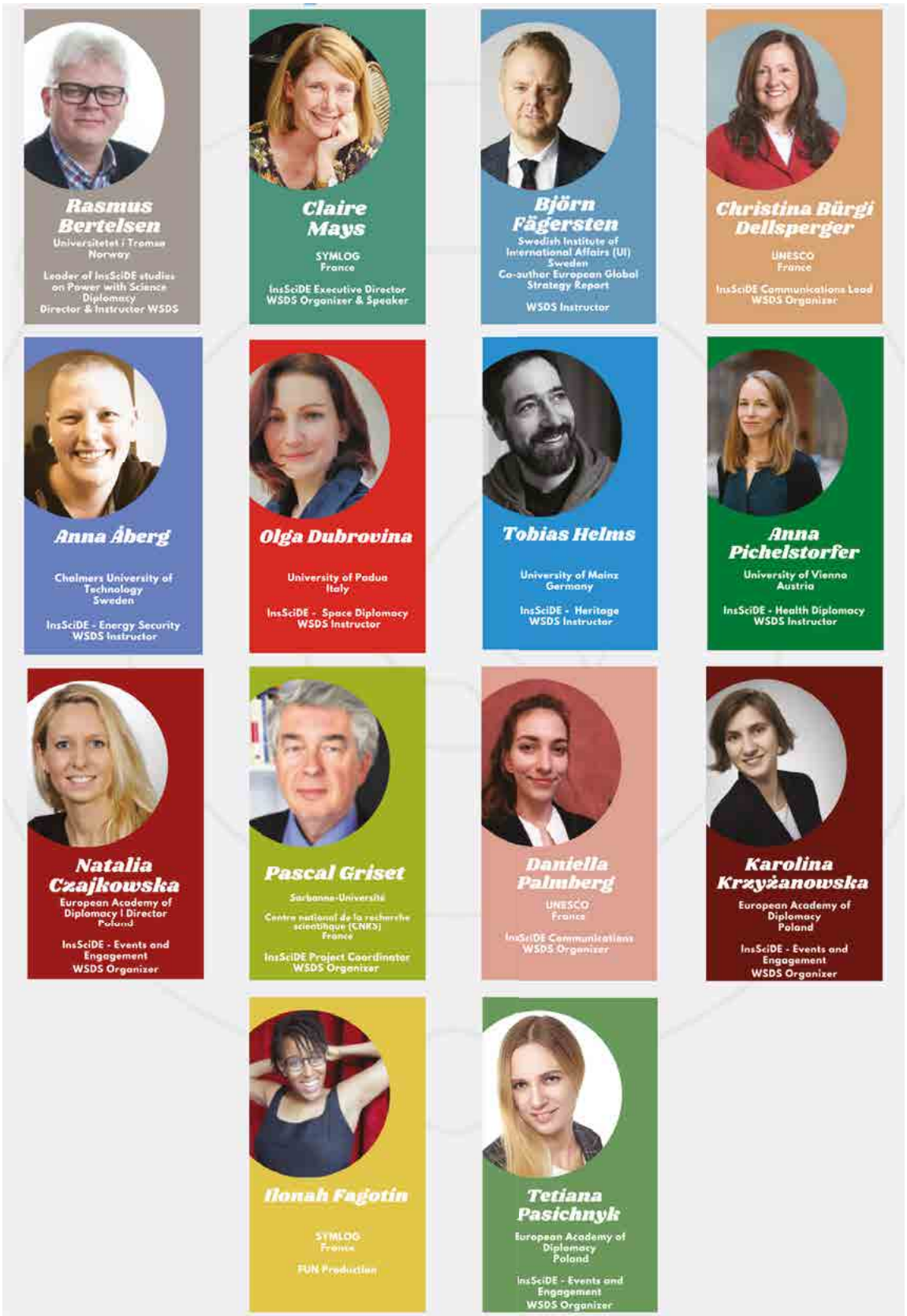
Certain candidates supported their application with an institutional nomination, connecting InsSciDE to 20 embassies, national agencies, international research organizations & NGOs across the world. We thank our nominating institutions for bringing forth strong candidates and will share with them invitations to events and special opportunities - like the WSDS21 Open Session of 21 June!

Global representation of WSDS 2021 students

InsSciDE has received funding under the European Union's Horizon 2020 Research and Innovation programme (Grant n° 770523, 2018-2022)

WSDS-20 Organizers

WSDS-21 Organizers



Behind the scenes at WSDS21

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If the case studies in this volume can constitute a solid basis for teaching to a wide range of audiences, whether for initial or continuing education, their potential is even better expressed in the momentum of a collaborative construction that could allow science diplomats to confront collectively their experiences with those of their predecessors, and to enrich their analysis by crossing it with the highlights proposed by historians. As a vector of communication, these studies are also designed to encourage the various actors of science diplomacy to share their own experiences under the sometimes harsh light of history. The conferences and summer schools organized by InsSciDE have confirmed that contemporary actors find in their predecessors some of the enthusiasm, the concerns, the ways of interacting, and the challenges that they themselves face. Their own doubts and questions resonate within the actors of the past, and lead those of the present time to consider their own initiatives with a fresh eye.

From the introduction by P. Griset

InsSciDE - Inventing a shared Science Diplomacy for Europe - received funding under the European Union's Horizon 2020 research and innovation programme (grant agreement n° 770523, 2017-2022).

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