

Abstracts for 'Science and the First World War: the aftermath'

Thursday 13 September 2018 at the Royal Society

09:45-10:15am

The Yanks are coming: the US National Academy of Science, the National Research Council and the mobilisation of science for war in Europe, 1916-1918

Roy MacLeod, University of Sydney

As recent work has shown, American scientific cooperation with the Allies began well before the United States entered the Great War, and lasted long after Versailles. Following the invasion of Belgium, the destruction of Louvain, and the 'Manifesto of the 93' in October 1914, American science moved with public opinion to protest against German militarism. Through 1915 and early 1916, voluntary university groups sent unofficial expeditions to France and England, a process that became official with the entry of the United States in April 1917. Even before this, conversations within the American scientific community led Woodrow Wilson in June 1916 to request the U.S. National Academy of Sciences, created in 1863, to create a new division, to be called the National Research Council (NRC), with a mandate to 'secure applications of science as will promote the national security and welfare'. If not before, then certainly then, at a stroke, American science went to war.

Once established, the NRC became effectively the 'department of science' of America's Council of National Defence, and quickly developed a nation-wide network of academic and industrial connections that was unprecedented in American society. 'War committees' in twelve disciplines and cross-disciplinary sections, some initially adopting formats familiar to France and Britain, mobilised American scientists, and set them to work on problems ranging from nitrate production to anti-submarine warfare. Within months, proposals and recommendations flowed— often across administrative boundaries – to the Navy, the War Department, and to the French and British governments as well.

Strategically, this experience was to have long-lasting consequences for the organization and direction of American science. For the American academic community, Washington, DC, became overnight a centre of national -- and international -'scientific operations'. Soon came America's first systematic programme of 'science attaches' – which, aided by Academy, saw some of America's best physicists and chemists posted to embassies in London, Paris, and Rome. For them, and for many who received their reports, the war proved climacteric. As George Ellery Hale, the Cal. Tech. astronomer and the NRC's first President, wrote a friend, 'I really believe this is the greatest chance we [have] ever had to advance research in America'.

This paper will trace America's involvement in the 'scientific war' in Europe, and will outline the contribution of the NRC to what became its twin objectives—the winning of the war and the advancement of American science. At the same time, it will outline the early part played by American scientists and their French, Belgian, and British colleagues in rebuilding the institutions of international science, work that began during the War, and continued after the Armistice and into the 1920s. In its wake, the pre-war International Association of Academies gave way to the International Research Council (1919-1931) and, later, to the International Council of Scientific Unions (1931-1998).

This paper will also argue that American academic responses to the scientific challenges and opportunities presented by the War, initially indebted to Allied experience, led by 1918 to a range of innovations in which America soon took a leading role -- from aviation to artillery, naval construction and munitions manufacture; from agriculture and the earth sciences to military medicine and chemical warfare; and from radio communications to scientific intelligence. This experience of wartime cooperation, christened by the Academy, was to shape future relations across industry, the military and academia, not only in the United States, but also around the world, for decades to come.

10:15-10:45am

Science in the city. Munich and the Bavarian Academy of Science in the political and social crisis, 1916-1924

Matthias Berg, Humboldt-Universität zu Berlin

The recent research about European science academies did – different from those to the "classical" academy movement in the 18th century – not pay much attention to the places, where the academies were (and mostly still are) located, usually a capital like London, Paris or Berlin. This is a quite surprising fact, because a lot of the political, economic and social change since the industrial revolution actually took place in those cities, where the academies held their meetings and public performances, where the research commissions worked, and – not least – where the members and the staff of the academy lived.

In my contribution I would like to take a close look on the Bavarian Academy of Science in Munich between 1916 and 1924. An period in which Munich developed from the "quiet" capital of the kingdom of Bavaria to the "Hauptstadt der Bewegung" (capital of the NS-Movement), with the building of the academy in the midst of events like the worker strikes 1917/18, the fall of the monarchy, the "Räterepublik" (councils republic) and the uprising from the political right we know as the "Hitlerputsch" in November 1923. Of course the academy did not keep unaffected from all those developments as their research did as well.

Unlike other German scientific academies, the Bavarian Academy had succeeded in a kind of institutional development since the outbreak of war in 1914. Besides the usual nationalistic speeches, the academy developed several new territories of activity closely connected to the war itself. What did happen with those "war-oriented" research, did it just disappear due to lack of resources or moved it further on? The representatives of the academy were among the most respected members of the Munich urban bourgeoisie, which academic positions represented those men, while their social and cultural positions were endangered? How could they deal with new developments like women in science or demands for participation of other social classes? Actually, I would like to ask for the role of science in the city.

10:45-11:15am

'The Commission would have been definitely appointed if the war had not supervened': the International Meteorological Organisation and its Commission for Agricultural Meteorology after WWI

Giuditta Parolini, Technische Universität Berlin

WWI was a war of famine and starvation for both soldiers and civilians in Europe. Labour shortages and scarcity of fertilisers and pesticides considerably lowered agricultural productivity. The food crisis affected all the countries involved in the conflict revealing the overall fragility of national agricultural systems. The German turnip winter of 1917, caused by the failure of the potato crop, was just the most famous episode of the general collapse of European agriculture during WWI.

The war experience heightened interest in agriculture and in the adverse impact of human and environmental factors on agricultural productivity. Improving the resilience of agricultural systems was high on the research agenda, when European countries returned to scientific and technological cooperation in the aftermath of the conflict. The Commission for Agricultural Meteorology set up by the International Meteorological Organisation (IMO) is an interesting case study of these post-war collaborations in agricultural development among former enemies on the front line.

Meteorologists, botanists, agronomists, plant pathologists and geographers, mainly based in Europe, staffed the Commission, whose task was to examine the influence of meteorological factors on crops, horticultural produce and livestock and liaise with national agricultural and meteorological institutions to improve their actions. If WWI halted the original plans for instituting the Commission, after the conflict the relevance of agricultural issues became uncontested and in the interwar years the Commission constantly met to share national experiences and allow its members to benefit from each other's best practices in agricultural meteorology.

The paper will address the role that the Commission had in strengthening collaboration on agricultural matters across European nations and how key actions for improving the resilience of agricultural systems – such as weather warnings and frost protection – were discussed in its meetings and implemented in its resolutions.

12:00-12:30pm

Friends in deed. The Emergency Society for German and Austrian Science and Art in the Post World War I struggle for scientific continuity, 1920-1927

Brooke Penalzo Patzak, Universität Wien

In early 1920 a group of prominent German Americans with involvements spanning the sciences, finance, and public welfare met at the invitation of anthropologist Franz Boas to establish what would come to be known as the Emergency Society for German and Austrian Science and Art (ESGASA). Envisioned as a temporary organization to unite North American initiatives to aid intellectual interests in Europe at large, member dedicated donations for specific countries and the emergence of parallel organizations with nation-specific allegiances challenged the international design from the first, and the society soon tightened its focus to Germany and Austria.

In spite of the breadth of its works and the prominent individuals and organizations involved in gathering, dispersing and receiving ESGASA funds on both sides of the Atlantic, the society remains little known. Over the course of its short existence this privately funded initiative gathered over \$100,000 - a contemporary equivalent of around \$1,380,000 - which was disbursed to over 220 beneficiaries, in large part according to recommendations made by ESGASA foreign advisors Friedrich Schmidt-Ott of the Kaiser-Wilhelm Gesellschaft in Berlin and botanist Richard Wettstein in Vienna.

At first glance, it is difficult to imagine what confluence of motives may have influenced the highest recurring disbursements to recipients as varied as the Deutsche Orient-Gesellschaft and Thesaurus Linguae Latinae in Germany, and the Biologische Versuchsanstalt in Austria. Upon more thorough analysis, however, patterns emerge that provide new insight into inter-war attempts to foster multi-generational socio-professional continuity across the rugged and labyrinthine landscape that stretched from late nineteenth century science to inter-war period. Based on archival documents housed in the US, Germany, and Austria, this research presents an intimate portrait of the ESGASA through an introduction to the society's development, aims, disbursements, and an analysis of those disbursements with special attention to scientific networks in which they were embedded.

12:30-1:00pm

Binding the wounds of war: internationalism and national interests in the new order of world science

Danielle Fauque and Robert Fox, University of Oxford

As the Great War drew to a close, Britain, France, and Belgium took the lead in organizing a series of three “Interallied” conferences. The debates at the conferences, in London, Paris, and Brussels, resulted in the establishment of a new world-order for science in which the former Central powers had no place. German and Austrian scientists found themselves excluded from the International Research Council and its associated disciplinary unions, and even the use of German language was forbidden at conferences held under the IRC’s auspices. In this paper, we explore how this division within a community that had always prided itself on its capacity to transcend national boundaries came about and how it affected the conduct of science on into the 1920s. The result is an object-lesson in the pliability of the whole notion of internationalism in a period when national interests and memories of the conflict continued to loom large.

2:15-2:45pm

Scientists as diplomats? The Commission for Intellectual Cooperation of the Society of Nations

Dr. Jonathan Voges, Leibniz Universität Hannover

The Society of Nations (SDN) is often regarded as a failed project to secure world peace after the atrocities of the First World War. The international conflicts of the 1920s and even more in the 1930s were clear signs of its impotence (last but not least the outbreak of the Second World War 1939) – and, as Mark Mazower observed, especially that impotence was what the Great Powers wanted. But on the other hand there were the functional sections of the SDN; their importance grew in the 1920s, did not stop to develop in the 1930s (even though the financial crisis of 1929 had its impact on their work) and in 1938 they were described in the so-called Bruce Report as the key elements of a future organisation to unite the nations. Again in the words of Mark Mazower (and in comparison to the powerlessness of the political part of the organisation): “The internationalism of technical, intellectual and scientific specialism, proved its value through what it did.”

One of these technical sections of the Society of Nations was the International Commission for Intellectual Cooperation which became more capable of acting in the middle of the 1920s when the French government donated the SDN an International Institute for Intellectual Cooperation (which had to be situated in Paris). In my paper I want to discuss how the Commission and the Institute acted in the field of natural sciences – and of social sciences, which became part of its working program because of the recommendations of the American member of the Commission James T. Shotwell from the 1930s onwards.

Why did an international organisation like the SDN acted in the field of sciences? What were the aims of its engagement? Who were the actors who played the leading roles in the work of the Commission and the Institute? Which were the means to reach a new international organisation for science after the First World War? And what was the role of scientific experts in the diplomacy of the interwar years? Did they function, as Ghebali, one of the first researchers who analysed the technical sections of the SDN in the 1970s, stated in opposition to classical diplomats: “The taking of functional activities from the hands of professional diplomats and their devolution to experts free from national bias who developed and esprit de corps as a result of working together on a permanent basis, was perhaps one of the most valuable innovations of the League.”

2:45-3:15pm

Measuring performance and will: psychology in Great Britain and Germany during and after WWI

Andrea G. v. Hohenthal, Albert-Ludwigs-Universität Freiburg

Before the First World War the psychological societies of Great Britain and Germany were deeply connected with each other through friendly relationships and scientific communication. These relations were only partly disrupted during the war. The psychologists of both countries (a.k.a. members of the societies) committed themselves to the military demands, worked in similar fields, but in different ways. They differed in the involvement in military psychiatry and in their treatment of shell shocked soldiers. The activities of those psychologists were observed and commented by the other side, but there were no hostile remarks against the enemy and soon after the war the scientific exchange began again. Although connections after the war were close, the development of military psychology differed in many ways. As a result of the psychotherapeutic work with soldiers and officers who had developed war neuroses, the influence of the character and the willpower of the soldier on their achievement and man power were seen in a different way. In Great Britain, the focus of the training for soldiers lay on military values like the morale of the troop, the spirit of the group and good leadership, together with profound insights into the psychological laws and the nature of men. In Germany, there was a strong emphasis upon the character and willpower of the single soldier, which could be influenced by training and force. Here psychologists qualified as experts for the measurement of character and will. Different views of the character and psychological nature of men, together with the different situation in both countries (defeat versus victory in WWI) influenced the development of diagnostic and therapeutic tools in both countries, especially in the field of military psychology.

4:00-4:30pm

“International science is bound to win”: an astronomer’s efforts for scientific cooperation.

Florian Laguens, Panthéon Sorbonne University, Paris

Arthur S. Eddington (1882-1944) certainly was the world’s most famous astronomer during the interwar period. For thirty years he was the director of the Cambridge Observatory and taught astrophysics at Trinity College. His directorship started out in 1914, and the First World War left a lasting impression on him.

In 1916 Eddington published in *Nature* an article calling for an international scientific cooperation. It struck up a tense exchange with Joseph Larmor – their correspondence being held among the archives of the Royal Society. In the same year, Bertrand Russell was fired from Trinity College after having published an antimilitary pamphlet. Eddington raised several times in favour of his colleague and never ceased to hope for his reintegration. Coherently with his pacifist ideal he refused to enlist, first in 1916 and again in 1918. The *Cambridge Daily News* gives some details about the trial during which he finally declared to be a conscientious objector. His rejection of war was in fact based on religious grounds and it heavily threatened his activities in the Cambridge Observatory. The tension among the astronomers’ international community was obvious, but Eddington did his best to preserve some personal contacts with foreign colleagues and even with German institutions. In 1919 he wrote Elis Strömgren: “International science is bound to win and recent events – the verification of Einstein’s theory – has made a tremendous difference.” The 1919 eclipse expeditions indeed represented a strong signal to the international community, English scientists having tested the theory of a German colleague. On several occasions after WW1 Eddington tried to re-establish international relations within the scientific community. A great

deal of unpublished material provides valuable information about his intentions and actions at that time. The concern he expresses to Willem De Sitter and Oliver Lodge, the isolation he entrusts Harlow Shapley, the admiration he confesses for Karl Schwarzschild, all of these reveal the unique temper of Arthur S. Eddington.

4:30-5:00pm

How the First World War shaped the international reception of Einstein's Theory of Relativity: the case of Belgium (1914-1925)

Sjang ten Hagen, University of Amsterdam

Albert Einstein and his theory of relativity acquired world fame just after the First World War; a war in which Belgium particularly suffered. The burning of the university library in Louvain, the country's premier university town, was the concrete *cause célèbre* for the infamous 'Manifesto of the 93', which soured international academic relations for another decade. The extensive literature on the reception of relativity has established that these events strongly coloured the perception of relativity in Allied countries. But what was the reception of relativity in Belgium itself? And how does that reception history compare to that of Belgium's neighbouring countries?

Due to the German occupation of Belgium during WW I, scientific communication came to a virtual standstill and all Belgian universities were closed. I show how these circumstances played a direct role in Belgian physicist's Théophile de Donder's initial and unsuccessful reinventions of Einstein's theory between 1916 and 1918. I also discuss how the war shaped opinions about Einstein and his theory among the Belgian public. In Belgium during the 1920s, as in France, Einstein's German nationality became a major topic of concern. The German war actions on Belgian territory led to post-war hostility towards Germany in Belgian science and society. As a result, Einstein and his theory were initially considered above all as *German*, and, because of this, either neglected or rejected.

Put in contrast to French counterparts, however, Belgian hostilities towards Einstein were more cautious and relativity short-lived. A possible explanation for this lies in the pervasiveness of internationalist ideals in Belgian science and society, even in the years after the war. I compare my conclusions to those brought forward by the myriad of other national case studies on the reception of relativity. This comparative perspective enables me to identify some transnational patterns in the impact of the Great War on Einstein and his theory's international rise to fame, including the war's effect on the shape of the international scientific networks through which relativistic physics circulated.