

Globalising Cartography? The International Map of the World, the International Geographical Union, and the United Nations

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Abstract Few maps mirror the history of the twentieth century as closely as the International Map of the World (IMW). A proposal for a map of the entire globe on a scale of 1:1 million, using standard conventions and symbols, was presented at the Fifth International Geographical Congress (IGC) in Berne in 1891 by the German geographer Albrecht Penck. Over two decades later, the final specification was finally published shortly before the outbreak of World War One, a crisis that brought a halt to the international collaboration on which the project depended. The IMW's fortunes waxed and waned over the next three decades, necessitating a major review of its continuing value after World War Two. A new IMW Executive Commission under the chairmanship of John Kirtland Wright, Director of the American Geographical Society (AGS), was established at the 1949 Lisbon conference of the International Geographical Union (IGU). Drawing on Wright's correspondence in the AGS archives, this paper examines the debates between the national cartographic agencies and related societies involved in this project about the future of the IMW, with particular reference to the transfer of the project's Central Bureau from the British Ordnance Survey in Southampton to the United Nations (UN) in New York in the early 1950s. This discussion, which focused mainly on the need to combine the IMW with an internationalised version of the US-dominated 1:1 million World Aeronautical Chart, reveals the on-going tensions between the ideals of scientific internationalism embodied in the IMW's original proposal and the harsh realities of national self-interest in the early years of the Cold War.

Key words: International Map of the World, global mapping, International Geographical Union, United Nations, J. K. Wright.

Introduction

The International Map of the World (IMW), otherwise known as the *Carte du Monde au Millionième*, had a prolonged gestation period and a protracted, inconclusive demise. The idea was first proposed by the German geographer Albrecht Penck at the Fifth International Geographical Congress (IGC) in Bern in 1891 (Figure 1). Penck's proposal envisaged a genuinely co-operative international map at the million scale, based on a common set of symbols and conventions. This would help resolve the bewildering complexity of the existing cartographic archive, the result of centuries of mutually antagonistic map-making by rival nations and empires. An IMW would have enormous scientific and educational value, Penck claimed, and would diminish the defensive territoriality on which existing cartography had previously been founded. It would create a new cartographic image of the whole earth at the dawn of a new century - a common map for a common humanity that would allow scientists and students alike to establish meaningful, world-wide comparisons for the first time.¹

Penck's vision was warmly received and a special committee established during the Bern Congress comprising twenty members from ten countries, including, alongside Penck himself, Ferdinand von Richthofen, Eduard Brückner, Alexander Supan, John Scott Keltie, Ernst G. Ravenstein, Franz Schrader and John Wesley Powell.² Penck recognized that if the IMW was to succeed, it would need to accommodate demands much wider than those expressed by an inherently more internationalist scientific community. Traditional geopolitical concerns and ambitions had also to be acknowledged. In an attempt to persuade his British colleagues, for example, that an international mapping project posed no threat to the imperial ideals that had previously shaped so much of their cartographic work around the world, Penck insisted that:

The circumstances and interests of our civilised life make good maps almost a necessity. Maps of our own country are absolutely indispensable; commercial interests, missionary undertakings, and colonial enterprise create a demand for maps of foreign countries, while of the maps required for educational purposes and as illustrations of contemporary history, the name is legion... A uniform map of the world would be at the same time a uniform map of the British Empire showing not only the actual territory under British authority, but also the sphere of British commercial activity, and would serve the varied purposes of administration, navigation, and commerce.³

Despite the best efforts of Penck and the IMW Commission, relatively few government authorities were ready to cooperate on an international map project and many refused to participate in any of the proposed meetings.⁴ The whole idea began to founder. Resolutions approved at the Sixth IGC in London in 1895 were rejected by French geographers at the Seventh IGC in Berlin on the grounds that Paris rather than Greenwich had been adopted as the prime meridian. Likewise, and in response, British geographers objected to the use of the metric system cherished by French map-makers.

While the geographers procrastinated, the official mapping agencies in Italy, France, Great Britain and Germany recognized the practical value of Penck's idea and began to prepare official map series of foreign territories at the million scale. The Survey of India commenced a new series on "India and adjacent countries" at 1:1 million scale in 1904. Whilst these new initiatives were clearly inspired by the IMW and demonstrated the value of the million scale, they also exposed the very national inconsistencies in map design that the IMW was intended to overcome (Figures 2 and 3).

Penck used these examples at the Eighth IGC in Washington DC to urge the US Government to produce a general 1:1 million map of the United States using a uniform set of symbols and conventional signs based on a polyconic projection with Greenwich as the prime meridian and the metre as the standard unit of measurement. Henry Gannett, the official Geographer at United States Geological Survey (USGS) was put in charge of the

preparatory work.⁵ The Ninth IGC in Geneva in 1908 received Gannett's recommendations for the standardization of the map with enthusiasm. Gannett had employed hypsometric colour tints for depicting relief, an increasingly popular method employed already by such organisations as the Survey of India on their million-scale mapping.

For seventeen years, congress succeeded congress and resolution succeeded resolution but very little was achieved towards the actual production of the map.⁶ Until the various governments and their official mapping agencies lent their practical support there would be little prospect of success. It was Charles Arden Close, chief of the Geographical Section of General Staff (GSGS) and later Director-General of the Ordnance Survey, who suggested to the IGC in Geneva in 1908 that the British government should be approached to organise an official conference in London to which government representatives would be invited.⁷ This was a particularly attractive proposition given that Britain and its overseas empire would necessarily contribute the largest share, approximately 25 per cent, of the proposed IMW sheets.

The First International Map Conference took place at the British Foreign Office on the 16 November 1909. Although guiding principles had been agreed at previous IGCs, Sir Charles Hardinge, the British Under-Secretary of State for Foreign Affairs, pointed out that up to this point these agreements "partook somewhat of the nature of pious aspirations".⁸ Representatives from Austria-Hungary, France, Germany, Italy, Russia, Spain and the United States hammered out a set of more precise resolutions that were finally adopted unanimously (Plate 1).

It was agreed that the IMW would use a simple polyconic projection at a scale of 1:1 million with Greenwich as the prime meridian.⁹ An ingenious and innovative global system of sheet numbering was also introduced with the metre adopted as the standard unit of measurement.¹⁰ Each sheet would cover six degrees of longitude and four degrees of latitude (Plate 2). Latin characters would be used on all official sheets. Countries could publish

sheets using alternative scripts for national editions but would be expected to publish the international sheet using Latin script.¹¹

Perhaps the key underlying principle of the IMW project was that sovereign states should prepare and publish map sheets solely of their own territories wherever possible. The IMW Committee would not recognize national sheets published by cartographic agencies, whether private or public, that mapped the territories of other states using IMW conventions, unless those states lacked adequate cartographic capacity of their own and had formally invited external mapping agencies to undertake this task on their behalf.

This principle became the Achilles heel of the project. Even during the deliberations at the Paris International Map Conference of 1913 prior to publication of the final specification, Russia and Japan contested the right to make million-scale sheets of China, leading Arthur Hinks, the combative Secretary of the Royal Geographical Society in London, to note:

a Chinese Secretary of Legation, to the admiration of all hearers, declared that he was authorized by his Government to announce that Geodetic and Topographical Services were now operating regularly in all the provinces of China. So there was nothing for Russia and Japan to do in the matter.¹²

While the IMW Committee were fully aware that parallel projects would make an important contribution to million-scale mapping, it could not endorse them for fear of alienating other contributing states.

The hard negotiations were now complete and at the Second International Map Conference in Paris in December 1913 delegates from 35 countries confirmed the final specifications and established a Central Bureau at the Ordnance Survey's Southampton headquarters to facilitate the exchange of information between the contributing national cartographic agencies (Plate 3).¹³ After 22 years of negotiation, the foundation was set for the most ambitious mapping project ever undertaken. However, it was a sad

irony that the outbreak of hostilities in August 1914 shattered these carefully constructed compromises.

The IMW from the 1920s to the 1940s

The major mapping agencies turned their attention to larger-scale map production during the First World War but the IMW survived in various guises. Around one hundred 1:1 million sheets were prepared at the Royal Geographical Society under the auspices of GSGS during the war.¹⁴ This simplified version of the IMW was selected as an approved map series for the post-war Peace Conference and its usefulness for several different national delegations strengthened the case for continuing the IMW after 1918.¹⁵ Many newly created countries established at the Paris Peace Conferences signed up to the IMW. Forty-four nations had committed themselves to the conventions by 1926, by which time more than 200 sheets had been published, though only a half were consistent with the 1913 resolutions and only 21 conformed exactly.¹⁶

Progress on the IMW between the wars was dictated by the economic, military and political interests of participating nation states. The mapping of Africa was largely divided up amongst the European colonial powers and progressed steadily, though with various levels of modification to the original specification. In Paris, the Service Géographique de l'Armée had prepared a series of its own 1:1 million European sheets during World War One and this new coverage was extended to the French colonies in North Africa after 1918.¹⁷ Due to the paucity of source material, the first edition of France's African series, published in 1924, carried the provisional title 'Croquis du Sahara et des Régions Limitrophes 1:1,000,000'. The series expanded through the late 1920s and 1930s to include Equatorial Africa and by 1939 consisted of 54 sheets under the revised, but still provisional title of 'Croquis du Sahara Français'.

Sheets conforming closely to the Paris conventions were published outside the auspices of the IMW. The Brazilian Club de Engenharia published a 50-sheet series in 1922 entitled 'Carta do Brazil' to celebrate the centenary of Brazilian independence.¹⁸ Based on the 1909 conventions, the series demonstrated the potential of million-scale mapping, even if unexplored areas were necessarily subject to the creativity of the cartographer's imagination. Countries took it upon themselves to extend million-scale mapping projects beyond the borders of their own sovereign territories. Germany, in a manoeuvre freighted with geopolitical significance, extended its coverage to include all German-speaking territories in Europe.¹⁹ The finest example of a million-scale mapping project informed by, but independent of, the IMW was undoubtedly the American Geographical Society's (AGS) 'Map of Hispanic America on the Millionth Scale', initiated by the Society's influential director Isaiah Bowman. When all 107 sheets were completed in 1945, it was rightly judged as an unsurpassed scientific and artistic achievement.²⁰

Even at this early stage, however, there were several notable absentees from the IMW project which had a major debilitating effect on IMW progress. Though the Tsarist government in Russia was originally a member, the Bolshevik authorities withdrew their support after the 1917 revolution.²¹ Furthermore, just four North American sheets had been published by the mid-1920s as a consequence of the virtual withdrawal of the United States from the IMW after 1913, despite the enthusiastic and practical assistance of several American cartographers during the early phase of the project.²² This reflected traditional isolationist American hostility to 'entangling alliances', as much of a concern in respect of scientific collaboration as it was for diplomatic relations. But American inactivity was also a consequence of the absence of a single co-ordinating civilian mapping agency that could meaningfully represent the United States within such a project.²³ Furthermore, the Geological Survey of the Department of the Interior and the Coast and Geodetic Survey of the Department of Commerce concentrated their energies on mapping at scales

larger than 1:1 million as more than five-eighths of the country had no topographic mapping. Elsewhere, an absence of accurate compilation material, technical resources, and (in some cases) political uncertainty meant that no significant progress had yet been made on sheets for north-east Asia, China, Australia, South Africa, Canada, and Polynesia (Plate 4).²⁴

The remarkable progress made by national agencies operating outside of the IMW strengthened the arguments of the IMW's critics such as Hinks who believed only the independent national agencies of the leading powers were capable of mapping the world as a whole:

The moral seems to be that if you want a general map covering a continent, consistent in style, and available in quantity, you must make it yourself, and whether you call it International or not is a matter of choice, or expediency, or perhaps of chance.²⁵

The spirit of international co-operation survived, however, in the idea to prepare a map series of the Roman Empire at the 1:1 million scale, first proposed at the 1928 IGC meeting in Cambridge (England) by O. G. S. Crawford, the Ordnance Survey's Archaeology Officer, a position created especially for him by Arden-Close. The International Map of the Roman Empire (officially entitled the 'Tabula Imperii Romani' from 1934) was specifically designed as a IMW-related project and aimed to publish a series of sheets showing Roman archaeological remains across Europe, North Africa and the Middle East. Crawford's objectives were partly political, shaped by strongly held Marxist convictions and his associated concerns about the manipulation and politicisation of Roman archaeology for nationalist purposes in fascist Italy and Nazi Germany.²⁶ In 1935, a conference at the Royal Geographical Society recommended that the IMW Central Bureau should assume a co-ordinating responsibility for the Map of the Roman Empire and re-confirmed the latter's status as an official IMW project (Figure 4). Further resolutions were also passed making the mapping agencies that had already committed to the production of IMW sheets responsible for the production of the relevant sheets of the Map of the Roman Empire within their national territories.²⁷ By 1935, eleven of the fifty

or so sheets had been published by Italy, Egypt, France and Great Britain, though momentum slowed, to Crawford's dismay, and only one further sheet was published by 1940.²⁸

The political tensions raised by IMW-related interwar and wartime mapping was also revealed by the ambitious project to produce a new 54-sheet 1:1 million atlas of Central Asia by the Swedish explorer Sven Hedin, based on new surveys conducted during the 1927-35 Sino-Swedish Expedition to Mongolia and Chinese Turkestan, a controversial undertaking involving almost forty scientists from six countries, including China, though the majority came from Sweden and Germany, the two countries that funded the expedition. This vast exercise, protected by more than 30 foot soldiers and transported by more than 300 camels, was described Hedin as a "travelling university" though it must have seem more like an invading army to the isolated communities through which it passed. Hedin's insistence that his proposed atlas, to be based on new survey rather than compiled from existing cartography, would be compliant with the IMW was intended to reinforce the impression that his expedition was a peaceful exercise in international scientific collaboration.

Although the expedition was conceived and mainly executed before the Nazis came to power, Hedin's pro-German leanings meant that the publication of its early findings were soon embroiled in the familiar propaganda battles that were already beginning to undermine relationships between German scientists and their colleagues in other countries. This was notably the case in relation to the first four sheets of Hedin's Central Asian atlas, all of which were published during the war in Germany by Hermann Haack's renowned team of cartographers at the Justus Perthes Geographische Anstalt in Gotha.²⁹ In the end, well over 50 volumes of new material were published based on the expedition's findings, including Hedin's atlas that finally appeared almost three decades later in 1966.³⁰ The long delay was caused by US Army Map Service (AMS) which confiscated Hedin's materials in 1945, aware of their enormous importance for the emerging Cold War confrontation with the Soviet Union, and only allowed

(and financed) the atlas when it was deemed no longer to have geostrategic significance.

As Hedin's experiences indicate, the spirit of internationalism that continued to adhere to the IMW was often abused by those for whom million-scale mapping projects had more traditional territorial and geopolitical objectives. During World War Two, IMW-based million-scale map sheets were increasingly used for planning military operations, precisely the opposite of what the original project was designed to achieve. The fixed sheet lines of the IMW and the increasing speed and mobility of warfare were major factors in the continued production of map series at the million-scale by military mapping agencies during the conflict. Million-scale series covering large tracts of the world were published by the Soviet Union, China, Great Britain, United States and Germany. Italy and Japan also published a limited number of such maps. The General Staff of the German Army before and during World War Two completed an extensive million-scale series called the 'Sonderausgabe', later titled 'Deutsche Heereskarte', which covered Europe, all of European Russia, parts of India, Africa south to the Congo, and the Near East.³¹

Although the Soviet Union had prepared some 1:1 million test sheets of its own territory as early as 1918, it was not until 1940 that the authorities in Moscow agreed to construct a new million-scale map of the entire country in 182 sheets, part of the Third Five Year Plan that was to be so rudely interrupted by the German invasion the following year. Despite the traumatic intervening events, the series was completed by 1946 and covered some 22.4 million square kilometres, the largest part of the world homogeneously mapped on the millionth scale, though the sheets remained classified.³²

The most extensive new 1:1 million series, however, was produced by the US AMS, in collaboration with GSGS in London. The AMS, established during World War Two, became one of the largest governmental mapping organizations in the world, perfectly capable of undertaking major

cartographic projects at all scales. After 1945, the joint AMS-GSGS 1:1 million series proceeded apace (as AMS 1301/GSGS 4646) and finally as a solo American enterprise (as AMS 1301), eventually covering most of Eurasia, Africa, and Australia. Between 1943 and 1948, the Bureau of Survey in the Chinese Ministry of National Defence compiled and printed a 1:1 million series based on the IMW format covering the whole of the national territory, though this too was never released (Figure 5).

Cold War Doubts

Despite the obvious appeal of million-scale mapping to the military mind, the future of the IMW in its pure form remained in serious doubt, especially during the immediate post-war period. Concern now focused on two specific themes: the role of the Central Bureau at the Ordnance Survey in Southampton and the growing global importance of aeronautical charts.

The annual reports of the Central Bureau of the IMW point to a growing frustration at the inability of the national agencies to adhere to the project's conventions.³³ By 1945, only 147 of the 974 sheets (15 per cent) required to cover the land areas of the world had been completed. Many of these required revision. The specification had not been strictly enforced. The impossibility of ensuring consistency in the depiction of relief across all parts of the world had already been acknowledged but even on sheets of Europe the sequences of contours and colouring adopted by different agencies were confusing and inconsistent. Similar problems of consistency had already been noted in the level of detail in respect of settlements, roads, railways and other communication routes.³⁴

Attention began to focus on the role of the Central Bureau at Southampton. It was a purely volunteer organization that had no powers to enforce international agreement. Its original role was simply to coordinate the work of the various contributing mapping agencies and record the progress made by the whole project.³⁵ The Bureau did provide feedback to any agency supplying proof copies of new editions and distributed the mandatory sixty copies that were to be sent to each contributor when a new

sheet was published. Procurement of IMW sheets had always been a problem as the Bureau had never assumed the role of agent for the sale of individual map sheets. Customers were advised to contact the publisher for the required sheet. The destruction of the Central Bureau's records due to bomb damage during World War Two was the final straw. The Ordnance Survey itself now questioned the value of maintaining the current arrangements and many within the organisation recognised that this might be an appropriate point for a review.

Perhaps the biggest threat to the IMW's future, however, was the growing global interest in aeronautical charts. During the interwar years, commercial aviation had become firmly established and by the outbreak of World War Two the first scheduled transatlantic flights had begun. Global and domestic airways already provided reliable and regular services.

Despite an intensifying demand, there was still an acute shortfall in aeronautical chart provision. Indeed, it had come as a shock to military chiefs at the outbreak of World War Two that procurement or compilation of aeronautical charts in the various theatres of war was severely hampered by a lack of adequate topographic mapping. A mere 10 per cent of the world's surface had been mapped to a sufficient standard and even this small percentage had not been adequately revised.³⁶ Though IMW sheets had previously been used as a base for aeronautical charts, they were increasingly seen as inadequate for this task. Human and technical cartographical resources were enlisted to meet the growing demand.

During the war, the US Coast and Geodetic Survey had commenced work on a new and ambitious series of aeronautical charts originally designated as the Western Hemisphere Aeronautical Chart, later to be expanded into the World Aeronautical Chart (WAC) at a scale of 1:1 million.³⁷ International agreement on an aeronautical chart specification followed in late 1944 when representatives of 54 nations gathered in Chicago for an International Civil Aviation Conference. The International Civil Aviation Organisation (ICAO) was later established in 1947 and became

responsible for the publication, maintenance, and distribution of the WAC which became known as the ICAO series.

The needs of aviators placed great pressure on cartographic agencies as member nations of ICAO were expected to keep charts falling within their national boundaries up to date. Indeed, the early ICAO sheets had already suffered from a “fixing or freezing of cartographic practice” which inevitably led to a rapidly accelerating obsolescence.³⁸ Frequent revision was clearly critical. Understandably, the WAC series took priority over the IMW for the vast majority of small-scale chart production undertaken by mapping agencies around the world.

The growing demand for WAC sheets and the similarity of the two specifications led to doubts as to whether the two series were necessary. However, there were important differences. The WAC had been specially devised to meet the requirements of visual navigation and carried only what was absolutely necessary for aviation and in a form particularly adapted to that objective. Therefore, only distinctive land, water and cultural features were shown. Its projection, the Lambert Conformal Conic, allowed the use of the uniform distance scale and showed radio ranges as straight courses. By comparison, the level of detail on the WAC was significantly lower than on the International Map and the polyconic projection of the latter did not possess the same special properties suited to air navigation. There were important differences in sheet lines. The sheet lines of the IMW were deliberately inflexible in order to provide a systematic coverage of the earth's landmass. Each sheet covered an area 4° of latitude by 6° of longitude. North of latitude 60° north, and south of latitude 60° south it was permissible to join two or more adjoining sheets of the same latitude band.

Most smaller countries, including Great Britain, France, Ireland and Finland, had publishing 1:1 million sheets that conformed to the IMW sheet lines alongside other sheets at the same scale that departed from IMW format to cover their sovereign territory more efficiently. In contrast, the recommended layout and numbering of sheets for the WAC was subject to

alterations as experience might require and as agreed as the series progressed. In comparison to the IMW, the WAC was an altogether more modern, flexible product, designed to be ‘fit-for-purpose’ with its clearly defined purpose (Figure 6).

In the face of competition from the WAC, it might have been expected that the IMW would simply fizzle out and several commentators wondered whether a single global map made any sense in such brutally divided world. However, there was a glimmer of hope. The newly-formed United Nations, mindful of the IMW’s rather utopian internationalist origins, favoured continuing the project. The authority exercised by the UN, combined with the potential coordinating role of its new Cartographic Office, added weight to the argument that the Central Bureau of the IMW should be transferred to the UN. International attention could then focus on the long delayed completion of the IMW. However, any transfer of the IMW to the UN would have to be sanctioned by the International Geographical Union (IGU), the IGC’s successor organisation that was itself in a state of post-war disarray.

Locating the IMW

Although the IMW was never officially an IGU project, the project was closely associated with the IGC, the IGU’s precursor organisation, to which Penck had made his stirring original proposal in 1891. As we have noted, IMW progress reports were presented at all subsequent IGC events through the opening years of the 20th century and a statement would no doubt have been made to the proposed 1942 IGC in Lisbon had it not been cancelled due to World War Two. After 1945, the IGU attempted to revive international scientific relations, despite the problems of international travel and exchange of correspondence between executive committee members, some of whom had “disappeared”, and a new IMW Executive Commission was duly established within the IGU charged with reporting on progress at the delayed conference in Lisbon and in steering the project forward in the future.³⁹

American geographers had a particular interest in this delayed event, a point that would later become significant in the story of the IMW. The American IGU National Committee, chaired by George B. Cressey, a prominent geographer from Syracuse University, was preparing an invitation to host the next IGU conference (the seventeenth in the former IGC series) in Washington DC in 1952. As Cressey wrote:

it is clear that considerable initiative is now needed in order to reactivate Union affairs, notably with respect to the Commissions. Since it is also reasonably certain that the 1952 Congress will come to the United States, we must start plans in the near future.⁴⁰

The fact that 1952 also marked the 100th anniversary of the AGS provided additional incentive for an US-hosted conference as it was hoped that delegates from around the world would help to mark the older society's centenary. The US National Committee would be the co-ordinating agency, with the Association of American Geographers (AAG) and the American Geographical Society (AGS) also heavily involved.⁴¹

American geographers were encouraged by the IGU to suggest new commissions. John Kirtland Wright, the AGS's scholarly Director, became a central figure in the ensuing deliberations (Figure 7).⁴² Wright enthusiastically supported the suggestion first proposed by Edward Espenshade from Northwestern University that the ailing IMW programme should be reviewed under American guidance.⁴³ Wright suggested four new IGU commissions, one of which would be devoted to the IMW.⁴⁴ By late September 1948, however, he was beginning to change his mind: "I am not sure whether a Commission on the Millionth Map should be proposed. As an international project the Millionth Map is in a parlous state. The headquarters at Southampton were bombed out and all the records destroyed".⁴⁵

Despite Wright's growing doubts, the US National Committee eventually proposed six new Commissions, listed in its Annual Report of 31 March 1949, one of which was indeed devoted to the IMW. Given the less than

enthusiastic contribution of the United States to the IMW project prior to World War Two, it must have come as a surprise to some European cartographers that the American geographical establishment was belatedly taking an interest in this most overtly internationalist of geographical projects, one that had previously seemed alien to the American isolationist sensibilities. While such beliefs were self-evidently in decline in the changed post-war circumstances, there is little evidence in Wright's correspondence to suggest that the cerebral geographer was seeking to secure the future of the IMW, still less to ensure that the United States would take on a leading role in the project in the future.

As planned, the new IGU Executive Commission on the IMW was formally constituted at the Seventh Assembly of the IGU (the sixteenth in the former IGC series) Lisbon in the second week of April 1949. Wright was nominated and agreed to chair the Executive Commission, assisted by Geoffrey Cheetham, Director-General of the Ordnance Survey, and Leite de Castro, a geographer from University of Rio de Janeiro. By the time Wright's appointment was officially confirmed by George Kimble, the IGU Secretary, in June 1949, Cheetham had been succeeded at the Ordnance Survey by the redoubtable Reginald Llewellyn Brown. The idea prominent American geographer might now be able to steer the IMW in a new direction, one that was perhaps more palatable to the interests of the United States, was immediately challenged by the bombastic Brown who effectively took control of the Commission. The forthright tone of Brown's letters to Wright suggests that he had a clear agenda which he intended to fulfil with as little fuss and delay as humanly possible with or without his chair's support.⁴⁶

Brown made several observations about the composition of the Commission, recommending that "if there are to be six official members and six corresponding members, it would seem to me that the six official members should be men of a wide outlook, while the corresponding members should be those concerned with particular aspects of the 1/M map".⁴⁷ Brown was especially keen that France should be prominently represented on the Commission, no doubt anxious to reinforce a more

traditional European perspective: “the French have played an important part in the production of the International 1/M Map”, he informed Wright, “so I would like to suggest that Monsieur Louis Hurault, the Director of the French Institut Geographique National, be invited to become an official member”.⁴⁸ Wright duly agreed Hurault was immediately appointed alongside F. J. Alcock (Chief Curator of the National Museum of Canada in Ottawa) as corresponding members. Two other Europeans, Henri Gaussen from the University of Toulouse and Ronald Miller from the University of Edinburgh, were added further to reinforce the Commission’s ‘old world’ composition.

No terms of reference had been laid down and Brown was equally determined to anxious to rectify this situation as “without these we are liable to grope in the dark”.⁴⁹ His suggestions were again agreed by a compliant Wright and subsequently approved by the IGU Executive Committee. The Commission was to:

1. Consider comprehensively the problem of the International Map of the World, 1,000,000
2. In particular:
 - a) To consider what changes, if any should be made in the Central Bureau of the I.M.W.
 - b) To consider and advise whether the absorption or integration of the Central Bureau would be advantageous in the light of the following Resolution adopted by the Economic and Social Council of the United Nations on 27th July 1949, under Item 45, Coordination of Cartographic Services of Specialized Agencies and International Organizations: Having noted that a number of States have expressed views in favour of the absorption or integration of the Central Bureau, International 1/M Map of the World, into the United Nations, requests the Secretary-General to examine the possibility of such absorption or integration in the light of the Council’s decision on the co-ordination of cartographic services.
 - c) To ascertain what coverage at the 1/M scale exists or is in course of preparation, and to advise whether duplication of effort, if any, can be

advantageously reduced. Particular reference should be made to the I.C.A.O. 1/M aeronautical charts;

- d) To review the present procedure whereby each nation produces, to a generally agreed specification, the sheets covering a specific area, and to recommend whether or not any change in this procedure is worthy of further investigation;
- e) To reappraise the purposes for which the I.M.W. was originally created and to ascertain how far the present specification, including sheet layout, meets modern requirements, and particularly whether a base map suitable for carrying geographical overprints can satisfactorily be printed from the various existing plates;
- f) To ascertain how far the ICAO aeronautical 1/M charts can meet the purposes for which the IMW is produced and vice versa, and whether any coordination between the two maps could be affected with advantage.

Brown made no secret of his objectives which were to ensure the speedy and efficient transfer of the IMW Central Bureau from the Ordnance Survey to the United Nations (UN), an organisation seemingly tailor-made for this project. At the opening session of the UN General Assembly in London in 1946, the national flags present at the League of Nations were replaced by a new flag of hope, described at the time as “a novel aerial projection of the world spread out from the North Pole, in gold and encircled with olive branches”.⁵⁰ The UN Economic and Social Council (ECOSOC) was established at the same event to co-ordinate the reconstruction of war devastated economies and infrastructures devastated. The ECOSOC’s Coordination Committee, created shortly afterwards, was designed to prevent the duplication and dispersion of effort among all types of intergovernmental organisations and had explicated including cartography within its brief.⁵¹

Although Brown was keen to ensure the IMW transfer to the UN, not least to reduce the administrative strain the project placed on his overstretched organisation, he was also determined to protect the role of national mapping agencies in the wider project, particularly those based in Europe. The idea that the UN might eventually control the project, in

defiance of national mapping agencies, was decidedly not on Brown's agenda. "[T]he existing bureau should not be handed over to some specialised agency of the United Nations", he insisted, for "[o]ur object is to provide a single map series for many different purposes and to avoid duplication of effort. For this reason alone it seems that the UN should undertake the functions of the Bureau rather than a specialised agency, such as UNESCO, which will have in view only its own specialised needs".⁵²

In early September 1951, the ECOSOC Committee recommended that the IMW Central Bureau be located within the newly established UN Cartographic Office, though the independent role of national mapping agencies was explicitly recognised and these agencies were encouraged to submit recommendations on the most appropriate means to ensure the completion of the IMW. The recommendation was passed unanimously by the ECOSOC council on 20th September 1951.

Brown did not think that the adoption of the resolution would make the IGU Executive Commission redundant or that it would materially alter its duties. The Commission would no doubt expect advice on the attitude it should take concerning the absorption of the Central Bureau into the United Nations. Brown redrafted item 2(b) of the terms of reference to reflect this change.

Brown wrote to Wright enclosing a personal copy of the circular letter he had sent as president of the Central Bureau to all those countries that had from time to time subscribed to the IMW inviting comment on the transfer of the Central Bureau to the UN.⁵³ Responses from mapping agencies from all countries were unanimous and best summed up by the Geographer in Chief of the Belgian Congo who wrote:

Without being critical of what was done in the past, I think the problem demonstrates the need for the better coordination of global mapping. We are of the view that it would be beneficial to entrust this kind of problem in future with the United Nations and a first step in the implementation of this idea would be to nest, as it was proposed, the Central Bureau of

the International Map at 1: 1 million scale to the mapping services of the United Nations.⁵⁴

The future of the IMW now seemed secure with the UN. However, the Commission had overlooked the ‘Tabula Imperii Romani’. Laurence Kirwan, Secretary of the Royal Geographical Society, wrote to Wright in May 1952 expressing concern over the transfer of the Central Bureau and its responsibilities for the ‘Tabula’ to an organisation that had had no previous involvement in project.⁵⁵ This problem was left unresolved until after the final report was published.

The IMW and the World Aeronautical Chart (WAC)

The relationship between the IMW and the WAC was a key part of the IGU Commission’s terms of reference. The inevitable transfer of the Central Bureau to the UN, an organisation that counted the ICAO as one of its family members, brought this issue into even sharper focus. Leite de Castro was to have drafted a letter to adhering countries requesting views on the relationship between the IMW and WAC, but he failed to do so and Brown and Wright were obliged to make these inquiries themselves.⁵⁶ Wright decided to approach the main mapping authorities rather than government ministries as originally suggested by Brown. Wright argued that the only way that replies would be expected from the latter would be if the enquiries were sent through the US State Department and “this might make the procedure appear as an enterprise of the United States government which might in turn be somewhat prejudicial at this time”.⁵⁷

Wright’s letter referred specifically to the requirement of the Commission to explore the relationship of the two world map series and to what extent the WAC could meet the purposes of the IMW and vice versa. He provided an appendix summarising the differences between the two series in terms of projection, sheet lines, conventional signs and compilation materials. On Brown’s insistence, he also provided a clear steer that the Commission hoped to recommend that both series should be retained as separate but related projects. Brown is not optimistic that a unanimous

response would be forthcoming: “I trust you will have quick and satisfactory replies and that by some miracle they will all say the same thing”.⁵⁸

The miracle did not materialise as opinion on the future relationship of the IMW to the WAC was sharply divided. On the one hand, longstanding and relatively productive contributors such as Britain, France, Norway, Sweden, Finland, and India readily agreed that it was necessary to retain both the IMW and the WAC. The cost of standardising the two series in terms of symbols and projection was simply too expensive for what little benefit it would ensue. On the other hand Canada, the United States and South Africa, countries that had severely lagged behind in terms of IMW map production and had invested heavily in WAC production, questioned the wisdom of continuing with two entirely independent products.

By 1950, just three IMW sheets had been published by the Canadians and even these were in need of substantial revision. The Director of the Surveys and Mapping Branch for the Canadian Department of Mines and Resources, William H. Miller, was forthright in his response to Wright’s inquiry, perhaps revealing a degree of sensitivity on the subject. On the subject of compilation, he complained:

whoever wrote this section has entirely lost sight of the fact that the production of the maps in their territory is the responsibility of the various sovereign states. It is entirely within the discretion of the adhering countries to decide whether any production will be undertaken and what sheets will be done first. Any discussion of the agencies undertaking the work within a country or the statement that ‘the priorities for the production of the sheets is not the same’, is out of place.

In a marginal ‘note to self’ at this point in Miller’s response, Wright perfectly captured the essence of Miller’s message: “mind our own business!”. Miller’s response continued:

Our view is very definite on the subject for the reason that we do not see much chance of Canada participating in the production of two entirely

distinct series of maps at a scale of 1/1,000,000 where differences in projection, sheet lines, etc., would involve two separate compilations. We are definitely committed to the ICAO series, and have made considerable progress toward complete coverage. We are preparing to produce a series of ground maps at 1/1,000,000 scale, using as much as possible of the material prepared for the air charts.⁵⁹

On the need for two separate series, the Canadians agreed that two series were essential in populated areas and advisable in all areas. However, there seemed no reason why the maps could not be so designed that one compilation would answer both purposes. This was of particular interest to Canada, as the majority of the sheets covered unpopulated areas where there would be relatively few differences between the two series. On the subject of sheet lines, it was agreed that in theory it was not essential to relate the sheet layouts of the two series. But from a practical point of view the Canadians saw little prospect of them participating in the production of an IMW series for a long time unless they were related. The WAC projection was not viewed as so unsuitable for the IMW and there were severe doubts as to whether it mattered anyway as it was mostly a 'theoretical issue'. According to Miller:

The amount of work involved in interchanging material between the two projections would be more than we could undertake for the foreseeable future.⁶⁰

The United States had agreed to the original resolutions adopted by the IGC in 1908 and the USGS was responsible for 42 sheets designed to cover continental United States. By 1950 only nine of the sheets had been published. Thomas S. Nolan, Acting Director of the USGS, pointed out that US military agencies had formally adopted a 1:1 million scale layout for the WAC series in respect of all Department of the Army Maps of that scale.⁶¹ In view of this, and mindful that a complete national coverage was now provided by the WAC, Nolan openly questioned the necessity of the IMW series. The USGS was re-examining the justification for continuing the "small program" of compiling the IMW maps of the United States, Nolan

observed, and the programme had been suspended pending increased demand for the IMW series.

It had appeared that many government requirements for 1/1,000,000 scale geographical maps might possibly be met by the World Aeronautical Charts which, for the past several years, have afforded complete and reasonably up-to-date coverage. As these are maintained at government expense, we have felt that the question of also continuing the IMW series should be rather carefully considered. Judging from our IMW map sales, and other very general indications, the demand for these maps in recent years has been rather limited except for the military uses. Of course it is recognised that this would probably be otherwise if a complete and maintained series, such as the WAC now affords, were available.⁶²

In these circumstances, USGS was happy that the IGU Commission had recommended the need for the two series as set out in the appendix to their letter as this “dispelled some of our misgivings concerning the justifications for continuing the compilation and printing of the IMW sheets of United States.” However, no future commitment to IMW production was provided.

As South Africa had maintained million-scale aeronautical charts covering the whole of Africa south of latitude 19° 20 minutes in seven sheets, revised as recently as 1948-49, and boasted a 22-sheet 1:500,000 topographical map series covering the entire country which had been published between 1947 and 1951, the Union’s Department of External Affairs provided a firm response to Wright’s enquiry:

The views of the government of the Union of South Africa are that, in southern Africa, the production of two 1/1M series is quite unnecessary. The Union government is of the opinion that the sheet lines and projection of the WAC series should be adopted for both series.⁶³

The South Africans also provided a practical solution where symbols of both series could be brought more nearly into line. In areas where both series may be necessary, IMW production could easily be created through

conversion of the WAC series through the omission of the aeronautical symbol plate, the addition of a black plate for further names in detail, and the substitution of another road plate. Indeed the South African opinion was that “the conclusions noted in the Appendix to your letter are, in most cases, not acceptable.” On the subject of sheet lines, opinion was also quite clear.

Seeing that the IMW sheet lines consist of meridians and parallels set out in 6° by 4° intervals starting from the intersection of the Greenwich Meridian with the Equator and entirely disregarding the shape of the land masses, it cannot be agreed that the WAC layout ‘would be detrimental to the general uses of the geographical map’... Both the IMW and the WAC sheet lines are unsuited to air navigation in southern Africa. Any international series generally suits the world after a fashion and does not necessarily suit any particular country. The WAC sheet lines endeavour to minimise the number of sheets required but, by the universal law of sheer cussedness, they lie as unfavourably relative to the national air routes as possible and produce the maximum number of cases where three or four sheets join on an air route.

Where sheet lines were concerned, both IMW and WAC suited the countries of the world equally well or equally badly. If the two series were on the same sheet lines and projection, and if a genuine effort were made to bring the symbols into line, it would be possible to convert WAC to IMW in areas where both series may be necessary.

Australia had published just nine IMW sheets, most of which required considerable revision. B. P. Lambert, the Australian Deputy Director of National Mapping, shared the misgivings of his Americans, Canadians and South African colleagues. Much effort had been invested in the production of aeronautical charts even prior to the establishment of the WAC series and he viewed the future of the IMW with some scepticism. Lambert summarised his reservations as follows: “It is thought that whilst there exists a definite need for the International Map of the World, the demand will be reduced

considerably when sheets of the World Aeronautical Chart ICAO 1:1,000,000 become available".⁶⁴

Even those countries that wished to maintain the WAC and IMW as separate series felt that improvements could be made to the IMW sheet lines. Several countries, such as Great Britain, Finland, Sweden, New Zealand and Norway had found it necessary to publish sheets in the IMW style but on special sheet lines in view of the inappropriate incidence of the standard sheet lines in their area of responsibility. Colonel N. MacNeill, the Assistant Director of the Ordnance Survey of Ireland, complained that a comparatively small country such as Ireland should be able to secure agreement to show the whole of its national territory on a single sheet. MacNeill pointed out that the ICAO Map Division had agreed to a re-alignment of the sheet lines for the Irish WAC sheet.⁶⁵

Though a standard sheet size was essential, the Ordnance Survey also felt that it was important to have some flexibility in dealing with special cases and depart from the standard size by adding extensions or introducing overlaps in cases where this would improve the layout of the sheets. The Ordnance Survey suggested that an improvement in the sheet layout in certain areas would add considerable incentive to the production of maps in that area and Great Britain was a case in point.⁶⁶ Future publication of standard IMW sheets by the Ordnance Survey was prevented for the foreseeable future by the destruction of all the reprographic materials during World War Two.⁶⁷ However, the materials for Sheets 1 and 2 of the million-scale map of Britain with specially design sheet lines had survived.⁶⁸

Nor were respondents altogether happy with the original specification of 1913. The Surveyor General of Egypt took the opportunity to criticise the method of relief depiction, complaining in particular about the use of the colour green in depicting altitude. Although this colour was often used to represent low lying areas, it was "invariably associated with fertile cultivation or natural growth" and its use in maps of Egypt and many other arid areas "created an erroneous impression".⁶⁹ On the other hand, the

Survey of India was adamant that its specification and use of hypsometric tints and contours should be adopted by the IMW. This was not presented in the spirit of improving the specification but simply as a far preferable system which would save the Survey the cost of preparing new plates for the IMW.⁷⁰

Though official USGS contributions had been disappointingly slow, the US AMS million-scale aeronautical chart production had made an impact on the mapping of Central America. For example, Guatemalan involvement in the project was made redundant due to the AMS providing million-scale aeronautical charts using trimetrogon photography. To many smaller Central American countries, the IMW was an irrelevance.

Responses from many other countries were brief but clear. The Danes had suspended work in its IMW sheets of Iceland and Greenland, pending the outcome of deliberations regarding the future of the ICAO series and the IMW. The Finns were similarly non-committal, describing their IMW sheets as “antiquated”. The Director General, Väinö Seppälä, stated that “it would be very unwise for us to re-edit our sheets before a definite new program on United Nations lines has been generally accepted”. He echoed many by writing that “the whole project is open to international discussion”.⁷¹

Final Judgements

Clearly there was considerable difference of opinion on the questions of sheet lines, projections, conventional signs and particularly on the need for a separate series. Though the responses were, without exception, driven by self-interest, Wright began his summary of the replies by pointing out that at least “not a single one has advocated abandoning the IMW”.⁷²

Brown admitted the only thing the IGU Commission could do in its final report was:

repeat the substance of the final paragraph of your Third Report. Short of laying down the law ourselves, which I think would be difficult and would almost certainly be unacceptable, that is about all we can usefully do. If the suggested conference were to be held the representatives of

each nation would then have a fairly good idea of the points of view held by other nations and the conference should have some chance of reaching agreement.⁷³

Wright duly wrote a draft report which he enclosed with his letter of 10 April 1952. Brown was unimpressed "I am not at all happy about this report", he wrote:

[it] leaves me with the impression that the Commission did practically nothing, whereas in fact we really did a great deal though we have not by any means solved the problems that were set in the terms of reference.⁷⁴

Brown reminded Wright that he had sent a paper on each of the items 2(a), 2(b), and 2(d) of the original terms of reference and that Hurault had also communicated his views in a paper on item 2 (e). As these papers had been circulated to the Commission, Brown worried that Wright was ignoring important evidence of progress. He also objected to Wright's statement that "items 2(a) and (b) were treated primarily by Gen. Brown" as every member of the Commission had seen and many had commented on these papers. He suggested that the report should state the Commission's conclusions rather than infer that they were those of a particular individual.

Brown also recommended that Wright should include, as an appendix, the paper he had previously written to help Wright with his enquiry about the relationship of the IMW to the WAC, continuing that:

it is, of course, clear to us that we have not been able to answer the questions posed in the terms of reference. This I believe to be due partly to the differences within the Commission itself, which are perhaps not very severe, but more particularly to the great differences of opinion among the various nations who are interested in IMW as revealed in the replies to Enquiries I and II. I think we ought to say more categorically that that is a reason for not providing answers to the questions and that that also is our reason for recommending an international conference be called.

As to the future of the Commission, Brown agreed that the Commission had done all it usefully could do and “that we do not recommend its continuance.” He further suggested that the report should be worded so as to recommend further consideration be given to these problems after the Central Bureau was transferred to the UN.

Brown disagreed with the remarks regarding the financing of the project proposed by Hurault. As far as Brown was concerned, the IMW was a co-operative undertaking and the Central Bureau had no technical or administrative functions and was certainly not concerned with financing the project. In his opinion:

if those countries whose territorial and financial positions make the undertaking difficult for them are financed by the others, it will soon lose its cooperative nature and may also lose its international character." Brown preferred that the Commission ought to draw attention to the need to investigate the financing of the map and recommend that the countries be invited to send representatives to a proposed conference to consider the problem of financing the IMW.

In conclusion, Brown noted that:

I am afraid you may think I have done some violence to the draft report which I am sure you must have taken a lot of trouble to compile but in its present form I would not feel at all happy for it to be presented to I.G.U. It certainly reveals the fact that we have not provided the answers that the terms of reference had asked for, and while this is quite true, it has done so nakedly as to make it also appear that the Commission has given no thought to the matter at all. This is far from being the fact.

Wright dutifully redrafted the report in response to Brown’s forthright criticisms. In a letter of 4 June 1952, Brown thanked Wright for his efforts: “I’m so glad you have taken my comments on your original draft in the spirit in which they were intended and that you have made such a good job of redrafting the report. I am very sorry to have thrown this extra work on you just at a time when you were so heavily engaged with the celebration of the 100th anniversary of the AGS. I hope that all went off well.” On the issue of

whether to include all the appendices Brown now felt that the “report as now drafted it is perfectly readable without them.”

By November 1951, Wright felt that the Commission had done all it could. “We have made a reconnaissance, and arrived at certain general conclusions that I believe are of value, but I don’t see how we can pursue the matter further regarding points of technical detail. These will have to be ironed out much more carefully at a meeting of representatives of the agencies concerned.”⁷⁵ Wright was unable to present the report to the IGU meeting at the Statler Hotel, Washington on 11 August 1952 due to illness, and Brown, no doubt relishing the opportunity, presided over the proceedings in his absence. The Commission recommended no change to the present system whereby each nation was responsible for the production of maps covering its own territory, and conforming generally to the specifications as laid down in 1913. The Commission also recommended that both the IMW and the WAC should be retained as necessary and mutually sustaining programmes. However, the wide differences of opinion within the international community on technical and other matters had convinced the Commission that the IMW’s many problems could only be resolved by personal, face-to-face discussion between representatives of interested governments under the auspices of the Economic and Social Council of the United Nations.

In the end, this decision had little impact on the IMW which was already a relatively moribund project, its fate sealed by the very national rivalries and suspicions it was designed to diminish. Just as Penck’s utopian internationalism had to be tempered by the realities of negotiating with official mapping agencies, so Wright had confronted the harsh realities of dealing with hard-pressed post-war professional map makers operating within the context of an emerging Cold War ideological division of the globe.

Eventually, a UN Technical Conference was organised in Bonn in August 1962 to revitalise the IMW. An impressive exhibition on the history of the project was organised,⁷⁶ as well as the publication of a detailed

bibliography.⁷⁷ The conference agreed to amend the specifications in various ways, notably in relation to relief depiction and symbols, and to adopt the Lambert conformal conic projection in compliance with the World Aeronautical Chart.⁷⁸ The annual reports on the IMW, published through the remainder of the 1960s by the UN's Department of Technical Cooperation for Development, bear witness to the resolute efforts made to continue the project including further revision of the relief depiction.⁷⁹

The IMW's many critics remained unimpressed. The renowned American cartographer Arthur Robinson described the IMW as no more than 'cartographic wallpaper'.⁸⁰ Only a handful of new editions were released through the early 1970s, with the result that the IMW could no longer be regarded as an active international series. In 1989, a UNESCO report concluded that continuation of the IMW was no longer worthwhile as most nation states had long since ceased production under this programme.⁸¹

Conclusion

Reading through the responses to the IGU Commission one senses the reluctance on the part of all IMW contributors to throw in the towel and admit defeat. Perhaps there is an element of denial or even sentimental attachment to it. To unilaterally withdraw from the project would represent abandonment of post-war rapprochement and what remained of the utopian ideals of the International Map.

The twentieth century got the International Map it deserved. Foreign policy, dominated by self-interest, had an overriding impact on the project. This was inevitable given its over-reliance on national mapping agencies that were so inextricably tied to foreign policy. For example, just as the virtual withdrawal of the United States from the project during the inter-war period mirrored its attitude to the League of Nations, its post-war revival of interest in the IGU and the IMW paralleled its central role in support for the UN. Similarly, the end of European empires, arguably the most revolutionary change in world politics after 1945, had an enormous impact on the project.⁸² The colonialism to which Penck had appealed during its formative

years had been replaced by a new world order. Britain, so central to the original negotiations, now wished to relinquish its administrative responsibilities. If the IMW was to survive then its future would be more secure within the auspices of the UN. Fortunately for the IMW, the UN recognised the symbolic and practical importance of the project.⁸³

Blame for the failings of the IMW should not rest solely with national mapping agencies and their governments. Rivalries, jealousies and other human failings contributed too, as illustrated by the trials and tribulations of the 'Tabula Imperii Romani'. To supporters of the International Map, the 'Tabula' exemplified all that was good about the IMW – an ideal topographic base for new academic research, designed quite explicitly to ensure that the classical world remained an inspirational scholarly resource for all countries, not just those who were best able by location or resources to control the creation of archaeological knowledge. In his review of two new sheets published in 1954, the programme's idealistic champion, O. G. S. Crawford, could not conceal his bitter disappointment. In his view, the project in its original form was now "completely and irrevocably dead".⁸⁴ Among the causes of death were the "absurd national jealousies" that prevented archaeologists in one country from collaborating with those of another and the general "cartographical ignorance of the archaeologists and the apathy of them and their Survey Departments" which meant that "no field-work had been done; it was all armchair work."⁸⁵ Crawford's characteristically forthright criticisms reveal another underlying weakness of the IMW and its associated projects. If the IMW was to serve as a base map for academic research, it needed contributors that political motivations, intellectual energy and technical skills that Crawford possessed. It would appear he was in a very small minority indeed. Given the evidence presented above, Norman Thrower's comment that "through all the vicissitudes of the twentieth century, the IMW has been a vehicle for international cooperation, if not an unqualified cartographic success" is perhaps a little generous.⁸⁶

¹ Albrecht Penck, 'Die Herstellung einer einheitlichen Erdkarte em Maßstabe von 1:1,000,000', *Compte Rendu du Vème Congrès International des Sciences Géographiques tenu à Berne du 10 au 14 août 1891* (Berne, Schmid, Francke, 1892), 191–8. See also Albrecht Penck, 'Construction of a map of the world on a scale of 1:1 million', *Geographical Journal* 1 (1893): 253–61. For more on Penck, see Emil Meynen, 'Albrecht Penck, 1858–1945', vol. 7 *Geographers: Bibliographical Studies*, vol. 7, ed. T. W. Freeman (London, Mansell, 1983), 101–8; and Michael Heffernan, 'Professor Penck's bluff: geography, espionage and hysteria in World War One', *Scottish Geographical Journal* 116 (2000): 267–82.

² Ferdinand von Richthofen (1833–1905) was Penck's predecessor as professor of geography at the University of Berlin, while Eduard Brückner (1862–1927) and Alexander Supan (1847–1920), the latter editor of *Petermanns Geographische Mitteilungen*, were both, like Penck, leading physical geographers renowned for their pioneering research on glaciation and global climate change. John Scott Keltie (1840–1927) was Secretary of the Royal Geographical Society and Ernst Ravenstein (1834–1913) was an internationally renowned German-born cartographer and a prominent Fellow in the same organization. Franz Schrader (1844–1924), France's leading atlas compiler, was a senior member of the Paris Geographical Society. John Wesley Powell (1834–1902), the legendary explorer of the American West, was director of both the US Geological Survey (USGS) and the Smithsonian Institution's Bureau of Ethnology. For biographical details on some of these individuals, see A. Kolb, 'Ferdinand Freiherr von Richthofen, 1833–1905', in Freeman, *Geographers* (note 5), 7: 109–15; the opening chapter by the editors in *Eduard Brückner: The Sources and Consequences of Climate Change and Climate Variability in Historical Times*, ed. Nico Stehr and Hans von Storch (Dordrecht, Kluwer Academic, 2000); L. J. Jay, 'John Scott Keltie, 1840–1927', in *Geographers: Bio-Bibliographical Studies*, vol. 10, ed. T. W. Freeman (London, Mansell, 1986), 93–8; David Grigg, 'Ernst Georg Ravenstein, 1834–1913', in *Geographers: Bio-Bibliographical Studies*, vol. 1, ed. T. W. Freeman, M. Oughton and P. Pinchemel (London, Mansell, 1977), 79–88; David Grigg, 'E. G. Ravenstein and the "laws of migration"', *Journal of Historical Geography* 3 (1977): 41–54; Numa Broc, 'Franz Schrader, 1844–1924', in Freeman, *Geographers* (op.cit.), 1: 101–8; Scott Kirsch, 'John Wesley Powell and the mapping of the Colorado plateau, 1869–1879: survey, science, geographical solutions, and the economy of environmental values', *Annals of the Association of American Geographers* 92 (2002): 548–72; and Donald Worster, *A River Running West: The Life of John Wesley Powell* (Oxford, Oxford University Press, 2001).

³ Albrecht Penck, 'Construction of a map of the world', 254.

⁴ Emil Meynen, *Carte Internationale du Monde au Millionième (International Map of the World on the Millionth Scale)* (Bonn: Bundesanstalt für Landeskunde und Raumforschung, 1962).

⁵ Henry Gannett, 'The Map of the United States on a scale of 1:1,000,000', *Bulletin of the American Geographical Society* 37 (1905): 730-2.

⁶ Alastair W. Pearson, D. R. Fraser Taylor, Karen D. Kline, and Michael Heffernan, 'Cartographic ideals and geopolitical realities: international maps of the world from the 1890s to the present', *Canadian Geographer* 50 (2006): 149-76. See also Marie-Claire Robic 'Les vœux des premiers Congrès: dresser la Carte du Monde', in *Géographes Face au Monde: l'Union Géographique Internationale et les Congrès Internationaux de Géographie*, ed. Marie-Claire Robic, Anne-Marie Briend and Mechthild Rössler (Paris, L'Harmattan, 1996), 149-78. Resolutions on the IMW by Penck, Schrader and others appear in the volumes of IGC reports for London (pub. 1904), 365-79; Berlin (pub. 1901), 1: 203-29 and 2: 65-71; Washington DC (pub. 1904), 95-102, 104-7, and 553-70; and Geneva (pub. 1908), 1: 331-5, 338-400 and 2: 52-3.

⁷ For an illuminating first-hand account of these early negotiations, see Charles Arden-Close, *Geographical By-Ways and Some Other Geographical Essays* (London, Arnold, 1947). Arden-Close was Director-General of the Ordnance Survey from 1911 to 1922.

⁸ Arden-Close, *Geographical By-Ways* (see note 7), 113.

⁹ The polyconic projection was first devised by Ferdinand Hassler in 1820. Straight central meridians were true to scale for each sheet, with degrees of longitude marked off on the limiting parallels again in their true lengths to scale. These points were joined by straight lines to represent each meridian. The range of error within any given sheet was reduced by shrinking the length of the central meridian by 0.06 so that the meridians two degrees to the east and west of it would be true to scale. The projection was therefore neither conformal nor equivalent but exhibited the characteristics of both, so that the scale error was less than 1 per cent at any point within 560 miles of the central meridian on any given sheet. For further detail see Anon., 'The projection for the International Map of the World', *Geographical Journal*, 39(5) (1912): 468-9 and Arthur R. Hinks, 'The map on the scale 1/1,000,000, compiled at the Royal Geographical Society under the direction of the General Staff, 1914-1915', *Geographical Journal* 46 (1915): 24-50.

¹⁰ The sheet numbering system was an enduring legacy of the IMW. It consisted of 4° wide latitudinal zones for the whole earth numbered away from the equator with letters 'A' to 'O'. These letters were prefixed with the letter 'N' or 'S' depending on whether the sheet was north or south of the equator. The 6° wide longitudinal zones were numbered 1 to 60 from East to

West starting at the 180° meridian. Due to the convergence of meridians above 60°N, sheets could consist of more than one longitudinal zone i.e. 12° or 24° wide sheets longitudinally. The mapping of the Antarctic was not included in these early deliberations.

¹¹ Anonymous, 'International Map of the World', *Geographical Journal* 36 (1910): 179-184.

¹² Arthur R. Hinks, 'The 1/M Map of Brazil', *Geographical Journal* 62 (1923): 38-40.

¹³ Service Géographique de L'Armée, *Rapport sur les Travaux Exécutés du 1er août 1914 au 31 décembre 1919: Historique du Service Géographique de l'Armée pendant la Guerre* (Paris, Service Géographique de l'Armée, 1936). For a brief review of the Paris conference, see Emmanuel de Margarie, 'La carte internationale du monde et la Conférence de Paris (10-18 décembre 1913)', *Annales de Géographie* 32 (1914): 97-108.

¹⁴ Michael Heffernan, 'Geography, cartography and military intelligence: The Royal Geographical Society and the First World War', *Transactions of the Institute of British Geographers*, 21 (1996): 504-33. See also Yolanda O'Donoghie, *The Ordnance Survey 1914-1918*, in W.A. Seymour (Ed.), *History of the Ordnance Survey*, (Folkestone, William Davis, 1980) 220-30 and Service Géographique de L'Armée, *Rapport sur les Travaux Exécutés* (see note 13).

¹⁵ Anonymous, 'War work of the Society', *Geographical Journal*, 53 (1919): 336-9.

¹⁶ Malcolm N. MacLeod, 'The present state of the International 1/M Map', in *Ordnance Survey Professional Papers: New Series. Papers Read at the British Association Meeting of 1925 on the Work of the Ordnance Survey including an Account of the Work of the International Bureau of the 1/M Map which is located at the Ordnance Survey Office, Southampton, 1926* (London, Ordnance Survey, 1926) 11-13.

¹⁷ Service Géographique de L'Armée, *Rapport sur les Travaux Exécutés* (see note 13).

¹⁸ Hinks, 'The 1/M Map of Brazil' (see note 12).

¹⁹ The Central Bureau had originally fixed the German share of the map to five sheets. Due to changes in the political boundaries after World War One, two sheets of its portion were transferred to Poland and Czechoslovakia. In order to gain complete representation of the German-speaking territory, the Reichsamt für Landesaufnahme published an additional five unofficial sheets of East Prussia, Vienna, Upper Silesia, Central Alpine area and the Eastern Alpine area between the wars. These unofficial sheets corresponded to the original IMW specification apart from the use of place names. In the case of places abroad with a prevailing German language, only the German names were used. In the case of places where the German language was in

the minority, the German name was used first and the foreign name was placed underneath in brackets.

²⁰ For a detailed account of the Hispanic Map, see Alastair Pearson and Michael Heffernan, 'The American Geographical Society's Map of Hispanic America: million-scale mapping between the wars', *Imago Mundi* 61 (2009): 215-243. See also John Kirtland Wright, *Geography in the Making, 1851-1951* (New York, American Geographical Society, 1952).

²¹ The authors are grateful to John L. Cruickshank for supplying his translation of A. M. Komkov's, *Fifty Years of Soviet Geodesy and Cartography* (Moscow, Izdatelstvo Nedra, 1967) 254-67. Though the Soviet Union withdrew its involvement in the IMW, a project entitled the 'Coordinated Arrangement of Survey Plane-Table Sheets and the Making from them of Maps in Metrical Scales' in 1919 recommended the creation of strictly defined map series at the scales of 1:25,000, 1:50,000, 1:100,000, 1:300,000, and 1:1 million, the sheet lines and sheet numbering systems of which were based on that used by the IMW. The first sample sheets of the 'State of the Soviet Union 1:1,000,000' were published as early 1926 and a further 80 completed by 1939, though they were not made publicly available.

²² W. L. G. Joerg, 'Development and state of progress of the United States' portion of the International Map of the World', *Bulletin of the American Geographical Society* 44 (1912): 838-44.

²³ Dean S. Rugg, 'The International Map of the World', *Scientific Monthly* 72 (1951): 233-40.

²⁴ Emil Meynen, *Carte Internationale du Monde au Millionième* (see note 4).

²⁵ Arthur R. Hinks, 'The 1/million map of Europe', *Geographical Journal* 94 (1912): 404-9.

²⁶ On Crawford's remarkable life and work, see Kitty Hauser, *Bloody Old Britain: O. G. S. Crawford and the Archaeology of Modern Life* (London, Granta, 2008).

²⁷ Anon., 'Tabula Imperii Romani', *Geographical Journal* 86, 6 (1935): 523-6.

²⁸ For more detailed accounts of progress into the 1950s and 1970s, see Freeman W. Adams, 'Tabula Imperii Romani', *American Journal of Archaeology* 58 (1954): 45-51; and R. A. Gardiner, 'The International Map of the Roman Empire', *Geographical Journal* 139 (1973): 107-111.

²⁹ Sven Hedin, 'Zum Zentralasian-Atlas', *Petermanns Geographische Mitteilungen* 87 (1941): 1-2; Herman Haack, 'Sven Hedins Zentralasian-Atlas', *Petermanns Geographische Mitteilungen* 87 (1941): 2-7, with 2 figs. For a comment on the first sheet of Hedin's proposed atlas from occupied France, see Emmanuel de Margarie, 'L'atlas de l'Asie central de Sven Hedin', *Annales de Géographie* 50 (1941): 196-200.

³⁰ Sven Hedin, *Central Asian Atlas* (Stockholm, Statens Etnografiska Museum, 1966). Hedin's atlas built on an earlier series of 15 less detailed million-scale map sheets of a smaller area surveyed before World War One. These were published as part of his *Southern Tibet: Discoveries in Former Times Compared with My Own Researches* (Stockholm, ?, 1917-22). See also Sven Hedin (in collaboration with Folke Bergman), *History of an Expedition into Asia 1927-35* (Stockholm, Statens Etnografiska Museum, 4 Vols, 1943-5). For a recent commentary, see Philippe Forêt, 'Les frontières du *Central Asia Atlas* de Sven Hedin: un exemple de dilemme politique', *Bulletin du Comité Français de Cartographie* 187 (2006): 51-64.

³¹ The most comprehensive source for World War Two mapping at the million scale is Franz von Grenacher, 'Die Internationale Weltkarte, 1:1,000,000 in Zeitspeschen', *Geographica Helvetica* 2 (1947): 112-22.

³² Production of million-scale mapping was of exceptional importance during the years of the 'Great Patriotic War 1941-1945' when the provision of such topographic maps to the Soviet Army was needed. Huge effort was put into the production of the series. See Komkov, *Fifty Years of Soviet Geodesy and Cartography* (see note 21).

³³ International Map of the World, *Carte du Monde au Millionième: Rapports de 1921-1939/The International 1:1,000,000 Map: Reports for 1921-1939* (Southampton, Ordnance Survey, 1921-1939).

³⁴ Malcolm MacLeod, *La Carte Internationale du Monde au Millionième: Union Géographique Internationale, Congrès Internationale de Géographie, Le Caire - Avril 1925*. Compte Rendu publié par le Secrétaire Général du Congrès (Adolphe Cattau) Vol. 2 (IGU, 1925) 15-24.

³⁵ Dean S. Rugg, 'The International Map of the World', *Scientific Monthly* 72 (1951): 233-40.

³⁶ A. H. Burton, *Conquerors of the Airways: A Brief History of the USAF-ACIC and Aeronautical Charts* (St. Louis, U.S. Aeronautical Chart and Information Center, 1953).

³⁷ *Ibid.* and T. B. Cantrell, 'The Aeronautical Chart Service', *Military Engineer* 39 (1947): 328-329. With the support of other government agencies and commercial contractors, this mapping programme later included compilation of World Long Range Charts at a scale of 1:3 million (commenced in July, 1941) and a World Planning Series at a scale of 1: 5,000,000 (commenced in November 1941).

³⁸ J. D. Kay, 'Capsule charts for universal navigation', *Navigation* 2 (1950): 202-8.

³⁹ 'Report on the activity of the International Geographical Union during 1946. Presented at the meeting of the Executive Committee of the International Council of the Scientific Unions, at Paris, July 2-3, 1947 by Emmanuel de Martonne, President of the International Geographical Union'.

This report, and much of the material that follows, can be found in the un-catalogued files of John Kirtland Wright in the AGS Archives held within the Golda Meir Library, University of Wisconsin-Milwaukee (hereafter Wright Papers, AGS Archives).

⁴⁰ 'National Committee of the United States of the International Geographical Union, 1948, Memorandum 12, September 16, 1948' (Wright Papers, AGS Archives).

⁴¹ Support for American involvement was not unanimous. In a letter to Cressey on 12 April 1948, Isaiah Bowman complained that it was too soon to hold a Congress as "the political and military situation is so tense and the risk of failure so great". Bowman had little confidence that ageing IGU President was up to the task, declaring that "de Martonne was not the man to be the leader; Lisbon was not the place; and one-man control of the Congress will only lead us into deeper difficulties when the company gathers at Lisbon. De Martonne has been in control too long". Cressey shared Bowman's misgivings, uncharitably describing de Martonne in a letter to Wright on 18 September 1948 as "old and docile". This issue clearly had a bearing on American plans to organise the 1952 Congress for if the US refused to become fully involved in the IMW, the prospects of the US hosting the IGU were greatly diminished (Wright Papers, AGS Archives).

⁴² Wright was a renowned historian of geography and cartography in the Medieval period and an influential early proponent of what would later be called 'humanistic geography'. See John K. Wright, *The Geographical Lore of the Time of the Crusades: A Study in the History of Medieval Science and Tradition in Western Europe* (New York, American Geographical Society, 1925); John K. Wright, *The Geographical Basis of European History* (New York, H. Holt & Co., 1928); and John K. Wright, 'Terra incognitae: the place of imagination in geography', *Annals of the Association of American Geographers* 37 (1947): 1-15. For an early commentary that extended Wright's ideas by his successor at the American Geographical Society, see David Lowenthal, 'Geography, experience, and imagination: towards a geographical epistemology', *Annals of the Association of American Geographers* 51, 3 (1961): 241-60. For recent commentaries on Wright's influence, see William A. Koelsch, 'William H. Tillinghast, John K. Wright, and some antecedents of American humanistic geography', *Journal of Historical Geography* 29, 4 (2003): 618-30; and Innes M. Keighren, 'Geosophy, imagination, and *terrae incognitae*: exploring the intellectual history of John Kirkland Wright', *Journal of Historical Geography* 31, 3 (2005): 546-62.

⁴³ Wright to Cressey, 12 May 1948 (Wright Papers, AGS Archives).

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- ⁴⁴ 'National Committee of United States of the International Geographical Union, Memorandum 12, September 16, 1948' (Wright Papers, AGS Archives).
- ⁴⁵ Wright to Cressey, 21 September, 1948 (Wright Papers, AGS Archives).
- ⁴⁶ After his appointment as Director-General of the Ordnance Survey in 1949, Brown sought to impose order and coherence on a previously rather chaotic organisation. The principles underlying the Ordnance Survey's post-war objectives had never been formally specified and Brown immediately set about defining a new policy to ensure significant savings in staff costs. See the relevant section in W. A. Seymour (Ed.), *History of the Ordnance Survey* (Folkestone, William Davis, 1980).
- ⁴⁷ Brown to Wright, 19 July 1949 (Wright Papers, AGS Archives).
- ⁴⁸ Brown to Wright, 15 August 1949 (Wright Papers, AGS Archives).
- ⁴⁹ Brown to Wright, 19 July 1949 (Wright Papers, AGS Archives).
- ⁵⁰ Martin Gilbert, *A History of the Twentieth Century: Volume 2, 1933-1951* (London, Harper Collins, 1998).
- ⁵¹ See Dean Rugg, 'The International Map of the World', *Scientific Monthly*, 72 (1951): 233-40. See also Te-Lou Tchang, 'International cooperation on cartography with particular reference to the United Nations', *Surveying and Mapping* 13 (1953): 509-14. More detailed information concerning the work of the UN with regard to intergovernmental organisations and cartographical coordination can be found in the following 'E' Bulletins of ECOSOC: 257, 258, 483, 609, 620, 649, 695, 963, 1070, 1318, 1322, 1449, 1450, 1467, 2022, and 2117.
- ⁵² Brown to Wright, 19 July 1949 (Wright Papers, AGS Archives).
- ⁵³ Brown to Wright, 10 April 1952 (Wright Papers, AGS Archives).
- ⁵⁴ G. Delmelle to Wright, unspecified date in June 1951 (Wright Papers, AGS Archives).
- ⁵⁵ Kirwan to Wright, 21 May 1952 (Wright Papers, AGS Archives).
- ⁵⁶ Brown suggested that Wright would need to "concoct a polite letter to Dr Leite de Castro in such a way as not to give offence". Brown to Wright, 25 April 1951 (Wright Papers, AGS Archives).
- ⁵⁷ Wright to Brown, 3 May 1951 (Wright Papers, AGS Archives).
- ⁵⁸ Brown to Wright, 8 May 1951 (Wright Papers, AGS Archives).
- ⁵⁹ Miller to Wright, 19 July 1951 (Wright Papers, AGS Archives).
- ⁶⁰ Ibid.
- ⁶¹ Nolan to F. J. Alcock, 24 August 1951 (Wright Papers, AGS Archives).
- ⁶² Ibid.
- ⁶³ Secretary for External Affairs, Union of South Africa to Wright, 30 October 1951 (Wright Papers, AGS Archives).
- ⁶⁴ Lambert to Alcock, no date (Wright Papers, AGS Archives).
- ⁶⁵ MacNeill to Alcock, 4 July 1951 (Wright Papers, AGS Archives).

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- ⁶⁶ D. I. Burnett (Ordnance Survey) to Wright, 28 December 1950 (Wright Papers, AGS Archives).
- ⁶⁷ J. Lathbury (Ordnance Survey) to Alcock, no date (Wright Papers, AGS Archives).
- ⁶⁸ Japan's potential contribution suffered a similar blow as its original IMW plates were lost to Allied bombing during the war, with only proof copies surviving of some sheets. See Katsuhiko Muto (Director the Japanese Geographical Survey Institute) to Alcock, no date (Wright Papers, AGS Archives).
- ⁶⁹ F. Saad to Alcock, no date (Wright Papers, AGS Archives).
- ⁷⁰ E. R. Wilson (Survey of India) to Alcock, no date (Wright Papers, AGS Archives).
- ⁷¹ Seppälä to Alcock, no date (Wright Papers, AGS Archives).
- ⁷² Wright to Brown, 19 November 1951 (Wright Papers, AGS Archives).
- ⁷³ Brown to Wright, 14 February 1952 (Wright Papers, AGS Archives).
- ⁷⁴ Brown to Wright, 10 April 1952 (Wright Papers, AGS Archives).
- ⁷⁵ Wright to Brown, 19 November 1951 (Wright Papers, AGS Archives).
- ⁷⁶ H. Schamp (ed.), *International Map of the World/ Carte Internationale du Monde Exhibition: Catalogue of the Map Exhibition held on the Occasion of the United Nations Technical Conference on the International Map of the World on the Millionth Scale, Bonn 1962* (Bonn, Institut für Landeskunde).
- ⁷⁷ Emil Meynen, *Carte Internationale du Monde* (see note 4).
- ⁷⁸ International Map of the World, *United Nations Technical Conference on the International Map of the World on the Millionth Scale: Reports and Proceedings of the Conference, Bonn, 3-22 August 1962* (New York, United Nations, 1963).
- ⁷⁹ International Map of the World, *International Map of the World on the Millionth Scale: Reports for 1962-1977* (New York, United Nations, 1962-79).
- ⁸⁰ Arthur H. Robinson, 'The future of the International Map', *Cartographic Journal* 2 (1965): 23-6.
- ⁸¹ International Map of the World, *Report of the Meeting of United Nations Ad Hoc Group of Experts on the International Map of the World on the Millionth Scale (IMW), 9th - 11th December 1986: Papers Submitted by the United Nations Secretariat at the Fourth United Nations Regional Cartographic Conference for the Americas 23rd - 27th January 1989, Item 5 (f) of Provisional Agenda, 1989*, United Nations Economic and Social Council: New York.
- ⁸² J. M. Roberts, *Shorter Illustrated History of the World* (Bath, Bath Press, 1995).
- ⁸³ Tchang, 'International cooperation' (see note 51).
- ⁸⁴ O. G. S. Crawford, 'Mapping the Roman Empire: review of sheets HI.33 (Lepcis Magna) and HI.34 (Cyene)', *Geographical Journal* 120 (1954): 363-4.

⁸⁵ Ibid., 363

⁸⁶ Norman J. Thrower, *Maps and Civilization: Cartography in Culture and Society* (Chicago, University of Chicago Press, 2007).