The European Journal of International Law Vol. 25 no. 2

Scientific Reason and the Discipline of International Law

Anne Orford*

Abstract

International law emerged as a professional academic specialization in a 19th century European context of wide-ranging public debates about the nature and cultural significance of science. Ever since, the status of international law as an academic discipline has been intimately connected with the capacity of international lawyers to demonstrate that our discipline is properly scientific. Yet the ideals of science upon which international lawyers have drawn in seeking to demonstrate the scientific nature of our work have not remained static. This article explores how those shifting ideals of science have shaped the concerns, questions, methods, and theories adopted by professional legal scholars in different times and places, including the 19th century Cambridge of Whewell, the 20th century Vienna of Kelsen, the post-war New Haven of McDougal and Lasswell, and the globally networked university of the 21st century. In returning to the historical debates out of which today's highly stylized versions of positivist and policy-oriented international law emerged, the article shows that while scholars of international law have shared a commitment to scientific values of rationality, progress, and objectivity, they have understood those commitments as requiring different forms of conduct, different means of producing knowledge, and different relations to the state.

1

The theme for the fifth European Society of International Law Research Forum invited participants to think about international law as a profession, and the different professional roles that international lawyers play.[1] I was asked to reflect in particular upon international law as an academic discipline, and thus on the institutional and social constraints that shape the role of the international lawyer as a professional scholar.

* Michael D. Kirby Chair of International Law and Australian Research Council Future Fellow, University of Melbourne. Email: a.orford@unimelb.edu.au.

[1] ESIL Research Forum, 'International Law as a Profession', 23–25 May 2013, Amsterdam.

One of the challenges of writing on this theme of international law as a profession is methodological. As professionals, we have a mass of experiential material on which to draw in developing an account of international law as a profession. But how to reduce that chaos (or wealth, on days when one wakes up feeling more optimistic) of anecdote, impression, and history into conventionally recognizable facts, that can be abstracted into precise and communicable concepts, and perhaps then codified into a useful set of axioms or laws that might help direct the writing of future such papers? Of course, that very problematic of how to transform the chaos of the world into a theory that somehow reduces complexity into a manageable and useful form has intrigued scientists, including legal scientists, since at least the 19th century. It is that question of method that I am going to take as the focus of my discussion.

As my title suggests, I am going to address that question through attending to the shifting ideals of scientific method that have underpinned the institutionalization of international law as a professional discipline. For generations, those international lawyers who work in universities have felt called upon to show that our discipline is properly scientific and that it thus has a legitimate place in the academy. Yet the ideals of science upon which international lawyers have drawn in seeking to demonstrate the scientific nature of their work have not remained static. This article explores how those shifting ideals have shaped the concerns, questions, methods, and theories adopted by professional legal scholars in different times and places.

Given the need for economy, I am going to use one particular example of a clash of scientific paradigms as a case study.[2] Already in choosing this means of imposing an artificial simplicity on the complex world of my topic, I am taking a position in a debate about hierarchies of scientific method. Often when we hear people referring to a method as scientific, they are referring to a very particular and idealized version of scientific method used in fields such as physics. Much discussion of scientific method has treated theoretical physics as its ideal, and the production of universal laws as its goal. The task of scientific method understood in this sense is to produce a precise representation of the phenomena being studied in a way that enables the eventual production of universal laws.

Yet it is no longer the case, if it ever was, that the exposition of universal laws either does or can 'serve as a model for all science, even natural science', [3] and particularly legal science. The idea that the universal laws of physics should provide the basis of understanding scientific rationality in general has never been accepted without challenge.[4] There are many other methods of reasoning that characterize the sciences – the one I am drawing on here is reasoning by cases or exemplars (one that

[2] Economy of presentation is both a requirement of conference presentations and more generally a condition of the scientific attempt to produce models that can make sense of the world in a useful form. For the exploration of the idea that no scientific theory 'has any priority except that derived from the economy of its presentation', see A. Janik and S. Toulmin, *Wittgenstein's Vienna* (1973), at 142.

[3] Creager, Lunbeck, and Wise, 'Introduction' in A.N.H. Creager, E. Lunbeck, and M.N. Wise (eds), *Science without Laws: Model Systems, Cases, Exemplary Narratives* (2007) at 1, 4.

[4] *Ibid.*

actually feels quite comfortable to a common lawyer).[5] 'Case-based reasoning', used in biology and biomedicine amongst other fields, involves the use of an 'organism, object or process selected for intensive research as an exemplar of a widely observed feature of life (or disease)'.[6] Biology, like other natural sciences, proceeds through the construction of 'models' based on testable predictions, the performance of controlled experiments, and quantifiable data.[7] However, the function of these models varies across the sciences. So in the hard sciences, generally taken to include physics and chemistry, the model is supposed to function as a mirror of a natural entity or phenomenon. Here the model has a representational function – it is a model *of* something. In contrast, in biology, biomedicine, and related life sciences, a model or an experimental subject has a representative function – it is chosen as a model *for* something. A laboratory subject such as a mouse, a bacterium, or a specific protein is chosen because of its capacity to function as an exemplar, an analogue, or a model for the study of specific attributes.[8]

So, to the case study. My interest in the differing ideals of science that underpin international legal scholarship was inspired in part by the chance juxtaposition of a series of panels I attended at the 2012 meeting of the American Society of International Law. In the first of the two sessions, a 'late-breaking' panel on 'The United Nations and Syria', then US Department of State Legal Adviser Harold Koh spoke about the challenge facing 'modern international lawyers' in seeking to address the complex situation then unfolding in Syria. His vision of the role of international lawyers was close to that he had described in his academic writings on the 'New New Haven School'.[9] For Koh, international law is a process that should not be concerned with 'simplistic analogies and short-sighted solutions' based rigidly on earlier precedents and '"one-size-fits all" thinking', but should rather be aimed at the development of 'nuanced approaches that might deliver lawful and durable solutions to complex global problems'.[10] That problem-solving focus is a familiar one for those who have engaged with the writings of the New Haven school.

In a second session later that day (which seemed strikingly European in contrast), Jörg Kammerhofer, Jean d'Aspremont, and their fellow panellists urged the audience to recognize the value of modern positivism in confronting complexity in international law. Kammerhofer argued in particular for the continued relevance of Kelsen's attempt 'to found a *science* of law and to purify the scholarly enterprise'. In Kammerhofer's words:

> Legal science should be kept free from all those elements foreign to the specific methods of a science whose only purpose is the cognition of law. It may sound frivolous to insist on sticking to the legal method in an age such as ours, where holism and the admixture, willy-nilly, of

[5] For an exploration of case-based reasoning see further Forrester, 'On Kuhn's Case: Psychoanalysis and the Paradigm', 33 *Critical Inquiry* (2007) 782, at 798, 809, 812.

[6] Creager *et al.*, *supra* note 3, at 4.

[7] *Ibid.*, at 2.

[8] *Ibid.*

[9] See Koh, 'Is There a "New" New Haven School of International Law?', 32 *Yale J Int'l L* (2007) 559.

[10] Koh, 'Remarks', 106 *ASIL Proceedings* (2013) 216, at 220.

> methods is praised and sometimes even required by one's peers. But Kelsen's own age was not that different from ours ....[11]

Jean d'Aspremont also argued that international legal positivism can 'constitute a useful tool to approach and understand what we perceive as a growing complexity of this world'.[12] He pointed to the difficulty of communicating a sense of the utility of positivism 'in the land where legal realism was born', but he urged the audience to try and overcome received prejudices about the utility of positivism. Perhaps most importantly, d'Aspremont argued that if we want to address the question of how legal positivism might assist in attempts to comprehend the world we live in, it is necessary to be very precise about its limits. Positivism cannot claim to 'provide a tool for the cognition of all international law', but it can offer a tool for cognition of one aspect of international law, that is, for determining or ascertaining the existence of valid rules. International law, for d'Aspremont, is a set of rules that occasionally needs to be comprehended for a given purpose, and it is at the same time 'much more than a set of rules'.[13]

The difference in tone, vocabulary, method, and style adopted in those two sessions was marked. The 'law' as it was represented in the account given by the American international legal practitioner appeared quite different from the 'law' as it appeared in the theories of European international legal scholars. The conventional explanation for the differences that were revealed in those two sessions at the ASIL meeting is that the American and European traditions of international law are quite distinct – the American tradition portrayed as flexible, informal, instrumentalist, and by inference more subjective; the European tradition portrayed as committed to formality, objectivity, and a studied distance from politics. A second explanation is that Koh's depiction of international law in the earlier session expressed his unmediated experience of the real world of the international legal practitioner, while the positivist depiction of international law in the latter session represented the mediated world of abstract theory. I want to suggest instead that the traditions of legal thinking represented in those sessions share a commitment to scientific values of rationality, progress, and even objectivity, but that they understand those commitments as requiring different forms of conduct, different means of producing knowledge, and different relations to the state. I am interested then in the differing sense the two sessions gave of what it might mean for legal professionals to adopt a properly scientific and rational approach.

I want now to explore briefly the ideal of science that underpins four moments that can help to make sense of that 'case study'. The first is the 19th century European debate about the hierarchy of the sciences that was closely connected to the process of disciplinary professionalization and specialization. The second is the debate about scientific knowledge that was swirling around early 20th century Vienna and that shaped the thinking of Hans Kelsen. The third is the vision of science that informed

[11] Kammerhofer, 'The Pure Theory of Law and Its "Modern" Positivism: International Legal Uses for Scholarship', 106 *ASIL Proceedings* (2013) 365.

[12] D'Aspremont, 'Reductionist Legal Positivism in International Law' 106 *ASIL Proceedings* (2013) 368.

[13] *Ibid.*, at 370.

the Yale school in its attempt to marry international law and policy science after World War II – a vision of science that in a negative sense led Hans Morgenthau to reject as utopian the attempt by 'scientific man' to impose order upon 'power politics'.[14] The final moment is represented by debates about the role of science in relation to the university and the public today. What ideal of science underpins the problem-solving interdisciplinary model favoured by today's global academic managers and funders? What kind of pressure do demands for political relevance, functional utility, and financial return place upon legal professionals, and what opportunities might such demands in turn open up?

2

International law emerged as a professional academic specialization in a 19th century European context of wide-ranging public debates about the nature and cultural significance of science. During this period the hard sciences had begun to emerge as a pre-eminent force because of their claim to be constructed around universal laws. Astronomy was the queen of the sciences according to William Whewell, to whom I will return in a moment, with physics a close second. Legal scholars in turn sought to present law as a study characterized by a search for universal principles and the codification of knowledge.

William Whewell was indeed a key figure here. That name is of course very familiar to international lawyers, because it was Whewell's will that provided for the establishment of the Whewell Professorship of International Law at the University of Cambridge.[15] Whewell was the long-time Master of Trinity College Cambridge, and widely recognized as one of the most influential 'men of science' of his age, not just in Britain but across Europe.[16] That was a period before English universities had embarked on the process of educational reform and specialization that would make them recognizably modern institutions, and before the professional academic demarcations of the 20th century had separated questions of law, philosophy, political economy, and the philosophy of science from the practice of science.[17] So Whewell was a critic of science, a man of science, and a theorist. Whewell published two monumental works on the history and philosophy of science,[18] and also wrote on what today seems an astonishing range of subjects, including astronomy, mathematics, mechanics, geology, mineralogy, electricity, magnetism, moral philosophy, political economy, theology, and international law.[19] Whewell was also ordained as a priest in 1825, as

[14] H. Morgenthau, *Scientific Man versus Power Politics* (1946).

[15] Editorial Comment, 'The Whewell Professorship of International Law', 2 *AJIL* (1908) 862.

[16] R. Yeo, *Defining Science: William Whewell, Natural Knowledge, and Public Debate in Early Victorian Britain* (2003).

[17] *Ibid.*, at 4.

[18] Rev. W. Whewell, *History of the Inductive Sciences, From the Earliest to the Present Times* (1837); W. Whewell, *Philosophy of the Inductive Sciences, Founded Upon their History* (1840).

[19] Snyder, 'William Whewell' in E.N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy (Winter 2012 Edition)*, available at: http://plato.stanford.edu/archives/win2012/entries/whewell/.

was required of Fellows at Trinity, and published a series of volumes containing a collection of the sermons he preached in the Trinity Chapel.[20]

Whewell had long been interested in international law. He included a section on 'International Jus: Rights and Obligations Between States' in his *Elements of Morality including Polity* in 1845,[21] and in 1853 published an edition of Hugo Grotius' *De Juri Belli et Pacis Libri Tres*.[22] In the preface to his edition of *De Juri Belli*, Whewell praised the 'scheme and reasoning of Grotius's work', in particular its reliance upon 'solid philosophical principles consistently applied', the 'clear and orderly distinction of parts', the use of 'definite and exact notions' informed by the discipline of legal study, its 'pure and humane morality', and the 'pervading though temperate spirit of religion' throughout.[23] Amongst the many letters Whewell received commending that publication, one from 'an eminent statesman and scholar' began by praising Whewell for his 'useful service to all students of international law and politics' while bemoaning the lack of any commentators to equal Grotius in England:

> It is remarkable that no English writer has produced any work of authority on International law … I wish some University man, who understands law and moral history would undertake a treatise on the subject. In the present state of the science, an extensive knowledge of positive law would be indispensable.[24]

It was perhaps with such an end in mind that Whewell's will provided for the establishment of the Whewell Professorship of International Law and a series of Whewell Scholarships for International Law at Cambridge. In making that bequest, Whewell was 'moved by the Christian and noble wish of diminishing the evils of war when it happens, lessening the chances of its happening, and finally extinguishing it, so far as lies within the reach of man's foresight'.[25] According to the Cambridge economist Alfred Marshall, Whewell's aim was 'to contribute to the formation of a strong body of experts on International Law, distributed among the chief countries of the world', such that 'every nation would be willing, if not to accept the general verdict of such experts, at least to hesitate to impute malignity to another nation whose conduct was declared by the common opinion of experts in neutral countries to be technically correct'.[26]

Whewell's desire to contribute to diminishing the evils of war through the establishment of a body of experts in international law can be understood as part of his commitment to the development and application of scientific method more generally.

[20] See, e.g., W. Whewell, *Sermons preached in the Chapel of Trinity College, Cambridge* (1847).

[21] W. Whewell, *The Elements of Morality, Including Polity* (1845).

[22] Hugonis Grotii, *De Juri Belli et Pacis, accompanied by an abridged translation by William Whewell DD Master of Trinity College and Professor of Moral Philosophy in the University of Cambridge with the Notes of the Author, Barbeyrac, and others* (1853).

[23] Whewell, 'Editor's Preface' in *ibid*, iii at v.

[24] I. Todhunter, *William Whewell, D.D., Master of Trinity College: An Account of his Writings; with Selections from his Literary and Scientific Correspondence, Volume 1* (1876), at 272.

[25] *The Law Times*, 27 Oct. 1866, cited in Jennings, 'An International Lawyer Takes Stock', 39 *ICLQ* (1990) 513.

[26] Marshall, 'Whewell Scholarships: Letter 871 to Courtney Stanhope Kenny, 29 April 1907' in J.K. Whitaker (ed.), *The Correspondence of Alfred Marshall, Economist: Volume 3, Towards the Close, 1903–1924* (1996), at 155–156.

Whewell lived during a period in which scientific institutions were not yet well established or securely funded. Very few people could make a living from science, and as a result men of science 'had to justify their activities and their cultural impact in a more direct dialogue with the lay public'.[27] The new scientific rationalism of the early 19th century continued to be understood and justified through its connection with natural theology, particularly to the extent that scientific findings and theories were concerned with the relation between man and nature.[28] Yet the older forms of clerical science were coming under pressure, both because rival religious denominations were developing rival scientific theories, and because the discoveries of the new men of science did not always support Biblical accounts of creation and of the place of man in the world. Men of science were thus also engaged in a search for ways of distinguishing their new sciences from the old natural theology.

In England, these debates turned particularly around questions of method. The focus on method effectively killed two birds with one stone – it was a way of affirming the value of science to a lay public and it was a way of making an argument for science as an autonomous field that was independent from theology. Scholars such as Whewell's friend John Herschel had placed questions of method at the centre of attempts to define science as a vocation.[29] Whewell's commentaries and critiques in turn developed an 'ideology of method' as a means of justifying, defining, and promoting the rapidly expanding scientific enterprise.[30] At the 1833 meeting of the British Association for the Advancement of Sciences, Whewell declared that:

> Astronomy … is not only the queen of the sciences, but, in a stricter sense of the term, the only perfect science – the only branch of human knowledge in which particulars are completely subjugated to generals, effects to causes.[31]

Astronomy and mathematics were understood to be the pre-eminent sciences because of their claim to provide a method that was capable of producing precise representations of phenomena being studied and eventually general laws. For sciences that had not yet developed to that state – such as political economy or international law – the goal was to gather the necessary data from which to develop social sciences of induction.[32] It was for this reason that in 1833 Whewell co-sponsored the establishment of a Statistical Section (later Section F) of the British Association for the Advancement of Sciences, to produce the data that could be the basis for the study of political economy

[27] Yeo, *supra* note 16, at 45.

[28] R.M. Young, *Darwin's Metaphor: Nature's Place in Victorian Culture* (1985), at 126–127.

[29] J. Herschel, *A Preliminary Discourse on the Study of Natural Philosophy* (1830).

[30] Henderson, 'The Place of Economics in the Hierarchy of the Sciences: Section F from Whewell to Edgeworth', in P. Mirowski (ed.), *Natural Images in Economic Thought* (1994), at 484.

[31] *Ibid.*, at 490. The other major European scientific commentator of the age, Auguste Comte, similarly set out what he referred to as a 'hierarchy of the sciences', maintaining that the sciences progress through the three stages of development (theological to metaphysical to positive) at quite different rates. Thus, for Comte, astronomy, the most general of all the sciences, develops first and is followed successively by physics, chemistry, biology, and finally sociology. However, for Comte the hierarchy of the sciences is inverted – the queen of the sciences is sociology as it is the most fundamentally complex. See Cole, 'The Hierarchy of the Sciences?', 89 *Am J Sociology* (1983) 111, at 112.

[32] Henderson, *supra* note 30, at 486.

(and thus in a sense setting in train the mathematical revolution that would lead to neoclassical economics).[33] However, when the Statistical Section began to attract too much interest from the general public (including from women) and from progressive reformers who proposed new questions about what data should be gathered, Whewell was one of the people who attempted to shut it down.[34] Whewell felt that the Statistical Section should only have concerned itself with 'those classes of facts relating to communities of men which are capable of being expressed in numbers, and which promise, when sufficiently multiplied, to indicate general laws', but instead the Section had allowed itself to become 'an ambulatory body, composed partly of men of reputation, and partly of a miscellaneous crowd', which unwisely sponsored discussions of 'the most inflammatory and agitating questions of the day'.[35]

Whewell's concern at the failure of his colleagues properly to distance themselves from political questions points to the significant shifts that were taking place in Britain during this period in relation to the meaning of the 'public sphere'. In the early part of the 19th century, there had been no clear distinction between scientific experts and lay people. Scientific bodies were amateur organizations of men who depended upon the patronage of influential figures in government or elite society but had no distinct training and no formal relationship to the state. Debates about the status of science were aimed at conveying scientific discoveries to a lay public, and in so doing demonstrating the usefulness of science as part of broader 'polite culture'.[36]

Yet the idealist tones in which public debate was envisaged depended upon the assumption that there existed a 'uniform public constituted by shared political and social values' or, in other words, determined by class.[37] Throughout the 19th century, the upheavals unleashed by the American and French revolutions, the social distress caused by industrial transformation, the success of working class mobilization, and the demand for electoral reforms transformed understandings of the relation between the British state and the public.[38] Debates over the role of facts or statistics in the development of political economy as a neutral science of government can thus be seen as symptoms of a broader challenge. Men of science could no longer assume that publicity was a reliable means of building support for scientific endeavours amongst the members of educated society. Publicity could equally invoke the kinds of fraught political encounters that resulted once the meaning of the 'public' had been expanded

[33] On the importance of debates about method and the philosophy of science in Victorian England to the mathematical revolution that shaped neoclassical economics see M. Schabas, *A World Ruled by Number: William Stanley Jevons and the Rise of Mathematical Economics* (1990); D.A. Redman, *The Rise of Political Economy as a Science: Methodology and the Classical Economists* (1997).

[34] Henderson, *supra* note 30, at 494–504.

[35] I. Todhunter, *William Whewell, D.D., Master of Trinity College, Cambridge: An Account of his Writings; with Selections from his Literary and Scientific Correspondence, Volume 2* (1876), at 291.

[36] J. Gascoigne, *Joseph Banks and the English Enlightenment: Useful Knowledge and Polite Culture* (1994).

[37] Yeo, *supra* note 16, at 42.

[38] See generally B. Hilton, *A Mad, Bad, & Dangerous People? England 1783–1846* (2006); J. Gascoigne, *Science in the Service of Empire: Joseph Banks, The British State and the Uses of Science in the Age of Revolution* (1998); E.P. Thompson, *The Making of the English Working Class* (1966).

through extension of the franchise.[39] In that increasingly democratic climate, public opinion could no longer be relied upon as a foundation for gentlemanly debate but began to be feared as a potential threat to property, freedom, and the established political order of church and state. Questions about the relation between fact and value in the scientific process, the proper part to be played by the public in shaping the priorities and uses of scientific research, and the role of science in government have dogged the human sciences, including the science of international law, ever since.

3

How then did the 19th century hierarchy of the sciences inform the model of scientific method adopted by the early systematizers of international law in Europe, and how did the challenge of reconciling scientific expertise with democratic politics shape their thinking? Here I will focus upon the ideal of science that underpinned the theorizing of Hans Kelsen in early 20th century Vienna. Vienna at that time was a place of great political, scientific, and cultural ferment. Kelsen's thinking was informed by a group of scientists, musicians, artists, architects, philosophers, and jurists who saw themselves as confronting common problems relating to representation and the limits of language.

The decline and fall of the Hapsburg Empire had left Vienna effectively marooned in a 'superpower plagued by problems of rapid economic change', with an 'established constitutional structure' that was 'incapable of adapting itself to the novel demands of its changing historical situation'.[40] The rulers of Austria were faced with the challenge of transforming the remnants of a 'dynastic agglomeration of kingdoms and principalities' into the kind of modern, centralized, bureaucratic state that had proved capable of responding to the challenges of 'industrialisation and mass democracy'.[41] For many intellectuals, artists, and scientists, the speed and scope of the resulting political and social transformations meant that Vienna had become a society in which all established forms of expression, 'from the language of politics across the board to the principles of architectural design', had ceased to perform their intended 'functions'.[42] The concern with language as 'the crucial instrument of thought' shared by the intellectuals of Kelsen's Vienna was motivated by a 'moral hatred' for careless or imprecise expression,[43] based on a concern at the ease with which language was being used to deceive, manipulate, or mislead. The resulting 'critique of the means of expression used in all fields' was aimed at restoring the capacity of language to fulfil its 'original and proper functions once again'.[44]

In this, Kelsen and his interlocutors were profoundly influenced by late 19th century debates about the status of scientific knowledge, and particularly by the

[39] Yeo, *supra* note 16, at 42.
[40] Janik and Toulmin, *supra* note 2, at 30.
[41] F. Field, *The Last Days of Mankind: Karl Kraus and his Vienna* (1967), at 32.
[42] Janik and Toulmin, *supra* note 2, at 30.
[43] *Ibid.*
[44] *Ibid.*

methodology and philosophy of science developed by the Austrian physicist Ernst Mach.[45] For Mach, the goal of science was the most economical abstract expression of sense data. He was violently opposed to metaphysical speculation, which he considered to be merely obfuscation.[46] Mach developed a critical and historical approach to the study of physics that was designed to show the points at which factors that were not strict descriptions of sense data had crept into physical theory, thus leading to scientific observations that 'transcended the limits of the observable'.[47] Mach sought to purify science of its theological traces, exploring the history of mechanics in order to point to the moments 'where metaphysics entered in to confuse the physicist'.[48]

We can hear in Kelsen's call for a 'pure theory' an echo of the philosophy of Mach – in particular the ideas that representation is a problem of language, that science must be stripped of metaphysical or meaningless decoration, and that it is politically necessary for science to avoid imprecise concepts that can lead to misunderstanding and abuse. Kelsen portrayed his project as a science of law – a science that required the study of law to be based upon a scientific method for acquiring knowledge and comprehension of the law.[49] Legal science, like natural science, had to 'formalize its subject matter' in order to grasp it.[50] The role of the scientist was to establish a system of concepts, through which the 'immense wealth of positive legal material' could be 'mastered'.[51] Kelsen's new 'conceptual apparatus' thus necessarily maintained a 'certain independence from the current content' of any actually existing and 'historically conditioned positive law'.[52] That independence was evidence that legal science was capable of an objective grasp of the principles to be found in every legal system, and that legal science was thus comparable to the methods used by natural science to discover general laws. It was because Kelsen's conceptual world was radically abstracted from 'the concrete legal experience on which it was based' that his pure legal concepts could be 'arranged into a system aimed at coherence, unity, hierarchy, and logic'.[53]

It is worth keeping in mind why this mattered to Kelsen. Kelsen's 'formal understanding of legal scholarship' was an attempt to 'expel the political from the realm of legal cognition'.[54] Monica García-Salmones has recently argued that this was a sleight of hand, and that Kelsen sought to replace a proper sense of the political with

[45] Field, *supra* note 41, at 28, 245; J. Blackmore, R. Itagaki, and S. Tanaka (eds), *Ernst Mach's Vienna 1895–1930* (2001).

[46] E. Mach, *Contributions to the Analysis of the Sensations* (trans. C.M. Williams, 1897).

[47] Janik and Toulmin, *supra* note 2, at 137.

[48] *Ibid.*, at 137, 141.

[49] See particularly H. Kelsen, *Pure Theory of Law* (trans. M. Knight, 1967). For discussions that consider the scientific method developed by Kelsen see Kunz, 'The "Vienna School" and International Law', 11 *NYU L Q Rev* (1933–1934) 370; Stewart, 'The Critical Legal Science of Hans Kelsen', 17 *J L and Society* (1990) 273; L. Vinx, *Hans Kelsen's Pure Theory of Law: Legality and Legitimacy* (2007); M. García-Salmones Rovira, *A Science of Interests: The Project of 20th Century Positivist International Law* (2012).

[50] J. von Bernstorff, *The Public International Law Theory of Hans Kelsen: Believing in Universal Law* (2010), at 238.

[51] Kelsen, 'Juristischer Formalismus' [Legal Formalism], 6, as cited in *ibid.*, at 238.

[52] von Bernstorff, *supra* note 50.

[53] *Ibid.*, at 240.

[54] *Ibid.*, at 246.

a highly individualist economic science of interests.[55] Whether or not that is the case, certainly the felt urgency of divorcing legal science from the politics of a particular nation-state was a product of the situation in which Kelsen was working and writing. Kelsen sought to purify the law of politics because of the sense he shared with many other scholars, lawyers, and artists in early 20th century Vienna that existing forms of language (including the language of law) had so ceased to represent the rapidly changing historical situation that all language was dangerously vulnerable to ideological manipulation.[56] The result, for Kelsen's theory of law and for much Austrian scholarly and artistic work during that period, was an attempt to disassociate the 'realm of values' from the 'realm of facts'.[57] Yet that uncompromising separation of facts and values would come under serious challenge in the aftermath of World War II.

4

The ideal of science, including legal science, as objective, rational, and free of ideological manipulation did not survive the horrors of the Holocaust and World War II unchallenged. I would now like to turn to the post-World War II period in the US, the context for the emergence of the New Haven school of policy science and international law.

World War II was a moment of crisis for science and technology, as for many other forms of knowledge. The uses of science (including social science) and of technological innovations by totalitarian regimes was widely interpreted as revealing the vulnerability of science in the ethical domain.[58] Scholars such as Robert Merton sought to respond to that crisis of science by returning to core questions about institutional values and the relation of science to society.[59] How do institutional structures and reward systems privilege certain kinds of scientific endeavours and not others? What conditions make it possible for the forms of scientific research that can be readily enlisted for state, party, military, or corporate ends to benefit from the allocation of collective resources and funding? What social structures give rise to particular scientific priorities? Do scientists owe their primary loyalty to their vocation, their institution, their community, their state, or their funding bodies? And perhaps most importantly, should scientists be asked to account for the human, social, and cultural significance of their science, and if so to whom?

This debate raged with particular urgency in the social sciences. For one very influential body of thought, the lessons to be learned from World War II were that the

[55] García-Salmones Rovira, *supra* note 49.

[56] For the subsequent indictment of positivism as a failed science of international law because it in turn failed in the core tasks of representing 'actual experience' and reconciling 'scientific findings and empirical facts' see Morgenthau, 'Positivism, Functionalism, and International Law', 34 *AJIL* (1940) 260.

[57] Janik and Toulmin, *supra* note 2, at 237.

[58] Fearnley, 'Merton's Science and Society', Anthropological Research on the Contemporary blog, 21 Nov. 2012, available at: http://anthropos-lab.net/bpc/2012/11/mertons-science-and-society.

[59] R.K. Merton, *The Sociology of Science: Theoretical and Empirical Investigations* (1973).

ambition of social science was dangerous and that state planning was a threat to the rule of law.[60] The social scientific task of generating 'programs for a new man' led inevitably to the nightmares of 20th century totalitarianism.[61] For the influential group of conservative American policy-makers and German émigrés who shaped the establishment of international relations as an autonomous discipline in the US, the experience of World War II confirmed their belief that power was irrational, conflict and even enmity were essential features of politics, state behaviour could only at best be partially understood using scientific methods, and international relations should be quarantined from the ambitions of liberal social reformists and their naïve trust in the democratic masses.[62] The theory of international relations that would gain prominence in the US through the influence of figures such as Hans Morgenthau encapsulated a rejection both of rationalist approaches to politics and of positivist approaches to law.[63]

Nonetheless for other scholars and policy-makers, World War II had taught that social science could be a positive thing – that state planning was possible on a large scale. Administrators had applied the new sciences of economics, management, agricultural sciences, and demography to mobilizing the resources of states like Britain and France, to great effect. For example Jean Monnet, like many others, could not see why the achievement of peace should bring these new techniques of rational management to an end.[64] For exponents of state planning (much to the horror of neoliberals like Friedrich Hayek), there was no sense that the expansion of planned economies should cease with the return to peace – rather, they envisaged 'a gradual shift from warfare state to welfare state'.[65] The way to redeem the human sciences in the aftermath of their use by authoritarian governments was not to abandon the scientific ideal, but rather to renew the commitment to rationality while revitalizing the public sphere so that science and technology could be shaped by the people and by democratic institutions. The aim was to bridge 'the gulf between the momentum of scientific research and the democratic process that funds it'.[66]

This is the spirit in which we should understand the contribution of the New Haven school, and particularly its founders Myres McDougal and Harold Lasswell. They sought to develop a marriage of international law and policy science that could

[60] Orford, 'Europe Reconstructed', 75 *MLR* (2012) 275. For the argument about the evils of state planning in its most extreme form see F.A. Hayek, *The Road to Serfdom* (2001) (first published 1944).

[61] Foucault, 'What is Enlightenment?', in M. Foucault, *The Politics of Truth* (2007), at 97, 114.

[62] Guilhot, 'One Discipline, Many Histories', in N. Guilhot (ed.), *The Invention of International Relations Theory: Realism, the Rockefeller Foundation, and the 1954 Conference on Theory* (2011), at 23–27.

[63] *Ibid.*, at 21; M. Koskenniemi, *The Gentle Civilizer of Nations: The Rise and Fall of International Law 1870–1960* (2002), at 436–494. For an alternative reading of the significance of Morgenthau for critical thinking about international law see Orford, 'Critical Theory and International Law', in F. Hoffmann and A. Orford (eds), *The Oxford Handbook of the Theory of International Law* (forthcoming).

[64] See further Orford, 'Hammarskjöld, Economic Thinking, and the United Nations', in H. Melber and C. Stahn (eds), *Peace, Diplomacy, Global Justice, and International Agency: Rethinking Human Security and Ethics in the Spirit of Dag Hammarskjöld* (2014), at 156.

[65] Fox, 'Introduction: How to Prepare a Noble Savage: The Spectacle of Human Science', in C. Fox, R. Porter, and R. Wokler (eds), *Inventing Human Science: Eighteenth-Century Domains* (1995), at 1, 4.

[66] Yeo, *supra* note 16, at 44–45.

answer the question – what is the social significance of your science? Their answer was informed by the optimism of World War II social planning. Indeed many of the fellow travellers of the New Haven school, such as Yale's President Kingman Brewster, had worked on the Marshall Plan in Paris.[67] The development of the New Haven method was a serious attempt to revisit the presuppositions that underpinned theories like Kelsen's – for example, that it was moral to separate the law from nationalistic instrumental uses, and that it was useful to develop an abstract account of a system of legal concepts that was universally true and that did not relate too closely to the posited laws of any existing nation-state or national interpretation of international law. McDougal and Lasswell sought to develop a comprehensive framework of inquiry to understand the operation of international law in a way that was overtly related to the values of a particular democratic polity.

The Vietnam War was a fault line for that generation of legal scientists. It was the point at which serious concerns began to be expressed about the ways in which the New Haven attempt to marry moral values and empirical facts perverted the purity of scientific method. In the words of Oscar Schachter, if the New Haven approach is 'applied with a nationalist basis, it becomes an ideological instrument to override specific restraints of law'.[68] Richard Falk, a student of the New Haven school, came to criticize its 'miraculous' element – the 'uncanny' ability of McDougal to 'apply the eight values' of the New Haven model 'in a manner that consistently accords with US foreign policy'.[69] Nonetheless I think we see in the New Haven school a reworking of the scientific method – an attempt to bring the lessons and the democratic impulses of World War II social science to bear on international law. Why, after all, should we assume that it is a good thing for international law to be divorced from the values or political priorities of the people, once those values or priorities are represented by democratic institutions rather than ruling dynasties, authoritarian governments, or crumbling empires?

5

We are today again living through a period in which professional academics are faced with the question: what is the social significance or the human utility of your science? Academics are called upon to demonstrate the significance of our science both as a political or democratic demand, and as a bureaucratic or institutional demand.

The significance of science is being posed as a political or democratic question because of the weight that science is today being asked to bear in policy-making. Of course to some degree this has long been the case. The idea that facts could produce the foundation of a disinterested approach to government emerged in Britain in the 17th century, and gained ground during a period in which European states were

[67] Koh, *supra* note 9, at 560.

[68] Symposium, 'McDougal's Jurisprudence: Utility, Influence, Controversy', 79 *ASIL Proceedings* 266 (1985), at 273 (remarks of Oscar Schachter).

[69] *Ibid.*, at 281 (remarks of Richard Falk).

wrestling with questions of poverty, famine, and revolution. The attempt to develop a governmental science based on facts emerged as a response to those challenges.[70] Today, before questions of law and government can be determined, issues of fact have to be addressed. Knowledge has to appear objective, impartial, and disinterested if it is to authorize governmental action. Yet in an increasingly globalized world, where many policy questions are shaped by competing knowledge communities and resulting factual uncertainty, it has become increasingly difficult to produce that kind of knowledge about matters of political controversy. Questions about the reliability and interpretation of data and about whether science is objective in the strong sense needed to settle political conflict have become central to many of the most pressing international issues of our time, including the legality of whaling in the Antarctic, the causes of climate change and food insecurity, and the exceptions to trade and investment regimes available to states seeking to protect public health. The perceived objectivity, authority, and verifiability of scientific knowledge have been increasingly relied upon as a 'crucial resource' for resolving international disputes in an authoritative manner.[71]

The climate change debate illustrates that well. Political concerns about the viability and justice of a particular political and economic system of resource extraction and distribution have been translated into a highly technical debate about levels and effects of carbon emissions.[72] The effect of the demands that this policy reliance on data places upon scientific method is well illustrated by the scandal that followed the online posting in 2009 of hacked emails involving correspondence between researchers at the Climatic Research Unit of the University of East Anglia and many of the world's other leading climate scientists. While the subsequent UK and US investigations of British and American climate researchers found no evidence of research misconduct or fraud on the part of the scientists involved,[73] commentators have suggested that the leaked emails nonetheless raise issues about the tendency of the climate scientists involved to play down uncertainties, try to keep papers by those perceived as opponents out of major peer-reviewed journals, and refuse to release data and original computer codes into the public domain.[74] While this behaviour was in many ways

[70] M. Poovey, *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society* (1998).

[71] J. Peel, *Science and Risk Regulation in International Law* (2010), at 171.

[72] Goeminne and Francois, 'The Thing Called Environment: What It Is and How to Be Concerned With It', 32 *Oxford Literary Rev* (2010) 109.

[73] See *RA-10 Inquiry Report: Concerning the Allegations of Research Misconduct Against Dr Michael E. Mann*, Department of Meteorology, College of Earth and Mineral Sciences, The Pennsylvania State University, 3 Feb. 2010 (US); House of Commons Science and Technology Committee, *The Disclosure of Climate Data from the Climatic Research Unit at the University of East Anglia, Eighth Report of Session 2009–10*, 24 Mar. 2010 (UK); *Lord Oxburgh Scientific Assessment Panel*, Apr. 2010 (UK); *RA-10 Final Investigation Report Involving Dr Michael E Mann, The Pennsylvania State University, 4 June 2010* (US); *Independent Climate Change Emails Review* (Muir Russell Review), July 2010 (UK); Environmental Protection Agency, *Denial of the Petitions to Reconsider the Endangerment and Cause or Contribute Finding for Greenhouse Gases under Section 202(a) of the Clean Air Act, Final Rule*, 13 Aug. 2010 (US); Office of Inspector General, US Department of Commerce, *Response to Sen. James Inhofe's Request to OIG to Examine Issues Related to Internet Posting of Email Exchanges Taken from the Climatic Research Unit of the University of East Anglia, UK*, 18 Feb. 2011 (US); National Science Foundation Office of Inspector General, *Closeout Memorandum Case Number A09120086* 15 Aug. 2011 (US).

[74] See F. Pearce, *The Climate Files: The Battle for The Truth about Global Warming* (2010).

understandable given the level and ferocity of political attacks on scientists involved in climate science, the effect was to renew debates about the proper relationship between scientific inquiry and public accountability.[75] The public crisis of science in this and related fields is a serious one, that (again) raises questions about the politics of knowledge production, the social conditions that produce scientific expertise and priorities, the relation of state-funded research to democratic publics, and the power of corporate investors with a lot at stake in debates about issues such as climate change.

In one particularly thoughtful response to that public crisis of climate science, two British academics argued that it is vital to reflect upon 'what Climategate tells us about the practice of science in the 21st Century'.[76] The authority of scientific knowledge can no longer be based on the old ideal of establishing objective claims to universal truth. Rather the authority of scientific knowledge must be based on 'how it has been acquired'.[77] This means conformity to current (and changing) *internal* norms, protocols, and practices, such as 'the adequate operation of professional peer review, the sharing of empirical data, the open acknowledgement of errors, and openness about one's funders'. In some highly contested areas where science provides the basis of significant public policy, climate science certainly being among them, it also means conformity to *external* expectations of openness to the world outside the laboratory and 'responsiveness to the natural skepticism and desire for scrutiny of an educated public'.[78] Indeed if we look back to the birth of the experiment as a foundation of scientific practice in Restoration England, we can see that experimental philosophers (as they were then called) thought of the laboratory not just as a place where experiments with air-pumps could be conducted, but as a place where experiments in social order could be attempted. The community of experimental philosophers was presented as a 'model of the ideal polity' – a community without an arbitrary ruler, inhabiting a public space in which free men faithfully testified to the results of the experiments they witnessed, in order to produce useful and objective knowledge.[79] The authority of scientific knowledge has always been an effect of the politics, and not just the techniques, of its production.

The demand to explain the significance of our scientific method is also posed as a bureaucratic or managerial one. In a financial climate of austerity and shrinking research budgets, scholars in social sciences and the humanities have had to respond to threatened funding cuts by developing sophisticated public campaigns explaining the contemporary relevance, value, and utility of their research. The demand that academics demonstrate the continued relevance of their scholarship is also being posed by university administrators seeking to maintain high international rankings by managing the 'performance' of researchers. And it is perhaps funding bodies that

[75] Hulme and Ravetz, '"Show Your Working": What "ClimateGate" means', *BBC News*, 1 Dec. 2009.

[76] *Ibid.*

[77] *Ibid.*

[78] *Ibid.*

[79] S. Shapin and S. Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (1986), at 341.

most regularly pose the philosophical question (albeit in anti-philosophical terms): What is the social significance of your science?[80]

This address has questioned the desirability and the necessity of answering that question by drawing upon an ideal of science modelled on physics, or by attempting to demonstrate our capacity to produce theories that can generate a limited set of general laws. After all, the ideal of science as a method of reduction, coherence, and codification has never been uncontested. Even in the 19th century, debates raged in physiology about whether it was possible completely to reduce natural phenomena to fundamental principles or general laws. Today even the relative prestige of the hard sciences has weakened, with biology now being hailed as the 'so-called science of the future'.[81] The case-based method that characterizes biology can be witnessed in operation across a range of fields in which 'universal laws seem incapable of capturing the specificity and complexity of organisms, geological processes, or human productions'.[82] Even the Director of Financial Stability at the Bank of England has recently called upon financial analysts to model themselves on biologists – a sure sign that there has been a shift in the hierarchy of the sciences.[83] International lawyers might in turn rethink the commitment to drawing upon the hard sciences as an ideal for the 'task and method' of international legal scholarship.[84] I have suggested that it is timely to explore other – no less scientific – methodologies that might (that do) shape the work of professional legal scholars and our relation to the many realities that we seek to study and the many institutions and publics to which we are called to account.

Yet in returning to the historical debates out of which today's highly stylized versions of positivist and policy-oriented international law emerged, I have also stressed the necessarily contingent character of any privileging of different models or ideals of science. I have pointed to the institutional factors that shape the professional concerns and commitments of all scholars, and to the historical and geopolitical specificity of those concerns and commitments. Some of the most subtle and influential scientific innovators have been keenly aware of the limits of any given scientific method – both in terms of what it allows us to comprehend and what it enables us to communicate of that comprehension. A theory of scientific method is thus a theory of knowledge, and a theory of knowledge is a theory of language and its limits. This was after all the working premise that informed the extraordinarily creative group of thinkers and artists gathered in Kelsen's Vienna. As they recognized, all our scientific discoveries, theories, and models are themselves dependent upon language to communicate our comprehension of ourselves and of the world to each other, and to understand what

[80] To take just one example, the published assessment criteria for a recent round of Australian Research Council grants included the following: Does the research address a significant problem? Will the proposed research provide economic, environmental, social, health and/or cultural benefit to Australia? Will the proposed research be value for money? Is there a contribution to public policy formulation and debate?

[81] Creager *et al.*, *supra* note 3, at 4.

[82] *Ibid.*

[83] A.G. Haldane (Executive Director, Financial Stability, Bank of England), 'Rethinking the Financial Network', Amsterdam, Apr. 2009.

[84] Oppenheim, 'The Science of International Law: Its Task and Method', 2 *AJIL* (1908) 313.

someone else is trying to tell us. It is in this sense that, as Kelsen's circle saw, 'Science too is, at best, poetry'.[85] Perhaps then the most important lessons that international lawyers can learn from the history of science are the ongoing urgency of the question: 'what is the social significance of your science?', and the impossibility of answering that question once and for all.

[85] Janik and Toulmin, *supra* note 2, at 129.