PART I

Context and theory

1 Introduction

International adjudication

There is increasing commonality in the procedural rules that international courts and tribunals apply in relation to matters of proof and procedure.[1] This commonality may be explicable largely on the basis that international courts and tribunals essentially perform the same function as one another, but it is also due to the powerful intrinsic reasons for common practice, such as the perceived fairness and utility of the rules.[2] As reciprocal relationships among international courts and tribunals deepen and formalise, we are moving towards a time when they may potentially be viewed as forming part of the same court system.[3] The development of rules for the allocation of jurisdiction between tribunals may be the most important contributing factor.[4] However, increasing coherence in the handling of procedural matters indicates that informal relationships among courts are already building up at a systemic level.[5] Though there is no formal doctrine of precedent in international adjudication, courts and tribunals do look to one another's decisions for insight – on both substantive and procedural matters.[6] A 'community of international courts' is gradually forming.[7]

In this developing community, the impartial, reasoned and fair disposition of public international legal disputes has long been regarded as requiring considerable freedom for international courts and tribunals in relation to matters of evidence. An overarching emphasis has been placed on finding the 'truth' lying at the heart of an international

[1] Brown, *A Common Law*, p. 13. [2] *Ibid.*, p. 233.
[3] Shany, *The Competing Jurisdictions*, p. 106. [4] *Ibid.*, pp. 106–10
[5] Brown, *A Common Law*, p. 258. [6] Shahabuddeen, *Precedent*, p. 6.
[7] Brown, *A Common Law*, p. 258, noting Slaughter, 'A global community'.

dispute.[8] For this reason, international law knows little restriction on the admissibility of evidence, and the concept of the court's free evaluation of the evidence also prevails.[9] Accordingly, the focus of the discussions in this book lies more on matters associated with proof, rather than evidence as the field is known in the common law.

Little distinction need be made between the practice of international courts and the practice of international arbitral tribunals for the purposes of these studies, although a higher degree of technical specialisation amongst tribunal members is possible in the case of arbitration.[10] Perhaps the most relevant point of difference in regard to arbitral tribunals is that disputants usually have greater control over the procedure that is applied in an arbitration. The parties may therefore be more likely to take the initiative regarding decisions about such matters as the choice of procedures for putting expert evidence before the tribunal. The parties' level of control over the proceedings may also generate a different tone. However, the arguments and proposals canvassed in the chapters that follow generally apply equally to the practice of both judicial and arbitral tribunals. The challenges faced in dealing with science are similar, and the need to accommodate the precautionary principle should be recognised equally in either forum.

The cases discussed in the pages that follow present issues from a wide range of fields, revealing the contestability of scientific knowledge across different scientific specialisations, such as marine biology, nuclear technology, coastal geomorphology and endocrinology, to name only a few. They include cases where a disputant objects to another actor's activity because of the risks associated with the activity, and cases where a disputant objects to measures taken by another actor to protect itself against particular risks. For example, in resource-related disputes arising under the law of the sea complainants insist upon legal limitations to respondents' freedom to engage in

[8] Amerasinghe, *Evidence*; Sandifer, *Evidence*; Witenberg, '*Onus probandi*'; Brown, *A Common Law*, pp. 83, 85.

[9] Sandifer, *Evidence*, Chs. 1 and 4; Highet, 'Evidence and proof of facts', 358. See Iran–United States Claims Tribunal Final Rules of Procedure, 3 May 1983, 1 Iran–US CTR 57, Article 25(6); United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules 1976, www.uncitral.org, Article 25; ICSID Rules of Procedure for Arbitration Proceedings, *ICSID Convention, Regulations and Rules* (Washington: International Centre for the Settlement of Investment Disputes, 2006), Rule 33(1).

[10] Rosenne, *The Law and Practice*, p. 12. For wider discussion, *ibid.*, pp. 9–14.

disputed activities. In contrast, in the trade arena cases are lodged to defend exporters' freedom to engage in international trade, with arguments put forward insisting that there are no applicable legal limitations in relation to the exports in question. The arguments that will be made in the course of the book apply equally to both forms of dispute.

The rationalist tradition

The notion that it is a court or tribunal's task to apply the law to the facts forms part of what has been characterised in the West as the 'rationalist' tradition.[11] This tradition originated in the Enlightenment period, following the discrediting of the mediaeval method of trial by ordeal as a legal institution for determining the truth of a matter.[12] A rationalist approach to adjudication has sat well with the traditions of different domestic legal systems and is compatible both with standard liberal and socialist theories of law.[13] In the rationalist conception, fact and law are approached as distinct and separate. Rules governing evidence and procedure serve to help bring about 'rectitude of decision' through the 'correct application of valid law to true facts'.[14] Basic assumptions of the rationalist tradition view procedural law as facilitating this determination of true past facts as accurately as possible.[15] However, it is accepted that this may not always be possible, and rationalism is best understood as aspirationalist. The expectation of being able to determine the facts is the guiding principle.[16]

In disputes involving scientific uncertainty and potential future harm, international courts and tribunals are called upon to make judicial decisions in circumstances where potentially decisive facts about

[11] Twining, *Rethinking Evidence*. [12] *Ibid.*; Taylor, 'A comparative study', 185.
[13] Twining, *Rethinking Evidence*, pp. 199–200.
[14] Bentham, *Rationale*; Twining, *Rethinking Evidence*, p. 41; see also p. 423 on the empiricist tradition initiated by Bentham, Bacon, Mill, Jevons and Sidgwick. Bentham's work on the theory of adjudication has been described as the only sustained English-language attempt to produce a philosophical account of procedural law, with the exception of Fuller's work. Postema, 'The principle of utility and the law of procedure', 1393, citing Jeremy Bentham, 'The Principles of Judicial Procedure' in *Works of Jeremy Bentham*, II, pp. 1, 6. See also p. 1415. See also Anderson *et al.*, *Analysis of Evidence* pp. 78–84. Additionally, Jolowicz, *On Civil Procedure*, pp. 59, 86, 396; Stein, *Foundations of Evidence Law*, pp. 10, 56, 113 and 219–20; Fuller, 'The forms and limits'.
[15] Twining, *Rethinking Evidence*, p. 447.
[16] Often, rationalist theories about proof are concerned with the establishment of the approximate truth as a matter of probability. Twining, *Rethinking Evidence*, p. 76, point 4 and p. 273, point 12.

future events clearly cannot be obtained at the time of adjudication. While it may be disingenuous in other kinds of dispute to approach the rationalist tradition by interpreting its aspiration for certainty literally,[17] the situation is somewhat different in relation to a category of cases where the facts needed to decide a case are clearly unavailable. Here the concept of 'certainty' is to be taken literally: an absence of certainty has to be accepted from the start. This raises various tensions within the rationalist tradition.

Naturally, international legal rules are often crafted with scientific uncertainties already in mind, and as a result many international scientific disputes are governed by legal provisions involving mixed questions of scientific fact and law. For example, parties may be obligated to take all 'reasonable' measures to preserve the environment. Experts with detailed scientific knowledge will help adjudicators determine what can be considered 'reasonable'. In these cases, the usual rationalist distinction between fact and law may no longer so clearly prevail, and a clear-cut distinction between the role of an adjudicatory body and the role of experts advising a court or tribunal cannot be fully maintained. The scientific expert participates in the interpretative process carried out by the court or tribunal. Further, it becomes clear that the rules on burden of proof are not merely procedural in nature and can affect the outcome of a case. The application of the usual rules on burden of proof can lead to significant unfairness in a situation where scientific knowledge is simply not available. Additionally, the usual conclusive character of rationalist adjudication comes into question: if the science can change, how final should an adjudicatory decision actually be? In relation to all three of these sites of challenge within the rationalist tradition – expert evidence, burden of proof and the finality of adjudication – the degree of tension will depend partly on the specific legal rules at issue, especially the extent to which they have been designed to accommodate scientific uncertainty.

Proceduralisation and harmonisation in international law

In all of this, adjudication must be seen in a proper perpective. Adjudication is a tool for use in selected situations, and it is a highly

[17] *Ibid.*, p. 104.

rigid process that will not necessarily deal well with all aspects of scientific disputes. The substantive law governing international actors' relations with one another in relation to risks of potential future harm is gradually evolving in ways that take the emphasis off substantive determinations of rights through international adjudication. Increasingly, the international legal community deals with the need to mitigate risks and prevent environmental harm through a sophisticated network of international procedural obligations, found for the most part in multilateral environmental agreements.[18]

These obligations include requirements to obtain advance informed agreement or prior informed consent, such as in relation to transport of hazardous substances;[19] and requirements of prior notification, consultation and negotiation, such as in relation to shared watercourses.[20] By way of example, in one of the most well-known disputes, the *Lac Lanoux* case, the Arbitral Tribunal held that France was required to notify Spain of its intention to carry out work affecting the river's flow and to hear Spanish views.[21] Also included in the category of procedural obligations are general duties of co-operation, such as in respect of biodiversity[22] and under the United Nations Convention on the Law of the Sea (LOSC),[23] as well as general duties of consultation.

The requirements for risk assessment that dominate international trade law dealing with sanitary and phytosanitary risks also exemplify this growing focus on procedural obligations. Provisions requiring environmental impact assessments are central. Requirements to use the best available technology[24] or to design measures using the best

[18] On procedural obligations in customary international law, see Birnie *et al.*, *International Law*, pp. 126f, 559; Okowa, 'Procedural obligations', 317 f.

[19] For example, see the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Cartagena, 29 January 2000, in force 11 September 2003, 39 ILM 1027; the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Basel, 22 March 1989, in force 24 May 1992, 28 ILM 657; and the Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Rotterdam, 1988, in force 24 February 2004, 38 ILM 1.

[20] See the Convention on the Law of the Non-Navigational Uses of International Watercourses, New York, 21 May 1997, 36 ILM 719.

[21] *Affaire de Lac Lanoux* (Spain/France) XII UNIRAA 281 at 308.

[22] See the Convention on Biological Diversity, Rio de Janeiro, 5 June 1992, in force 29 December 1993, 31 ILM 818.

[23] United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982, in force 16 November 1994, 21 ILM 1261.

[24] For example, see the Convention on Long-Range Transboundary Air Pollution, Geneva, 13 November 1979, in force 16 March 1983, 18 ILM 1442.

scientific evidence available[25] may similarly be regarded as at least partly procedural. Obligations to comply with standards of due diligence and duties to prevent harm to other actors from hazardous activities[26] could also be considered to belong to the same family, although their substantive content remains apparent. Increased attention is being paid to the importance of public consultation, both in a state where a risk-generating activity is to take place and in an affected state.[27] Indeed, contemporary commentary on the precautionary principle emphasises that decision-making processes should involve public participation and deliberation.[28] The importance of collective consent to decision-making, and public trust in the responsible institutions has been emphasised.[29]

Procedural obligations form a vital part of international legal structures aimed at substantive outcomes, such as prevention and reduction of damage,[30] and their legal status is no less than that of substantive obligations: they are binding. It might be suggested that procedural obligations help fill the void in international risk regulation that corresponds to the activity of relevant executive and administrative bodies in domestic legal systems, by 'systemati[sing] co-operation'[31] between states. Procedural obligations enable situations of risk to be regulated with a degree of flexibility, over time, on the basis of ongoing interaction between international actors. As states devote more attention to fulfilling their procedural obligations, the likelihood and intensity of international litigation of disputes over potential future harm may diminish.[32]

[25] See LOSC, Article 119(1)(c). [26] Birnie *et al.*, *International Law*, pp. 137–50.
[27] For example, see Articles 2(2), 2(6), and 3(8) of the Convention on Environmental Impact Assessment in a Transboundary Context, Espoo, 25 February 1991, in force 27 June 1997, 30 ILM 802; Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus, 25 June 1998, in force 30 October 2001, 38 ILM 517.
[28] Fisher and Harding, 'The precautionary principle', 290; Cameron, 'The precautionary principle: Core meaning', 56.
[29] McDonell, 'Risk management', 190, 203; Wynne, 'Risk and environmental issues'.
[30] For example, Okowa observes the vital role of procedural obligations as practical underpinnings of 'aspirational and programmatic' principles of less clear legal status. Okowa, 'Procedural obligations', 334.
[31] *Ibid.*, 334.
[32] For further discussion, Stephens, *International Courts*, pp. 98–100. At the same time it has to be acknowledged that an emphasis on procedural obligations does not address the values at issue, and the need for normative criteria to resolve international environmental disputes appropriately in many instances. Koskenniemi, 'Peaceful settlement of environmental disputes'.

Proceduralisation operates in counterpoint with harmonisation, and both operate together with the precautionary principle.[33] Prominent among agreements emphasising harmonisation is the World Trade Organization (WTO) Agreement on Sanitary and Phytosanitary Measures (SPS Agreement).[34] The SPS Agreement offers a definition of harmonisation, as well as specifying that the international standards, guidelines and recommendations referred to in the Agreement are those of the Codex Alimentarius Commission, the International Office of Epizootics and those developed under the International Plant Protection Convention.[35] Harmonisation is not a phenomenon limited to the trade field. Reference might be made to the development of 'standards' of international environmental protection through multilateral agreements.[36] Standards emanating from the private sector may also have an effect within international law. For example, industry standards were used as a benchmark in assessing the production technology used at the Orion mill in the *Case concerning Pulp Mills on the River Uruguay (Argentina* v. *Uruguay)*.[37] From time to time actors will seek a higher level of protection than that offered by international standards. The difficulty with keeping international standards up to date with scientific developments has been recognised.[38] There may also be issues due to the fact that

[33] Obligations relating to consultation, the conduct of environmental impact assessments, and the sharing of information have been described by commentators as companion obligations to the precautionary principle. Handl, 'Environmental security', 76.

[34] Agreement on the Application of Sanitary and Phytosanitary Measures, WTO, *The Legal Texts: The results of the Uruguay round of multilateral trade negotiations*, p. 59. See also the Agreement on Technical Barriers to Trade, *ibid.*, p. 121.

[35] SPS Agreement, Annex A paras. 2 and 3. For background, Victor, 'The SPS Agreement'.

[36] For example, see *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, Complaint by India (WT/DS58), Complaint by Malaysia (WT/DS58), Complaint by Pakistan (WT/DS58), Complaint by Thailand (WT/DS58), Report of the Panel DSR 1998: VII, 2821, paras. 7.52, 7.55.

[37] *Case concerning Pulp Mills on the River Uruguay (Argentina* v. *Uruguay)*, Judgment of 20 April 2010, ICJ Reports 2010 paras. 223–5.

[38] See *EC – Asbestos* where the EC argued that advances in science could 'render an international standard ineffective or inappropriate'. *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products*, Complaint by Canada (WT/DS135), Report of the Panel DSR 2001: VIII, 3305 paras. 3.374, 3.375. The EC noted that the North American Free Trade Agreement (NAFTA) allowed specifically for this. NAFTA Article 905(1): 'Each party shall use, as a basis for its standards-related measures, relevant international standards or international standards whose completion is imminent, except where such standards would be an ineffective or inappropriate means to fulfil its legitimate objectives, for example because of fundamental climatic, geographical, technological or infrastructural factors, *scientific justification* or the level of protection that the party considers appropriate.' Emphasis added. *Ibid.*, para. 3.374.

international standards are not always equally applicable in all environments.[39] However, generally, increased harmonisation over time can, like the greater use of procedural obligations, be expected to reduce the scope for disputes over risk-response measures.

In tandem with these trends, increasing international acceptance of the precautionary principle as an appropriate and justifiable basis for decisions in situations of risk and scientific uncertainty will also reduce friction between international actors over activities involving risks. Despite these positive trends, however, it is clear that the adjudication of international disputes will continue to require international courts and tribunals to grapple with the hard science.

The nature of scientific knowledge

Scientific disputes must be adjudicated in the knowledge that all scientific assertions are subject to the possibility of being discarded should they prove to be false.[40] This dedication to empiricism is a signature feature of scientific method. Today's 'minority science' could become tomorrow's 'mainstream science'.[41] Further, science is profoundly social.[42] What we know as an 'invulnerable core of scientific knowledge' ultimately consists of scientific claims that no scientist any longer challenges.[43] This is important in the context of scientific disputes. The interface between science and law generates changes in the dynamics of what will pass for scientific knowledge and expertise. All involved need to be aware of the social and legal construction of scientific knowledge and scientific expertise, as well as their fragility in sceptical legal contexts.[44]

The 'systematic and formulated knowledge' on which we rely to interpret the natural world is recognised within the discipline in which it is developed as contingent. Scientific hypotheses and assertions are formulated and adopted in the light of focused observations, measurements and modelling. The design and execution of the studies on which they are based, and the quality of their analyses, are subject to vigorous peer review. These hypotheses and assertions are then permitted to prevail, based on their merits and the understanding that they could later be superceded by alternative hypotheses and assertions. However,

[39] See below, Ch. 4.
[40] Popper, *The Logic of Scientific Discovery*. See also Popper, *The Myth of the Framework*.
[41] Kuhn, *The Structure of Scientific Revolutions*. [42] *Ibid.*
[43] Jasanoff, 'What judges should know', 349. [44] Smith and Wynne, 'Introduction', 12.

differences of view among scientists as to the validity of hypotheses and assertions can be expected to remain indefinitely in varying degrees. Differences may be due to numerous specific factors, such as the ways in which samples are selected, variables chosen, methods of measurement employed, models adopted and causal inferences drawn.[45]

As in other fields of research, the scientific mainstream has an inherent pull. Prevailing perspectives influence the scope of contemporary scientific research, as well as scientific methodology and working assumptions.[46] Research funding structures and constraints are among the more overt determinants of the parameters of scientific development, but less obvious influences must also be taken into account. There are disciplinary efficiencies in according ready acknowledgement to work carried out by known and respected researchers, or within the frameworks that have been established by their work. New work, or radical assertions and hypotheses, will be subject to more intense review, and publication may be more difficult.[47] Yet recognising the potential value of new science is important. On various occasions in recent history, developments in technical and scientific understanding have revealed fatal and pernicious errors in relation to the safety of particular products and practices. Well-known examples include the use of asbestos, thalidomide and ozone-depleting substances.[48]

Scientific uncertainties permeate the evidence in the type of case under study in this book. It is the task of international courts and tribunals to come to terms with the science in order to dispose appropriately of the cases that come before them. For the purposes of the discussions that follow, we can say that there is 'scientific uncertainty' where reputable scientists agree that further research needs to be carried out on a particular question, or their disagreement on issues germane to a dispute makes it clear this is so.[49]

[45] Fraiberg and Trebilcock, 'Risk regulation'; Hickey and Walker, 'Refining the precautionary principle', 408.
[46] Kuhn, *The Structure of Scientific Revolutions*.
[47] Peel, *The Precautionary Principle*, p. 131.
[48] Harremoës *et al.*, 'Twelve late lessons', 185 – 215.
[49] Wynne, 'Uncertainty and environmental learning', 111–27. Alternatively, see von Schomberg, 'The precautionary principle', 29. See also Stirling, 'The precautionary principle', 80. It is important also to acknowledge potential ignorance, where 'we do not know what we do not know'. Wynne, 'Uncertainty and environmental learning', 111–27; See also Harremoës *et al.*, 'Twelve late lessons', 187; McDonell, 'Risk management', 190.