Additional comments and attached paper submitted by Bernard D. Goldstein, 9/13/2019.
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Years ago Russellyn Carruth and I did a paper in *Risk Analysis* critiquing the way the World Trade Organization obtained scientific advice, which was to solicit individual expert opinions. I believe this relatively broad-ranging critique is pertinent to the current processes recently adopted for the SAB. In particular, it discusses the relative advantages to addressing complex scientific issues through obtaining a consensus opinion from appropriately selected experts.

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Risk Analysis, Vol. 24, No. 2, 2004

The *Asbestos Case*: A Comment on the Appointment and Use of Nonpartisan Experts in World Trade Organization Dispute Resolution Involving Health Risk

Russellyn S. Carruth[1] and Bernard D. Goldstein[2]*

The World Trade Organization is currently evolving its approach to incorporating scientific and technological evidence into its dispute-resolution process. In *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products*, the Panel was faced with a large amount of complex and conflicting scientific evidence presented by the partisan experts. The *Asbestos* Panel's solution was to appoint independent, nonpartisan experts to help it understand and evaluate the scientific evidence. While this was far better than trying to unravel the conflicting scientific evidence on its own, two aspects of the Panel's adopted procedure merit scrutiny. First, the expert-selection process used by the Panel may not assure that the collective expertise of the appointed experts is broad enough when the dispute involves multidisciplinary scientific issues. Second, the process adopted by the Panel for consulting the appointed experts—which involved individual consultation rather than a consensus process—may leave a panel with a distorted or confused picture of the science. A consensus approach is the best means of obtaining scientific advice from appointed experts; it is most calculated to provide a clear and accurate report of the scientific information needed by a panel to make a fair and informed decision on the dispute before it. The underlying principle of world trade agreements is that it is beneficial to all of us to have free trade. Among other things, this requires an effective means of resolving disputes, and increasingly that includes disputes involving complex scientific and technological issues. This can be achieved only if the parties have confidence that their disputes will be decided in a fair and informed manner, based on the best science available. To achieve this goal, we suggest that future WTO panels depart in certain respects from the procedures utilized by the *Asbestos* Panel.

KEY WORDS: Consensus; dispute resolution; nonpartisan experts; World Trade Organization

1. INTRODUCTION

The purpose of this article is to examine and critique the *Asbestos Case* as a model for how World Trade Organization (WTO) dispute-resolution panels obtain impartial scientific input for their decision processes, particularly concerning health risk. As globalization increases and multinational trade becomes more important to national economics, so does the importance of the WTO as a mechanism for adjudicating trade disputes among its members. The credibility of the WTO dispute-resolution process in cases involving complex scientific issues is dependent upon the Panel's marshaling and applying the best scientific evidence.

In 1998, Canada challenged a French ban on asbestos and asbestos-containing products as violative

[1] University of Pittsburgh School of Law, Pittsburgh, PA, USA.
[2] University of Pittsburgh Graduate School of Public Health, Pittsburgh, PA, USA.
* Address correspondence to Bernard D. Goldstein, Dean's Office, University of Pittsburgh Graduate School of Public Health, A624 Crabtree Hall, 130 DeSoto Street, Pittsburgh, PA 15261, USA.

0272-4332/04/0100-0471$22.00/1 © 2004 Society for Risk Analysis

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of trade agreements, including the General Agreement on Tariffs and Trade (GATT). A panel was established by the WTO Dispute Settlement Body to hear the case, which was denominated *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products* (herein referred to as the *Asbestos Case*). For our purposes, the key issue was whether the available scientific evidence regarding the health risks of asbestos justified banning asbestos for the sake of public health. The panel found that there was sufficient scientific evidence to justify a ban on asbestos as a public health measure, and it upheld the French law on that basis. This finding was appealed by Canada, but it was upheld by the WTO Appellate Body.

In reaching this key decision, the *Asbestos* Panel observed that, in situations where scientists disagree, it is not the Panel's role to decide which among competing scientific views is the correct one.[3] Rather, the Panel's task is to determine whether there is sufficient scientific evidence to justify a reasonable public health official in adopting a particular measure for the protection of public health[4] (See Reference 1, paras. 8.181–8.182). While this decision-making role of the Panel may be viewed as a limited one, it is nonetheless important that the decision be based on the best available science.

The Panel in the *Asbestos Case* expressly recognized that the dispute involved complex and wide-ranging scientific issues and evidence. As a result, the Panel decided to appoint scientific experts, as had been done by WTO panels in the past,[5] to assist it in understanding and assessing the scientific evidence presented by the parties[6] (See Reference 1, para. 8.80. See also para. 8.10). We strongly support the use of appointed, nonpartisan experts to assist the decision maker with complex scientific evidence and issues. However, we believe the approach used in the *Asbestos Case* was not optimal for the goal of providing the best available science. Our paramount concern is that the procedure followed in the *Asbestos Case* foreclosed any opportunity for resolving differences and obtaining consensus among the appointed experts. We believe that the consensus approach is the best method for appointed, nonpartisan experts to provide a WTO panel with the best available science, and thus the most effective to assist in making a fair and informed decision.

We want to emphasize that we agree with the *Asbestos* Panel's ultimate decision—an overwhelming majority of scientists and public health experts would agree there is sufficient evidence of adverse health effects of asbestos to single it out for restrictive regulation. This absence of debate over the outcome makes it particularly useful and important to examine the process adopted by the *Asbestos* Panel, because this case sets a precedent that future panels may follow. Because of that potential precedential influence, we offer the following critique and suggestions for the consideration of future panels in cases involving enough scientific or technical complexity to warrant appointment of nonpartisan experts. In particular, we urge future panels to foster a consensus approach by appointed experts in order to obtain the best available science.[7]

2. OVERVIEW OF THE *ASBESTOS CASE*

In 1996, France adopted a decree banning, with few exceptions, the importation and use of asbestos and asbestos-containing products, for the stated purpose of halting the spread of asbestos-related death and disease.[(2)] As an exporter of chrysotile asbestos, Canada challenged the French ban, *inter alia*, under Article III:4 of the GATT, which prohibits discrimination against "like products" of another GATT country. The thrust of Canada's argument was that chrysotile asbestos (which was banned) and cellulose and other substitute fibers (which were not banned) constitute "like products" within the meaning of Article III:4. Therefore, banning one and not the others was, Canada argued, a violation of the anti-discrimination rule.[(3)]

The European Community (EC) in defense of the French ban, responded with a two-pronged defense. First, the EC argued that the ban was not discriminatory because, due to the significant difference

[3] "[T]he Panel does not intend to set itself up as an arbiter of the opinions expressed by the scientific community."

[4] "Its role . . . is to determine whether there is sufficient scientific evidence to conclude that there exists a risk for human life or health and that measures . . . . are necessary in relation to the objectives pursued."

[5] For a helpful overview of WTO cases in which experts have been appointed, and relevant issues, see Pauwelyn, "Expert Advice in WTO Dispute Settlement," this volume.

[6] "The Panel also notes the extreme factual and scientific complexity of this case, which led to the consultation of experts . . ."

[7] We are not suggesting that the consensus approach in particular or appointed experts in general supplant the more traditional rights of parties to present partisan expert evidence, cross-examine adverse experts, and the like. We are simply urging that, in cases complex enough to warrant appointment of multidisciplinary nonpartisan experts, a consensus approach will be most effective to derive the best scientific input from those appointed experts.

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in health risk, chrysotile asbestos and the substitute fibers were not really "like products."[4] Second, even if discriminatory under Article III:4, the EC argued that the ban was allowed under Article XX(b) of the GATT, which makes an exception for qualifying internal regulations "necessary to protect human . . . life or health."[5]

Canada responded with its own two-pronged argument. First, Canada asserted a legal argument that health risk is not a proper factor to consider in the "like products" analysis under Article III:4. Second, Canada made a factual argument that there is not detectable risk from modern chrysotile products. Specifically, Canada asserted that the scientific data establishing that asbestos causes adverse health effects, such as mesothelioma and lung cancer, pertained to amphiboles, the particular type of asbestos formerly in widespread use in friable form, and not to chrysotile, a different type of asbestos fiber. Canada further argued that in modern products, such as chrysotile cement products, the fibers are bound in a compacted matrix, thus eliminating any risk of inhalation exposure. Moreover, Canada asserted, modern specialized tools and techniques, referred to as "controlled use," also protect against inhalation exposure.[6]

Canada drew two conclusions from its factual argument that chrysotile does not pose a health risk. First, even if health risk is an appropriate factor to consider in the "like products" analysis, there is no discernable difference in risk between chrysotile asbestos and the substitute fibers; therefore, France's ban constituted discrimination between "like products" in violation of Article III:4. Second, banning a product that does not pose any health risk cannot reasonably be considered necessary to protect human health; therefore, the ban could not qualify under the Article XX(b) exception for measures designed to protect human life and health.[7]

In response to Canada's factual argument, the EC counter-argued that the scientific literature establishing the adverse health effects of asbestos was indeed applicable to chrysotile asbestos, and in fact that chrysotile asbestos was a known carcinogen.[8] Further, the EC argued that cement-bound products often had to be cut during construction or repair, thus freeing fibers and creating inhalation exposure. Moreover, the EC argued that so-called controlled use did not protect effectively against these health risks, especially for workers "downstream" from the mining and manufacturing industries, such as plumbers and electricians engaged in maintenance or repairs, and especially for amateur do-it-yourselfers. Indeed, frequently such downstream workers might not even be aware that the structure they were working on contained asbestos.[9]

The parties presented extensive conflicting scientific evidence to support their respective positions. Faced with this complex and conflicting evidence, the Panel decided to appoint experts of its own to assist it in understanding and assessing the scientific evidence. Through an iterative process with the parties, the Panel identified the following disputed scientific issues on which to consult the appointed experts: the nature and frequency of exposure to chrysotile asbestos; the relative health risks associated with chrysotile asbestos versus substitute fibers; proper risk assessment for low-dose exposures; and effectiveness of controlled use.[10]

After reviewing the scientific evidence of the parties and the input from its appointed experts, the Panel made the following key factual findings. Chrysotile asbestos is a known carcinogen that causes both mesothelioma and lung cancer.[11] The substitute fibers at issue are not known carcinogens; while their health effects are uncertain, the established risks are less than for chrysotile.[12] There is inhalation exposure to chrysotile asbestos fibers even with modern cement-bound products, because those products often have to be cut during construction to make pieces fit, or during maintenance, repairs, or remodeling by "downstream" workers such as electricians, plumbers, and do-it-yourselfers.[13] There is no known threshold below which chrysotile has been shown not to be carcinogenic; even small-dose exposures may carry a risk of cancer. In the absence of data, the appropriate approach to extrapolate risk from low doses is a no-threshold, straight-line dose-response curve.[14] "Controlled use" regulations cannot fully protect against asbestos risks, in particular because they are difficult or impossible to enforce among downstream workers, and many workers may not even be aware there is asbestos present.[15]

The Panel found that the French ban discriminated against "like products" in violation of Article III:4 of GATT.[16][8] However, the Panel concluded

[8] The Panel's conclusion rested on its decision that health risks were not a proper factor to consider in the "like products" analysis under Article III:4. Even though the Panel ultimately ruled in the EC's favor, upholding the French ban under the Article XX(b) exception for measures to protect human health, the EC nonetheless appealed the Panel's interpretation of Article III:4. On appeal, the Appellate Body rejected the Panel's interpretation, holding that health risk is an appropriate factor in the "like products" analysis (See Reference 3, paras. 113 and 192(b)).

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that the ban qualified for the exception under Article XX(b) as a legitimate measure "necessary to protect human . . . life and health."[17] Accordingly, the Panel upheld the French ban.

3. SELECTION OF AND CONSULTATION WITH APPOINTED EXPERTS IN THE *ABESTOS CASE*

3.1. Selection of the Appointed Experts

The Panel invited the parties' input as to the criteria for and selection of experts, including the disciplines that should be represented. Canada identified the disciplines of toxicology, epidemiology, risk analysis, and occupational health as required to adequately address the issues in the case.[18] The EC was less specific regarding disciplines, but requested specialists in lung cancer and mesothelioma and epidemiologists experienced in the area of asbestos and cancer. While expressing uncertainty as to what discipline would encompass "risk evaluation and management in the use of chrysotile" and "the effectiveness of controlled use of chrysotile," the EC felt experts were needed who could provide information about all the categories of persons who could come into contact with asbestos and asbestos-containing products, including "downstream" workers, and about the inspection of houses, buildings, and factories for the presence and possible removal of asbestos. EC requested designation of at least two experts "for each scientific domain and each area of questions" for a balanced view, and in any event no fewer than six experts in all.[19] Canada asked that each question be submitted to more than one expert,[20] but did not specify how many experts should be appointed. Canada did not oppose the EC's request for a minimum of six experts. While these wish-lists from the two parties were not identical, they overlap a fair amount, and the Panel Report does not reflect that either side objected to any suggestions of the other.

While the parties were essentially in agreement about the required expertise and number of slots for appointed experts, there was obviously controversy as to who should fill those slots. When the Panel asked for suggestions of entities to propose names of potential candidates the parties submitted two lists that were almost mutually exclusive. Canada advocated seeking nominations from the World Health Organization (WHO), the International Labor Office (ILO), and the International Organization for Standardization (ISO). The EC advocated that the experts be drawn mainly if not exclusively from the International Agency for Research on Cancer (IARC), and possibly from ILO if IARC could not cover all the areas in question, but not from the ISO.[21] The Panel, Solomon-like, decided to request nominations from WHO, ILO, ISO, and the International Program on Chemical Safety (IPCS), as well as from the parties themselves.[22]

The parties also expressed disagreement about qualifications related to potential conflict of interest. The EC insisted that the experts should not be citizens of the parties, should not have any ties to the asbestos or "controlled use" industries, and should be required to demonstrate the absence of any conflict of interest.[23] Canada argued that hard and fast exclusions could eliminate the most knowledgeable experts, that exclusion of industry-linked experts but not those with links to anti-asbestos pressure groups would be questionable, and that it was incumbent on experts only to fill out disclosure forms, not to prove impartiality.[24] The Panel decided that it would not appoint any citizens of a party unless either the parties consented or the Panel concluded it would otherwise be impossible to get the specialized advice needed.[25]

Once names of proposed experts were received from the nominating organizations, the Panel obtained curriculum vitae from each nominee and distributed them to the parties. The parties were given the opportunity to submit any "comments or major objections." At that point the iterative process abruptly ended, and the Panel announced the appointment of four experts to whom neither party had objected.[9]

There is no indication in the Panel Report that the parties were given any opportunity for further input in the selection process, including the opportunity to

[9] The Panel's appointment of only nonopposed experts might be interpreted as giving the parties veto power. However, we find no persuasive support for such an inference in the Panel Report; in particular, we do not read paragraph 5.8 as suggesting any such intent on the Panel's part. A more likely interpretation is that the Panel's decision to appoint only unopposed experts was a Solomon-like move intended to avoid grounds for appeal. In this it was successful. One of Canada's arguments on appeal was that the appointed experts lacked expertise in the area of "controlled use." The Appellate Body rejected this argument, pointing out that the experts were selected in consultation with five experienced institutions, and that none of them were opposed.[26] The Appellate Body's rationale begs the question to some extent, since no individual expert was expected to have expertise in all areas involved in this multidisciplinary inquiry. Under these circumstances, it does not make sense to expect Canada to have objected to any individual nominee on the ground that he or she did not have expertise in "controlled use."

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comment on whether the breadth of expertise provided by the four appointees collectively was adequate to cover the relevant areas of inquiry. The Panel itself offers no comment on the adequacy of coverage. Nor does the Panel give any explanation of why it appointed only four experts instead of a larger number as requested by the EC and implicitly concurred in by Canada.[10]

3.2. Consultation with the Appointed Experts

From its first announcement that it intended to appoint nonpartisan experts, the *Asbestos* Panel expressed its inclination to consult those experts individually.[(27)] Canada agreed that each expert should be consulted individually.[(28)] The EC, however, strongly advocated that the appointed experts be consulted as a group.[(29)] When the Panel persisted in its original plan, the EC demanded that the Panel provide explicit substantive reasons for its decision to consult the appointed experts individually rather than collectively.[(30)] In apparent response to this pointed challenge, the Panel cited the multidisciplinary nature of the scientific inquiry as a reason to consult the experts separately:

> In view of the wide variety of fields of competence involved, in particular, it appeared to us to be preferable to obtain different information and opinions individually rather than requesting a joint report on the various scientific or technical issues raised.[(31)]

This is the Panel's only written rationale for its decision to consult the experts separately rather than seeking a consensus report.[11]

The Panel, with input from the parties, developed a list of written questions for the experts pertaining to the areas of inquiry previously identified. In accordance with its decision to consult the appointed experts individually, the Panel submitted the questions to each expert separately and asked each of them to provide written answers. Each expert received all the questions and was asked to reply to those "within his sphere of competence and, if necessary, to indicate the areas on which he does not feel competent to reply."[(32)] The Panel also asked the experts to indicate, to the extent possible, key points on which there is (1) scientific proof, (2) broad agreement among experts, and/or (3) uncertainty and/or a range of divergent opinions among experts.[(33)]

Each expert's written answers are reproduced in the Panel Report.[(34)] There was remarkable variance among the four appointed experts with respect to the length of their responses, the depth of analysis and explanation, and whether the responses were supported by references to the scientific literature.[12] The relative length of the experts' replies formed a definite pattern that generally held true regardless of subject matter, suggesting that it may have been attributable to a lack of clarity in the instructions rather than any difference in the experts' respective expertise. The most voluble of the experts also submitted, on his own initiative, a 40-page "introduction" intended to give a general summary of prevailing knowledge and uncertainties on asbestos-related disorders with related discussion.

Almost every question was answered in some fashion by each expert, although their understanding of the questions or the thrust of their answers sometimes differed. There were very few points, that any of the experts declined to answer due to lack of expertise. Only one of the four experts made an effort to routinely distinguish the degree of unanimity or divergence of scientific opinion. Moreover, on some questions where that expert thought there was general unanimity in the scientific community, his substantive opinion was contrary to that of one or more of the other experts.[13]

Once the experts' written answers were received, the parties were permitted to file written comments.[(35)] Because the experts' answers generally favored the EC's position, Canada's comments were more voluminous and geared toward damage

[10] The appointees were three Australian academics whose titles indicate they are in pubic health, anatomical pathology, and respiratory medicine, and one American epidemiologist. The Panel Report did not elaborate on their areas of expertise.

[11] Most of the published record pertaining to this dispute is devoted to the legal question of whether the Panel had authority to consult experts individually, or only as a group.That legal dispute is beyond the scope of this article, and we will assume for present purposes that the Panel was correct in deciding that it had discretion to consult individually. What concerns us is whether the decision to consult the appointed experts individually rather than collectively was a poor precedent for the future, which is discussed in Section 4 of this article. It should be noted that, because the appointed expert reports generally favored the EC's position, and the Panel ultimately decided in the EC's favor, the Panel's decision to consult experts individually was not challenged on appeal.

[12] For example, in response to the first question, the longest answer was two pages single-spaced; the shortest, eight lines.

[13] See, e.g., paras. 5.185–5.191, 5.264–5.267. This suggests either that the first expert was incorrect in believing that there was no dispute in the scientific community or else that the question was understood differently by the various experts.

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control. The Panel had reserved to itself discretion to decide whether a face-to-face meeting would be held between the parties and experts at this point. The Panel in fact opted for such a meeting, which was held on January 17, 2000.[36] In anticipation of the meeting, the Panel provided each appointed expert with the parties' written comments regarding the expert reports. The most voluble of the experts, again on his own initiative, submitted a 17-page supplement pertaining to those comments prior to the meeting.

From the start of the January 17, 2000 meeting, the Panel chairman made it clear that this meeting, which would last the one day only, was the final opportunity for participation of the appointed experts in the case.[37] The meeting was large, including the three-member panel supported by two staff members and two legal officers, the four experts, and large delegations from each party, consisting of government officials, legal advisors, and partisan experts.[14] The procedural format was rather cumbersome. Each speaker had to be formally recognized by the chair before speaking.[15] The representatives of each party took turns posing questions, which resulted in a fair amount of jumping around. The parties' representatives were also permitted to make fairly lengthy and argumentative comments that decreased the time available for questioning the experts. Each question from the parties could be answered by any one or more of the four experts. However, the experts were not given any meaningful opportunity to establish their own agenda or to discuss the scientific issues and literature among themselves. In short, the format of the meeting permitted neither a collective search for consensus among the experts nor effective cross-examination by the parties.[16]

3.3. Critique of the Process for Selection and Use of Appointed Experts in the *Asbestos Case*

The most noteworthy feature of the consultation process in the *Asbestos Case* was the absence of a consensus approach. It is the view of the authors that, where respected experts are charged with determining complex and uncertain scientific issues, a consensus approach is most likely to produce the closest approximation to current scientific understanding and to provide the most useful answers to a specific charge from the Panel.

The goal of basing socially important decisions on the best available science is a universal one that is shared by numerous deliberative bodies. Good science is essential to effective regulatory agency decisions related to human health and the environment. Good science is also sought by judicial bodies, which must make decisions running the gamut from toxic tort suits to international trade agreements, as in the present case. Inherent in just about all of these decisions is the need to rely on a snapshot of available scientific knowledge at the same time the decision must be made, without the luxury of waiting for eventual resolution of the scientific uncertainties. In the face of scientific uncertainty, the prevailing opinion of the informed scientific community as a whole—i.e., current scientific understanding—is more likely to predict the eventual scientific truth than is the opinion of any single scientist, no matter how distinguished. While there is no question that on numerous occasions informed scientific opinion has in time proven erroneous, the direction of the error is clear only in retrospect, and the likelihood of significant error is less than relying on any individual opinion.

On many issues of scientific uncertainty, particularly where there is a robust body of scientific evidence as there is for asbestos, a snapshot of opinions in

[14] The two partisan delegations together totaled approximately 30 people.

[15] The chairman noted that this would permit him to announce clearly who is speaking each time, for purposes of having a clear transcript. The proceedings were tape-recorded, presumably by a staff member, for subsequent transcription. One shortcoming is that, every time one tape ended and a new tape was inserted, there are gaps in the transcript. Another shortcoming, even more serious, was the delay of a month in transcribing the proceedings—a delay that was apparently routine and anticipated.This meant that the transcript was not available for purposes of a substantive meeting between the Panel and parties that started three days later. These problems could easily have been avoided by use of a professional court reporter, as is done for even the smallest slip-and-fall cases in the American litigation context. Even allowing for translation and editing, it is inconceivable to an American litigator that the parties should wait a month for a 70-page transcript (with gaps) in a case of this magnitude, when a transcript (without gaps) could have been produced overnight by a certified court reporter for a cost in the range of perhaps $1,000.

[16] A review of the transcript suggests that the January 17, 2000 meeting was an ineffective use of WTO resources and of the experts' (and everybody else's) time. For example, after the introductions and formalities, there was time for only three questions and answers before the first coffee break. An inordinate amount of time was taken up by commentary from the representatives of the parties that was often argumentative and occasionally frivolous, e.g., the suggestion by one representative that he would desist from further discussion on controlled use "in the overriding interest of not missing my evening cocktail" (Annex VI, p. 185). Indeed, the fact that the transcript of a full-day proceeding is only 70 pages long in itself indicates a rather ponderous pace.

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the informed scientific community can be envisioned as forming a typical bell-shaped curve. Most scientists will be clustered in the center, with gradually decreasing numbers as the curve stretches to the outer poles of respected opinion. As a generalization, there are two approaches to eliciting current scientific opinion: consensus and confrontation. The consensus approach is designed to examine and synthesize the full breadth of the bell-shaped curve, to explore the potential for maximizing agreement and narrowing differences. The confrontational approach, by contrast, is designed to emphasize differences.

The consensus approach, as commonly used by scientific societies and academies, involves selecting a committee of respected experts who then engage in a review of the literature and its scientific interpretation.[38,39] The product is often a scholarly review but can be a reply to a specific well-formulated question or series of questions related to a societal issue. Committee members are chosen for their scientific expertise in the disciplines pertinent to the science issues under review. In many cases, such as the committees of the U.S. National Research Council of the Science Advisory Board of the U.S. Environmental Protection Agency, there is a conscious attempt to balance potential biases. Balance might be sought through including reputable scientists from both industry and a citizen's group on a committee considering issues involving the potential risk of an environmental pollutant. The desire for balance also typically results in the selection of scientists from a variety of points across the bell-shaped curve. In almost all such processes, there is the opportunity for a minority report, but often any minority opinion is included within the committee document by describing both opinions and discussing the reasons for the differences and relative strength of each view among the informed scientific community.

The confrontational approach classically occurs in a courtroom in which both sides call their own experts with the intention of supporting opposing views. In this context, the two litigants choose their respective experts from the opposite poles of the bell-shaped curve.[17] The two scientific camps do not meet to discuss the matter, and their opinions, often in writing, are elicited and subjected to cross-examination in a formal courtroom process that tends to heighten the differences between them. One inherent reality of the courtroom process is that the decision maker, listening to the testimony of the opposing experts, usually has no way of knowing that a bell-shaped curve even exists. It is not in the interest of the litigants to elicit a nonpartisan snapshot of existing scientific opinion. For all the judge and jury can tell, scientific opinion seems to be completely divided in two irreconcilable camps, each claiming to be correct.

When the scientific issues are sufficiently complex, and where resources permit, courts and other adjudicative bodies sometimes appoint nonpartisan experts to assist in understanding the prevailing science, in order to help evaluate the scientific evidence in the case. This is what the *Asbestos* Panel set out to do. But for reasons that are difficult to understand, it chose to consult the four appointed experts individually rather than using the consensus approach. As a result, it ended up with four separate views from random points along the bell-shaped curve. This was an improvement over the litigation model in that the appointed experts were nonpartisan and did not come from the extreme poles of the curve. But individual consultation falls short of the consensus approach in its ability to provide a clear, synthesized statement of the best available science. In this article we do not address the legal authority of the Panel to consult experts individually, but rather the wisdom of doing so (see footnote 8). For reasons we will elaborate on below, we believe a consensus approach is particularly valuable in this context, where the intended recipients are nonscientists.[18]

Scientists are accustomed to participating on consensus committees designed to pool their expertise to review and evaluate current scientific knowledge. Consensus formation is inherently iterative. By jointly discussing the literature and sharing interpretations, scientist hone their understanding and may reach a better opinion than the sum of the parts. In consensus meetings there is often a deference to the acknowledged expertise of others, and a willingness to modify

[17] There is a large body of case law and legal literature dealing with a perceived problem of "junk science"—i.e., the espousing of partisan scientific opinions outside the bell-shaped curve of respected scientific opinion. That issue is beyond the scope of this article.

[18] We recognize that peer review, another well-established approach utilized to evaluate scientific information, relies on individual opinions. In the standard peer review of manuscripts submitted to scientific journals, two or more individual experts in the field are asked to submit written critiques without any consultation among themselves. However, this differs from the WTO process in that the editor is a highly knowledgeable member of the scientific community chosen on the basis of the ability to exercise judgment in the choice of reviewers and in the interpretation of the reviews.

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opinions in the face of persuasive arguments. These are among the forces that tend to bring scientists closer together under a consensus framework. These aspects of sharing knowledge and perhaps resolving differences to some degree are lost when scientists are consulted individually.

The *Asbestos* Panel explicitly acknowledged the extraordinary degree of scientific complexity involved in this case and cited this as its reason for appointing its own experts. The Panel also acknowledged that the scientific issues in the case involved multiple disciplines. Indeed it was this multidisciplinary aspect that the Panel cited as the reason for its decision to gather individual opinions rather than seeking a collective report. In our view, however, the multidisciplinary nature of the inquiry makes a consensus approach more—not less—important. Scientists are accustomed to participating in consensus committees or other groups that are multidisciplinary in nature. They are able to understand each other, to evaluate the contributions from the various disciplines, and to synthesize those contributions far better than a lay panel can.

This leads to another benefit of the consensus approach: it is designed to produce a coherent, single report from the experts jointly, synthesizing their expert knowledge and opinions, including any disagreement among them. Divergent opinions among the scientific community will be discussed and evaluated in the expert committee report, supplemented if necessary by a minority report. Such a consensus report effectively conveys the best possible science for the panel's use. Here, however, it was up to the Panel to pick and choose among a collection of disjointed individual comments, both written and oral. There were occasional disparities among the experts' answers and, more commonly, there were differences in focus or emphasis. Where there were disparities and differences, the Panel had to decide how much weight to give to which answer. Moreover, as noted above, there was a significant variance between individual experts as to length and breadth of their answers, which could be mistaken by lay panelists as indicating a difference in degree of expertise, and thus distort the weight given. The Panel was fortunate that there was much agreement in this case. But this was not known in advance, and it won't always be so. A panel of nonscientists is much less qualified to weigh and synthesize multiple opinions than the scientists themselves acting in consensus fashion. By consulting the experts individually, the Panel ended up having to do the very thing it set out to avoid—choosing between differing scientific opinions.

Another problem in the *Asbestos Case* is that the questions (both written and oral) provided a rigid and awkward framework for discussing the issues. Comments from the experts, the repetitiveness of some of the answers, and the differing ways in which the experts interpreted some of the questions all suggest that the questions were not well formulated. The significant variance between individual experts as to length and breadth of their answers also suggests some degree of confusion over the Panel's instructions. This is not surprising. It is difficult for a lay panel to understand complex scientific issues well enough to formulate the right questions. Problems of this nature can be ameliorated through a consensus approach. Give and take among the scientists can help to better interpret questions and to determine how much depth is needed for a good answer. Moreover, a consensus committee will more readily engage in give and take with the panel itself (or its staff) to clarify what the panel really needs.[19]

Because the health risks of asbestos are well documented in the literature, there was relatively little

[19] It is impossible to develop a recipe for questions to a group of appointed experts, because each case is too individual with respect to facts, issues, and circumstances. The challenge to the panel, with the input of the parties (aided by the partisan experts), is to formulate questions that will make sense and be helpful in resolving the case. In some cases, it might be useful for a panel to appoint a special master with enough scientific expertise to assist in formulating questions and perhaps to act as liason with the group of appointed experts. This and other measures to help craft meaningful questions for appointed experts are a matter for the panel's discretion, depending on the circumstances of each case. Such a discussion goes beyond the scope of this article, except to emphasize that the consensus approach permits an iterative process between experts and the panel (or its staff) to clarify and refine questions if necessary, to ensure that the expert report addresses the panel's needs.

Similarly, there is no single right answer to related questions, for example, whether the parties should have the right to include specific questions in the initial charge to the appointed expert group, or to submit partisan expert comments or affidavits for the group to consider, or to address specific follow-up questions in writing after receiving the expert report, or to cross-examine the appointed experts, etc. We do not advocate any fixed model; too much depends on the individual circumstances of the case and the good judgment of the panel. We simply urge that a consensus approach will be most effective in helping panels to exercise good judgment in making difficult decisions.

The same is true for Delphi approaches, meta-analyses, decision analysis, and the like. These are approaches to elicit and synthesize scientific information in complex areas for use by an agency or other regulatory body that itself possesses the scientific expertise to evaluate that input. The authors are unaware, and would question the wisdom, of any situation where such processes are fed raw to an adjudicative body lacking scientific expertise.

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disagreement among the appointed experts in the *Asbestos Case*. In a case involving more scientific uncertainty, it is reasonable to assume there would be more divergence of opinion among nonpartisan experts. It is easy to conceive of a case in which the majority of the appointed experts opined that the banned or otherwise restricted product posed no significant risk to human health, with only one expert holding the contrary opinion that the banned product indeed posed a risk. Under the *Asbestos* Panel's decision, all that is needed to justify the trade restriction is enough scientific evidence that a reasonable public health official could conclude it was necessary. A respected minority view among informed scientists should be sufficient to meet this test. But how will the panel determine whether the lone dissenting expert reflects a respected minority view or is expressing a personal and extreme position? Indeed, how will the panel know if the conflicting reports reflect a true difference of opinion, or simply a difference in how the various experts interpreted the question? This confusion would be eliminated by a consensus approach. The experts would have the opportunity to discuss and harmonize their interpretation of questions. Moreover, the consensus report would clarify if there were respected minority opinions on an issue, so the panel would not be left guessing whether an outlier was merely an extremist or an anomaly.

The process used for selecting experts in the *Asbestos Case* also raises a concern, which ties in with our concerns about the lack of a consensus approach. Despite the iterative process with the parties, and despite obtaining nominations from respected scientific institutions, a reader of the Panel Report is left with some uncertainty as to whether the aggregate expertise of the experts was adequate. This is not a question about the competence of any individual expert, but rather whether additional experts were needed. The fact that nominations were obtained from respected scientific institutions, and the fact that none of the four appointees had been opposed by either party, give grounds for confidence in their individual expertise, but these facts provide no guarantee that the collective expertise of the appointees is adequate to cover all the scientific issues in question. Indeed, both parties apparently supported having more than four experts, and four would be an unusually small number for a consensus committee involving multidisciplinary issues of the complexity present in the *Asbestos Case.*[20]

It is important to have safeguards to assure the necessary balance and breadth of expertise of appointed experts. One such safeguard is to extend the iterative process, giving the parties the opportunity to request the appointment of additional experts if needed. The consensus approach itself is another safeguard. The appointed experts themselves will be quickly aware if representatives of additional disciplines or points of view are needed to round out their ranks, and they can advise the panel accordingly.[21]

At first glance, the meeting of the Panel with the parties and appointed experts, which occurred on January 17, 2000, might appear an adequate substitute for the consensus approach. However, that meeting did not occur until each appointed expert had submitted his report, committing himself in writing to a particular position. The very heart of the consensus approach is the free give and take, the opportunity to voice, hear, and perhaps modify ideas before having to commit to a position publicly. The natural human reluctance to backtrack from a position once it is publicly stated, particularly in writing, makes any *post hoc* meeting inadequate as a tool for consensus. Further, the procedure followed at the meeting was not designed to promote consensus. The experts had

[20] The parties, aided by their partisan experts, are the logical sources to identify what disciplines or areas of expertise need to be represented among appointed experts. To that extent, we have no quarrel with the procedure followed by the *Asbestos* Panel. Our concern is that the cutoff of iteration once the Panel announced its slate of experts foreclosed any corrective measures, in the event some needed area of expertise was omitted by the Panel. One safeguard is to provide the parties an opportunity to comment on the slate, including any need for representatives of additional disciplines. Another safeguard is the inherent iterative nature of the consensus approach, through which the group of appointed experts could advise the panel if additional experts were needed to cover specific areas of expertise or viewpoints.

This is not meant as an exhaustive list measures a panel could utilize to achieve the important goal of adequate professional breadth and balance of appointed experts. Just as the *Asbestos* Panel consulted international scientific organizations for recommendations of individual scientists, a panel in some cases might find it useful to consult such organizations one step earlier, for advice in identifying the disciplines to be included. Appointment of a special master with scientific expertise might be useful to assist the panel at this stage, particularly if there is a dispute between the parties as to the types of experts needed. Whether these or other measures will be utilized is a matter for panel discretion, depending on the circumstances of each case.

[21] The Panel Report does not disclose how many candidates were nominated by the five institutions, in what disciplines, what objections were made, nor how many experts were not objected to, nor does it describe the training and expertise of the appointed experts. In other words, the Panel Report does not indicate whether the four appointees were the only unopposed experts, or whether they collectively represented all of the disciplines nominated by the five institutions.

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little control over the direction of the discussion or the points discussed. For the most part, they were expected simply to respond to questions posed by the two parties. Moreover, time was limited; the chairman of the Panel repeatedly stressed that time was short and this meeting was the final day of the expert involvement. In short, there was no opportunity for the experts to sit down together with the relevant studies and data in front of them and to debate their respective merits and import. There were occasional references to studies in the course of the questioning, but even where there were differing memories or views, this was not a setting where the experts could stop to collectively look at the data. Most notably, when one of Canada's experts attempted to focus the discussion on clarifying the findings of a particular study, he quickly gave up, concluding the meeting was not the appropriate place for such a discussion. Clearly, the January 17 meeting did not serve, and was not intended to serve, the purpose of consensus formation.

That scientific consensus approaches are imperfect has been pointed out by many.[40–42] Scientists have points of view, and there are interpersonal and group dynamics that play out in any consensus meeting. There is also distortion caused by economic interests, but presumably less so in a consensus committee process than when the same experts are consulted individually. Our goal is not to defend the consensus approach as infallible. Rather, our goal is to explain why a consensus approach would be a far better means of providing WTO panels with useful, nonpartisan advice about prevailing scientific knowledge, and would most effectively serve panels faced with complex scientific issues.[22]

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[22] In the current Symposium there is a article by Joost Pauwelyn of WTO, entitled "Expert Advice in WTO Dispute Settlement," that provides a helpful and detailed history and description of the current process by which WTO panels elicit scientific information. We direct the reader to Mr. Pauwelyn's article for more extensive coverage of this subject. However, we present a diametrically opposed viewpoint as to the utility of using a committee deliberative process for providing information useful for WTO decisions.We do not quarrel with Mr. Pauwelyn's point that there are scientific advisory committee processes that can take up to years to complete and can lead to unnecessarily diffuse and wordy reports. But there are numerous examples in which a consensus committee can give a concise response to a structured question in a very short period of time. Just one example is the process used by the International Agency for Research on Cancer (IARC), a World Health Organization component, that in a very few days leads to a consensus recommendation from assembled outside experts as to the carcinogen classification for a chemical. The IARC process could be streamlined for WTO purposes, in that WTO panels would not need the large authoritative review document typically produced by the IARC expert process. Another example is the Scientific Advisory Board of the U.S. Environmental Protection Agency, which uses a variety of different processes to obtain scientific advice, including short, open meetings in which carefully selected respected experts come prepared to discuss specific scientific issues. Experience with models such as these makes us confident that the potential problems envisioned by Mr. Pauwelyn can be successfully avoided. We do not share his concern that the busy high-level scientists appointed by WTO panels are likely to involve themselves in a "tribunal within a tribunal," or that they are likely to exceed their advisory capacity or in any way usurp the decision-making function of the panel. Extensive experience indicates that specific, well-formulated questions can be addressed effectively and efficiently, within a very few days, by knowledgeable scientists who come to a meeting prepared to deliberate and seek consensus.

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