Those Who Get Hurt Aren't Always Being Heard: Scientist-Resident Interactions over Community Water

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Abstract: This study is about the interaction of scientific expertise and local knowledge in the context of a contested issue: the quality and quantity of safe drinking water available to some residents in one Canadian community. We articulate the boundary work in which scientific and technological expertise and discourse are played out against local knowledge and water needs to prevent the construction of a watermain extension that would provide a group of residents with the same water that others in the community already access. We draw on an extensive database constructed during a three-year ethnographic study of one community; the database includes the transcript of a public meeting, newspaper clippings, interviews, and communications between residents and town council. We show not only that scientists and residents differ in their assessment of water quality and quantity but also that there is a penchant for undercutting residents in their attempts to make themselves heard in the political process.

In our society, the stories of ordinary peoples' relationships to ordinary places remain largely a hidden and untapped resource for understanding the complicated, shifting connections between human behaviour and environmental conditions. (Bowerbank, 1997, p. 28)

This article is concerned with the conflict between scientific expertise and local knowledge in the context of a case study that focuses on the attempt of some residents of one Canadian community to become connected to the watermain

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that already supplies safe and plentiful drinking water to the remainder of the community. We were confronted with questions such as, "Who defines what the real problem at issue is?" and "How are these issues framed differently by scientific experts and by residents who are affected?" This article is concerned with the phenomenon of expert status, which we understand to be an *outcome* of social interactions rather than something that exists before and determines an interaction (Rifkin with Martin 1997). Although the core issue appears to be the access to water, a closer look reveals that the local decision-makers want to limit access to water to prevent further development. We show how in the debate over these issues, scientific expertise and expert status are played out against the experiences and local knowledge of residents. We begin our account by describing how an ethnographer of science in action (e.g., Latour 1987), arriving before the controversy is closed, might come to know about the water issues in our community.

The title of a feature carried on Pages 1 and 5 of the local newspaper reads, "How bad is the water anyway?" The picture, covering one-third of the spread, shows Leo Bull, a resident of Saline Drive in the community of Oceanside filling several 20-liter plastic containers with water at a local gas station some five kilometers from his home.[1] As others who live on Saline Drive, Leo Bull makes frequent trips to the gas station, while others have drinking water shipped to their homes. For years, residents on his street have said that they cannot drink the water, which they draw from wells because they are not connected to the watermain. Although the residents of Saline Drive have brought the issue to the attention of community officials for the past 25 to 30 years (with increasing pressure over the 1998–2001 period) the town council still has not taken any action.

"So when the [Regional Health Authority] began testing the area water last year," the newspaper story goes on, "residents thought they would finally gain scientific ammunition for their fight with [Oceanside] Council. It still hasn't happened." (Woodley, 1998, p. 5)

As we are writing these lines three years later, it still has not happened and the dispute over access to safe water has not been settled, although more scientific, technological, and medical "experts" have been asked to investigate the issue and to complete reports. Some of these experts agree that there are biological and chemical problems with the well water, which vary and even disappear as a function of the seasonally dependent groundwater levels. Other scientific experts suggest that there are only some "aesthetic objectives" that are not

[1] Pseudonyms for people and places are used throughout this article.

achieved, but that the water was safe for consumption, though boiling the water before consumption is always advised. The affected residents have suffered for years from lack of water during certain seasons (usually August to November), from high dissolved mineral concentrations (which destroy their appliances and plants that they irrigate), and from biologically contaminated water. Despite these problems and despite informing the community and local newspapers, the residents do not feel heard—recent newspaper headlines read, "Families desperate for water" (April 20, 2001), "Still can't drink the water" (November 28, 2001), and "Still can't drink the water, say residents" (January 16, 2002). The mayor and town council grounded their recommendations on a report that in turn was based on scientific expertise but disregarded the local and historical knowledge and experiences of the residents who have been hurting the most. That is, those who get hurt are not those who get heard and they are not those whose opinions are taken into account.

Further research into the issues surrounding the Saline Drive water problem reveals that the situation is far more complex than access to safe water. On the surface the problem is one over health and safety issues (water for fire hydrants). For some stakeholders (including the mayor) the real issue is one of increasing the development potential of the Saline Drive area that is currently zoned as "rural estate"; these stakeholders want to make development impossible by not extending the watermain.[2] There also appear to be conflicts of interest such as when one of those writing a report against a watermain holds stock in a company that offers individualized local water treatment solutions and mobilizes support against a watermain (Lavin 2002), which on top of it all, he too would be required to pay for. The scientific experts therefore contribute (unwittingly perhaps) not only to the construction of water quality and quantity but also to an eco-political debate over land development.

Scientists and Citizens

The central issues in the present controversy are access to safe water (from the perspective of the residents) and limiting land development (from the perspective of the town council and mayor). In the process, the relative value of scientific and local expertise and the different levels of exposure scientists and citizens get in making their case were negotiated, used, or undermined by the different actors involved. That is, our case study is about boundary work (e.g., Gieryn 1999). Sometimes scientists do the boundary work; at other times others use scientists, their status, and their expertise in a political process against those

[2] The maximum housing density is higher (a) when an existing watermain provides a means of fighting fire and (b) when an existing sewer line makes the use of land-consuming septic fields unnecessary.

with different types and levels of expertise. Our study therefore contributes to the debate about boundary work as an ongoing process that can be observed in the details of the daily life and interactions of a community, including the news media and public meetings.

Our (post-) modern world becomes increasingly complex, not in the least because of the changes to scientific knowledge and technological artifacts that pervade our lives. There is therefore an increasing need for those with specialized, expert knowledge and for expert knowledge-based action. Scientists have been and still are a ubiquitous source of advice (Hilgartner 2000) and have been conferred power and authority within public domains by virtue of their specialized knowledge and expertise. How such advice is produced, contested, and maintained usually remains hidden from view and is little understood. In a democratic society that is advanced in techno-scientific terms, the need for expertise "poses a fundamental challenge to any attempt to involve the public in the specialized basis of this society, that is, in technical decision making" (Mitcham 1997: 41). The challenge is increased by the fact that the ongoing knowledge explosion has led to an increasing specialization so that the domain covered by any expertise is continuously shrinking, creating a knowledge-ignorance paradox according to which the growth of knowledge is directly associated with the growth of ignorance (Ungar 2000). The question, "What is relevant expertise and who has it (and therefore who is in a position to contribute)?" itself becomes part of the political struggle.

At present, the public is often not involved in solving problems and controversial issues because, so goes the argument, it does not understand the salient issues and concepts or the processes of science. Scientists operating in the spirit of this take "bludgeon publics with 'certain facts,' often ignoring the public's own culturally embedded understandings" (Brown and Michael 2001, 18). It is true that in the past, scientists have benefited from the special status of experts, which conferred to them legitimacy and the rights to speak and to be heard—policymakers, such as those involved in GMO issues, still draw predominantly on scientists rather than those who are affected by the policies. Now, however, the scientists' own status as appropriate experts and associated with the appropriateness of their context-independent knowledge increasingly is questioned whenever they come face to face with individuals of different kinds and different levels of expertise (Epstein 1997; Rabeharisoa and Callon 1999). Scientists often do considerable boundary work to demarcate and defend their expertise based on an epistemologically exceptional status (Gieryn 1999). At issue therefore in the public debate are not just the knowledge itself but also expertise status with respect to the contentious issue (Epstein 1996).

Study Design

In this article, we investigate a controversial issue—in which scientists and engineers play an important role—through the perspective of informed but not necessarily scientifically trained citizen. Because of our diverse backgrounds (research, nursing, fine arts, and teaching), we brought to the analyses quite divergent interpretive horizons. But whatever our prior experiences and personal stance, we realized that we could find ourselves in a similar position as the residents of Saline Drive where access to a fundamental resource is being withheld from us. We therefore expected our analysis not only to yield an understanding of the unfolding controversy, but also hoped that our understanding would allow us to be better positioned should we be involved in a similar controversy.

Research and Data Sources

Since 1997, one of us (Roth) has conducted an ethnographic study of science and scientific literacy in Oceanside. Repeated features in the media showed that some residents in the community recurrently have trouble accessing safe drinking water; three articles alone during the month of this writing (December 2001) showed that the residents' attempts to be connected to the watermain that supplies all other residences in the community have failed. The data sources include extensive field notes, publications produced and appropriated by an environmental group, videotapes of public events, taped formal interviews, newspaper clippings, informal interviews recorded in fieldnotes, and texts and inscriptions from the region that relate to the issues of water, water treatment, watershed management, and water-related ecological restoration. On several occasions, groups of activists and other interested local residents who walked sections of the watershed with different consultants were videotaped. We interviewed a range of participants in a local environmental group, students, and local residents concerning water issues ($N = 25$)—all interviews were audio- or videotaped and transcribed. For the present study, we also drew on the publicly available data—reports, newspaper articles ($N = 15$), minutes of meetings, and the transcript of a public meeting concerning the Saline Drive water issue. These data sources include reports to Council by the Regional Health Board,[3] Logan Consulting, by the Water Advisory Task Force (an interim and two final reports), and a memorandum by the Senior Engineering Technologist summarizing the issues for a regular council meeting. Finally, the correspondence between Council and the president of the local voters association was obtained.

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[3] The Regional Health Board serves a population of approximately 340,000 residents. The organization works to provide a comprehensive, integrated network of health professionals offering services to local residents that includes prevention, hospital, and home health services.

Interpretative Method

We are not only authors but also, in a sense, participants. We provide a reading of the events that make the debate over water for Saline Drive residents a contentious issue. We are therefore representative of an informed audience witnessing the struggle over water, which could affect us, as it already does in one case.[4] Our ultimate goal was to construct understandings that are not only intelligible to people in the community but also transferable and therefore useable by those (including ourselves) who are and will be involved in similar struggles over basic resources.

Our analyses are grounded in a philosophy that is reflexive, hermeneutic, and phenomenological (Guba and Lincoln 1989; Ricœur 1991). A phenomenological hermeneutic stance takes account of the dialectical relationship between understanding and explaining: existing understanding envelops explanation but understanding requires explanation for its development. The reflexive stance forces investigators to ascertain that their world (research processes and products) is subject to the same analytic scrutiny as the world that they study (research object). We began by reading and interpreting the materials individually and constructed initial hypotheses. For example, some initial hypotheses included "citizens are systematically prevented from speaking" or "the real issue is not water quality but fear of development." We subsequently met as a group to discuss our individual analyses. One or two authors developed the analysis of a particular dimension (hypothesis) identified and prepared a written analysis, which was made available to others through a website. In subsequent meetings, we tested emerging hypotheses by explicitly seeking negative cases (Guba and Lincoln 1989), that is, for evidence that did not support a hypothesis or claim. This was achieved by means of a division of labor. In sessions involving all authors, those members not presenting the case for a hypothesis served as devil's advocates seeking information that disconfirmed the hypothesis in question. In this way, we refined our interpretations in subsequent discussions and by taking into account new developments of the issue as these played themselves out in the local newspapers while we conducted this analysis.

We recorded about one half our discussions, making them thereby available for subsequent viewing and constituting them as a document of the emerging concepts and understanding. That is, the recordings document "progressive subjectivity" and, together with the written artifacts, provide an "audit trail"; both processes are essential research components that contribute to the quality of interpretive research (Guba and Lincoln 1989).

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[4] One of us lives in a neighborhood similar to Saline Drive but in the adjoining community. Here, residents fought against being connected to a town sewer line, which would allow the housing development that the residents did not want to occur. See also note 2.

Situating the Water Problem

The controversy over water at the core of the current article takes place in Oceanside, a suburban municipality with rural character that is part of an urban district divided into municipalities. Despite its location in an area of temperate rain forests, the microclimate of Oceanside is such that it only receives 850 millimeters of rain per year, most of it falling in the November to March period and very little during the remainder of the year. The local aquifers are insufficient to supply the community with water, which therefore has to be piped about 40 kilometers from reservoirs situated in a nearby hilly region. Recent developments have exacerbated the issue by altering the water flow over and through the ground. Much of Oceanside lies in the Henderson Creek watershed. To drain the bogs that used to exist before the arrival of the European settlers, farmers had straightened the creek thereby turning it into a channel. These changes allow the water to flow away faster—with the effect that in the summer months, the creek is but a trickle (10–20 liters/second) supplying insufficient water for resident farmers to water their fields. A considerable number of wells are used for irrigation. The combination of quick run-off and ground water use for farming heavily tax the groundwater system. Other changes are related to urbanization and the increase in impervious surfaces (e.g., pavement, roofs, and concrete driveways) with concomitant use of storm sewers. Losses of forest cover throughout the watershed and along the stream banks, loss of wetlands and recharge areas, and the loss of natural stream conditions further increase the pressure on the aquifers. The leader of a local environmental group quickly pointed out that the Henderson Creek watershed is at the upper limit of total impervious surfaces that still allow for healthy watershed and streams.[5]

To have an appropriate mechanism for dealing with the pressing water problems, the community of Oceanside formed the Water Advisory Task Force. Its role was to make recommendations to Council with respect to drainage, watershed, water management and other factors that impact the environment related to water issues (Official Community Plan §8.2.3, Policy 6). Its seven members represent a diverse group of residents at or near Saline Drive, four of whom would be connected to the watermain in the process, but also would have to pay for the extension whether they agreed with it or not. The members included two university professors with pertinent expertise (chemistry, environmental law), an ocean scientist, two farmers, a market analyst, and a real estate developer.

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[5] We have been told that the important point is that the water does not enter the ground; some people claim that a watershed can function at 30–40% impervious if engineering structures direct water immediately into the ground rather than into storm drains i.e. no roadside curbs (Stuart Lee, personal information, January 16, 2002).

Oceanside is a community with rural character that spreads over a considerable area, with two areas of higher population density. Saline Drive, the area involved in the controversy, lies on a small wooded peninsula, about five kilometers away from both higher density areas. The residents have individual wells that draw on the water in bedrock fissures. For years, the local and regional newspapers reported that in the summer months, some well water in the Saline Drive area was biologically and chemically contaminated, including the period reported in our opening vignette. Sometimes, the residents were advised by the Regional Health Board not to use their water at all or to boil it considerably; many residents have opted to get their water from gas stations in one of the two areas of higher concentrations. For 30 years, these residents of Saline Drive demanded to be connected to the watermain that supplies other residents of Oceanside (McCullogh 1999). In recent years, they increased the frequency of their demands and sought exposure in the local media in support of their cause. The residents brought the issues forward to the Regional Water Commission, which decided that the issue was a municipal concern (Minutes of January 20 1998 Meeting,). However, Oceanside town council and the mayor blocked all demands, attempting to keep the watermain away from Saline Drive to prevent the area from being developed (Watts 2001).

At issue is not just the water for Saline Drive. The residents of Newbury Road, which connects one of the high-density areas and Saline Drive, currently also draw their water from wells and would "benefit" from a watermain. Such a connection would be particularly useful to a large farm, the operator of which is a member of the Water Advisory Task Force.[6] The watermain would also come with fire hydrants and decreased fire insurance costs for the currently unprotected homes. However, the appropriate capacity for fire protection (as required by insurance companies that set the rates) by far outstrips the water use by the existing homes, so that laying a watermain opens up the possibility for further development of the area—though it is currently protected from development due to its Agricultural Land Reserve status. The increased fire protection in itself would allow smaller lot sizes, with homes being built closer together than currently possible under the existing building code that regulates Saline Drive.

In the past, individual families on Saline Drive (through scientific consultants they hired) and the Regional Health Board had tested the water. Invariably, a variety of problems were noted including chemical and biological contaminants. However, the Water Advisory Task Force decided that previous studies and testimonial evidence was insufficient or flawed so that it hired an "independent" firm, Logan Consulting, which is on the official list of the provincial

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[6] Although the water would be useful, it is not clear whether the farm as others in the area would actually be able to afford its price if it was sold to farms at the same rate as to regular households.

government for registered groundwater consultants. This firm regularly works for various communities in the areas, with special expertise in groundwater, impact of effluents, and sewage on water quality—the communities often require comprehensive drainage study and storm-water management plan prepared by a "professional engineer registered in the province." Our background research revealed that the same consultant firm took part in other controversies, where its studies had been contradicted by the results of other scientific studies. This has led litigants in those controversies to play on the contested nature of reports prepared by Logan in past court cases.

The Water Advisory Task Force collected information on each well on Saline Drive and developed seven alternatives to a watermain connection. These included well- or truck-filled cisterns, a community cistern, desalination, freshwater recharge, recycled wastewater, deeper wells, and rainwater storage. For each of these options, positive and negative aspects were listed. When it came to filing a report with the community, the task force was split on recommending a watermain versus "case-by-case household" solutions. The four-member majority (law professor, ocean scientist, small farmer, and market analyst) voted against the extension and suggested that each property should adopt its own local solution to the water problems; only one of the four supporting the majority report would be connected to the watermain. The majority report relied heavily on the analysis of subset of the wells conducted by Logan Consulting. The minority report (chemistry professor, developer, and big farmer) pointed out the weaknesses of the individualized solutions and favored an extension of the watermain; all three would be connected to the new watermain. The recommendations in the minority report were based on the testing results by the Regional Health Board and on the testimonial evidence given by the residents, including the results of their own scientific consultants.

The senior engineering technologist for Oceanside prepared a report to Council that summarized the results of all other reports and proposed a series of policies and options. A large part of the report focuses on the Official Community Plan (OCP) and the Land-Use Bylaws. (This report had been reviewed and endorsed by the director of financial services and the director of planning and building services. Furthermore, municipal engineer and clerk administrator had signed to concur with the recommendations.) In particular, the report details that these existing documents (OCP, Land-Use Bylaws) do not allow the subdivision of existing rural and agricultural properties for the development of new housing units.

The direct implications of having a watermain extension are difficult to quantify. The availability of water could encourage some property owners to either develop under the existing zoning, or to apply for rezoning.

> With the current Provincial support for the ALR [Agricultural Land Reserve] and given the policies of the OCP [Official Community Plan], however, it would be difficult to support any rezoning of or development of the lands zoned Agriculture.
> For the lands designated Rural, the OCP and the Land Use Bylaw should continue as constraints on development. Another constraint on development would be the suitability of the soil for sewage disposal. (Memorandum, p. 7)

At issue therefore was not merely whether and how to get sufficient and suitable water to Saline Drive but also whether any changes would allow further development of the area. Following the meeting in which the report was accepted the town council decided to provide the public with a forum in which reports and issues could be discussed. Consistent with a fundamental principle enshrined in the Official Community Plan, which states that residents and businesses would be consulted about decisions that affect the present and the future of the community, a 1.5-hour open-house event was organized; at this event, the different reports and graphics prepared by the technical presenters were made available. This event was immediately followed by a public meeting in which technical and advisory bodies made presentations (45 minutes), the public asked questions directed towards the technical presentations (15 minutes), and members of the public made comments (30 minutes).

Contested Fields: Personal Health and Land Development

In the dispute over the quantity and quality of water, the residents of Saline Drive favored a watermain extension to solve their problems. The town council was against a watermain extension favoring instead local, water-treatment solutions. The two ways of framing this dispute centered around the conflicting issues of health concerns and fire safety on the one hand and land development fears on the other. The main point of contention, which involved scientists, were the health concerns; here, considerable differences between the expert scientists' views and those of the residents became evident. The real issue for others was the fear that the Saline Drive residents wanted a watermain extension because it would increase the value of their land and allow further development. The differences between the residents and other participants on these two issues are elaborated in the following.

Scientists and Residents: Divergent Views of Health

Our community research shows that the ordinary citizens often feel disenfranchised in public meetings by scientists who talk in decontextualized ways about issues that directly affect citizens' lives in deep and concrete ways (access to the watermain, presence of a high-power microwave emitter, becoming connected to a community sewer system). In our community, as elsewhere (Brown and Michael 2001), scientists often subdued their audiences with what they call

facts and methods and by using language not always accessible to the residents. This was also the case in the debate over the watermain extension. Thus, scientists' talks are replete with acronyms and words and procedures meaningful in laboratory contexts.

> The total dissolved solids or TDS show the significance of dilution and if you look at the aquifer, you'll find that as the aquifer is drawn down, the chemical constituents increase. So there is a fairly significant influence by the dilution of the rainwater. We had a problem and a high level with our chromium levels. Chromium can be a problem when it combines with chlorine and goes to the trivalent state: this is when a carcinogen is formed. (Chief environmental health officer from the Regional Health Board, public meeting)
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> The method we used was to sample nine representative wells at the wellhead. We chose the wells by their distribution in the area, well depth, well yield, and sampling history to get a representative cross-section of wells. . . . The sampling methodology was, "Sample as close to the well as possible and at an outside tap or right at the wellhead." We avoided house plumbing and cisterns as much as possible. So we pumped the wells for as much as fifteen minutes and as much as one hour to get a fresh water supply coming straight from the aquifer and not coming from storage. (Logan, consultant, public meeting)

Here, as elsewhere, the scientists ignored the residents' own culturally and historically embedded understandings. Highly technicist (monoglossic) discursive repertoires were played out against more heterogeneous and encompassing (heteroglossic) discourses of the residents. This is also the case when it comes to the perspective toward individual and environmental health understood in different ways by scientists and the members of our community. Different views of health have surfaced over the years including the "medical" and "socio-environmental" approaches. The medical position, which comes from a scientific point of view, considers health as the absence of disease and focuses attention on a disease/treatment (breakdown/fix it) sequence (Labonte 1993). In this ongoing water controversy, the scientists hold this view.

Pertaining to the Saline Drive water issue, the community meeting was primarily organized by public officials to have the "experts" present their scientific technical reports and to allow residents to "air their personal opinions" and to "talk about the various options that were available." Generally, the scientific reports stressed the fact that the water did not present a danger to residents' physical health because of the lack of biological contaminants at the time of the measurements conducted by Logan Consulting. At the same time, the Logan report downplayed existing chemical contaminants by using the euphemistic descriptor of "aesthetic concern." Thus, although these "aesthetic concerns" contribute to a substantially decreased quality of life (quickly corroding water pipes and appliances, dying plant life, or scales on skin while taking showers), they become negligible within the technocratic repertoire of the consultant re-

port and of those who adopt it (WATF, Council). These reports adhered to statutory guidelines, scientific language, and public policy that fit a technicist view of health.

> According to the Guidelines for Canadian Drinking Water Safety,[7] there's no concerns related to health within the parameters we tested. There are some aesthetic objectives related to health. Aesthetic objectives are for certain parameters in the water that may cause the water to be corrosive, deposit forming or unpalatable. These are given a separate category because they are not a health concern but they are a concern. (Logan, consultant, Saline Drive Public Meeting)
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> Chromium as it generally occurs in the water system is fine. It is a nutrient. But when we have to chlorinate a water system that's where we have the potential for some problem. . . . No problems with fecal coliform organisms. . . . We do not have any problems relating to nitrites or nitrates that would be the influence of man via agriculture, farming, or pesticides, or run off from roads etc. . . . Our main concern in this issue is the promulgation of public health and safety. (Chief Environmental Health Officer, Regional Health Board, public meeting)

In contrast to the technicist medical discourse, the World Health Organization (WHO) sees health as a personal resource that includes societal and private assets and physical capacities and the extent to which an individual or group is able to fulfill aspirations, to satisfy needs, and to change or cope with the environment (Labonte 1993). This view conceptualizes health in its broadest sense considering many determinants of health and emphasizing that health-supporting actions go beyond simply dealing with disease-treatment. In the socio-environmental approach, personal experiences of health are phenomenological experiences, constructed through social interactions with others and a shared repertoire of intersubjective meanings. To achieve this vision of health, one must explore and understand how peoples' experiences of health relate to their experiences of capacity and connectedness.

As in newspaper articles and interviews, many residents who spoke during the second half of the September 22 (1999) public meeting made strong and at times emotional comments about a wide range of issues and about their experiences living without reasonable quantity and quality of the water. The residents talked extensively about health along the line of the WHO socio-environmental perspective. Residents articulated daily experiences including financial costs, physical health, personal hygiene, safety issues, lack of social and personal enjoyment of their homes, and the emotional toll of insufficient quality and quantity of water. Based upon the WHO's definition of health, the quantity and qual-

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[7] These standards are available from the website of Health Canada (http://www.hc-sc.gc.ca/ehp/ehd/catalogue/bch_pubs/summary.pdf).

ity of well water available to residents of Saline Drive had many unpleasant effects on the residents' health.

> Not until you actually live under these conditions does one realize what an amazing impact this problem has on your life… You can't drink or bathe in the water, feel clean and safe, stains household laundry, can't water our plants, can't grow a proper garden, our insurance costs are 20 to 50% higher. We have constant replacement of pipes and pumps. We can't clean anything in the house properly. . . . We cannot put a dollar figure on our improved health, the enjoyment of our homes and gardens, reduced fear of forest fire, and the freedom not to worry about the next drop of water. (Resident of Saline Drive, Public Meeting)

Inherently, it does not appear inappropriate to bring different discursive repertoires into communicative processes. Even what appears to be a singular repertoire, such as a monoglossic scientific discourse, always and already contains antonymic elements; any existing or remaining monolingualism is always the monolingualism of the Other (Derrida 1998). It is of concern, however, when there are not only different discourses and concerns but also refusals on the part of those who employ the technicist repertoires to listen to and even less to accept the views and repertoires of the other. Thus, we noted a discrediting of local knowledge and Regional Health Board testing results as the controversy unfolds and particularly throughout the public meeting. We return to this issue after articulating what the real issue was for the opponents of a watermain.

Community Politics: Preventing Development

A variety of data sources (meeting transcripts, newspaper articles, and letters to Council) suggest that there is a close association between the water issue and concerns about the development of the area. Every time someone talked about the watermain extension as an option of solution for the water problem in the area, the development issue also emerged. Two opposite positions about the development issue in this community can be distinguished. These mediate the different opinions about the water problem and the possible resolutions.

On one side of the issue there are the Council members, some members of the Water Advisory Task Force ("majority" group), and some residents who oppose the watermain extension. They ground themselves in the Official Community Plan (OCP), which states that the Saline Drive area cannot be developed. These individuals insist that residents should know that when they choose to live on Saline Drive they are not going to have potable water. Thus, the speaker for the WATF Majority report suggested:

> We noticed as well that the OCP in the area, going back to the seventies and onwards talks about providing limited service in these areas because of population diffusion and

the maintenance of the rural character. The definition of the rural zoning is "limited infrastructure." So people who moved to this area, including all of us in the Task Force, came knowing that the community decision, the community status quo is one of providing lesser than the normal residential level of service in order to be cost effective and in order to maintain the rural character of the environment. And I think that it's important, and this is a discussion that we can have at that, that we recognize that our decisions do have an impact. (WATF member, public meeting)

The mayor also referred to this issue, addressing more clearly the water services in the area, "It's a longtime municipal policy to keep potable water away from people living on Saline Drive. That way the municipality discourages future development. It's a longstanding policy of making sure the people are on wells and not having potable water down there" (Times Colonist APR 20, 2001). Thus, although there was no written policy to keep the water away (report to Council by engineer), the enacted policy was to prevent any development by keeping the watermain away from Saline Drive.

The community itself is divided on the development issue. "Anti-development" advocates distrust those of Saline Drive who want to be connected to the watermain.

I don't believe there are any problems with Saline water… They want water down there in order to develop it. They want that [municipal water] because they are a development lobby. (WATF member, market analyst, and opponent to watermain, quoted in Watts, 2001)

[One] dissenter is a "dinosaur" developer, a guy whose house has nine bathrooms. He thinks he is entitled to be able to use them all, all of the time. He clearly sees no problem with development, and in his dissenting minority report even mentioned that issues related to the rural character of [Oceanside] are out of the scope of the task force. (Environmental campaigner, September 9, 1999)

Anti-developers do not want the proposed watermain as a solution for the water problem to provide an obstacle to development. They argue that there are "no problems at all," a statement that finds support in the Logan report. It is therefore not surprising that all other forms of knowledge and information on the issue need to be downplayed. They not only downplayed those of others but also actively denigrated other information as unscientific or "bad science" (informal interviews with two anti-watermain WATF members).

On the other side of the issue there are the remaining members of the Water Advisory Task Force ("minority" group) and many residents of the area, who have lived there since this issue started 30 years ago. These individuals tell their life stories to confirm the existence of quality and quantity water problems in this area, and they seem to be very tired of waiting for a solution for these prob-

lems. These residents want and need potable water, but they are not necessarily against the maintenance of the rural character of the area:

> I believe they're all very environmentally conscious and wish to maintain the environment as it is today. We're not interested in development. (Resident and president of the Oceanside West Voters' Association)

Besides, there are many other ways to avoid development without depriving the Saline Drive residents of the right to access water in the same way that their fellow citizens do. Several Saline Drive residents made public statements to this affect.

> Future subdivision is in the hands of both Council and the local homeowners. Public hearings would have to be held, environmental impact studies must be done, in the same sort of factors that affect an applicant for subdivision now will still be in force, if and when water is finally brought to us. (Resident, public meeting)
> There is very little development that could occur from the water going into Saline and there are many ways that Council can use to curtail any future development if you're worried about it which I now you are. And that's fair. I'm worried about it too. (Resident, public meeting)
> Municipalities have zoning bylaws, development permits, building permits and a whole host of legitimate means to control land use. They have no ethical right to withhold potable water from people. As well, drinking water is not the municipal service that makes high-density development possible. (Resident, WATF member, proponent of watermain, Times Colonist April 20, 2001)

The real issue, then, appears to be development; scientific expertise becomes a mere pawn in the efforts of those who want to prevent the construction of a watermain extension. The municipal government (mayor, Council) and a small number of residents do not want a watermain extension for fear of further development, which might change the rural character of the community as it currently exists. Despite assertions by the residents that they were not interested in development, the municipality continues to block water access. The extension of the watermain certainly is not the only option here. But the other solutions proposed are also associated with ranges of negative aspects.

Scientific Experts and Citizens: Politics of Public Discussion

The residents of Saline Drive have been successful in getting their side of the issue into the local newspaper; but this publicity has not (yet) paid off and Council and mayor still are against a watermain extension.[8] (Informal interviews

[8] The case is not closed and, while in the process of reworking an earlier version of the manuscript, the mayor stated during another public meeting that a watermain to the sec-

with the anti-watermain extension WATF majority group show that they too were seeking greater media exposure to help their own cause.) An important issue in the public discussion of contentious issues is who gets to speak and who gets to be heard. When large (multi-national) companies get involved in contentious issues, they often have consultants that assist them in preventing and resolving public controversy (Beder 1997).[9] In some instances, this leads to the exclusion of environmentalists and other concerned citizens even before they meet scientific experts face to face (Sherman, Gismondi and Richardson 1996). When the discussions are in a public forum, such as during a public meeting, levels of participation and expert status are not granted and exist a priori but are important outcomes of the interaction between the various participants in the meeting (Rifkin with Martin 1997). In the present study, who gets to speak and who gets to be heard (listened to) were important dimensions of the ongoing controversy. We address each of these dimensions in turn.

Who Gets to Speak?

The first part of the public hearing constructed the scientists and engineers as "the experts." Each expert present was provided with the opportunity to elaborate key issues in the reports that he had produced, and took the amount of time he deemed necessary. There was no attempt to shorten or curtail any of the presenters—as this would happen in the subsequent parts of the meeting. The experts were constructed as such also by their own and the moderator's description of positions, titles, or degrees they held. Thus, individuals were variously introduced as "professional engineer and a professional geologist," "Public Health Engineer serving the regional district," "[the] Environmental Health Officer for the Oceanside area . . . has a Masters of Science degree, and has significant experience with water quality issues and he has been involved extensively in both reports in the sampling episodes" or "Chief Environmental Health Officer for our Health Region."

The transcript of the Saline Drive Public Meeting held September 22, 1999, shows that the residents talked about their water problems experienced in the past and present *after* the scientists, councilors, Regional Health Board engineers, and the WATF members. The evening's agenda focused on presentation of various reports followed by question and answer period from the audience. At "9:30 PM," the meeting was moved to "public opinion and comments." The town engineer who functioned as moderator asked audience members to "Just

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ond high-density area is still possible as well as a district-wide referendum (Lavin 2002: 11)

[9] Some of the techniques that such consulting firms use to target specific audiences to adopt their clients' viewpoints are outlined by Connor (1985/1994) from Connor Development Services, Victoria, BC.

give [their] name and address for the record and try and keep your comments as brief as you can in the interest of time." Once the last comment had been made, the meeting was called to an end; the agenda had not included time for interactions to relate scientific and local expertise and how they could enhance the discussion and contribute to the resolution of the controversy. The issues brought forward by the residents, who were and still are experiencing "first-hand" the effects of non-potable water and inadequate water supply, provided important contextual information regarding history of the area's water supply and development.

In contrast to the experts' turns at talk, there were repeated instances where the residents were cut off from talking, while asking questions or making comments in the second part and third parts of the meeting.[10]

Resident: Well it seems to me that the report is relying- (Name, speaker for WATF majority)'s report is relying on very heavily on your information, which would suggest that it doesn't matter what the problem is with water, it can be treated. And I would beg to differ on that because I think that when you do something to the water, you affect it regardless of what the treatment is and where the treatment occurs. And that it affects the water in another fashion. So therefore this business of treating water is only a marginal thing with respect to water qualities.

Moderator: We are straying sort of into the area of public opinion and your comments-

Resident: He's an expert he just told us-

WATF member: Well, I'd like to make one comment on this-

Resident: I'm addressing, I'm addressing-

WATF member: You're looking for technical- This is supposed to be a *technical* discussion and I think…

Resident: No I'm talking to Mr. Logan. I'm not talking to you, I don't think-

Audience: ((Applauding)) Yeah, we wanna hear.

Moderator: (Name of resident), I'm sorry but you're really not. If we can keep to a specific question you are certainly able to ask questions if we're going somewhere with it but I don't want to get in to a detailed bit by bit tearing something apart.

Resident: Why? I mean, I'm asking-

Moderator: Because, because-

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[10] The following transcription conventions are used:
((Hands clapping)) —actions other than spoken words are enclosed in double parentheses;
(Name) — insertions to replace identifying names are shown in single parentheses;
[— square brackets in consecutive lines indicate the overlap of turns by two speakers;
technical — words stressed by the speaker are italicized; and
this- — sudden stop in a speaking turn, often associated with overlap by another speaker who continues.

Resident: This is our only chance to talk to this man who has made a report that influences our lives.
Moderator: Yeah, but it doesn't directly influence your life to the extent that everything is going to hinge on his report. It's merely one bit of information and we've got lots of information back and forth. Other people are presenting as well-
Resident: Well, I disagree with you.
Moderator: Can I ask- Sorry, can I ask you if there is a specific question that you wish to ask of Don Logan specifically?

The moderator qualified the resident's comments as "public opinion." The WATF member implicitly disqualified the resident's questions and contributions by contrasting them with the descriptor "this is supposed to be a *technical* discussion," stressing in particular the word "technical." This comment is not neutral because it marks what the resident had said as lying outside a technical discussion. Both contributions therefore constituted part of the boundary work by Logan and those who drew support from his report to distinguish expertise from its antidote, everything that is not technical and therefore mere opinion. The sense that science was elevated to special status and other knowledge was excluded existed among participants in the meeting and within this author group, which was something of a second-order audience to the interactions in that room.

The WATF member speaking for the majority and others repeatedly attempted to interfere with residents, who simply wanted to have their concerns "heard." But they were interrupted and sometimes had to give up their turn, and were thereby excluded from examining Council's argument. Council had elevated the "scientific" ("technical") points of view as more important than the actual concrete examples of the effects of the water on residents' quality of life. During the meeting, the moderator of the meeting actively suppressed resident input. In the following exchange, the moderator worked to prevent the president of the local voters' association and pro watermain from commenting on the contribution made by one of the Water Advisory Task Force members (against a watermain).

Resident: I too would like to make a comment about the previous speaker's comments. I believe we all [have a
Moderator: [Frank?!
Resident: Frank Fowler.
Moderator: Yeah, I know but everybody has a bias or a concern about it.
Resident: No [I could
Moderator: [I don't know if (name of another speaker) said anything in particular. All he was doing was presenting his [side-
Resident: [This is, this is just a [comment-

Moderator: [his side of the Water Advisory Task Force. Well, okay. Let's try [and-
Resident: [It's very brief.
Moderator: Well, let's try not to bash each other, please.

The repeated instances of overlapping talk show how the two individuals compete for the speaking floor: the moderator (town engineer) attempted to take the speaking floor from the resident, who endeavored to take the floor to make the desired comment. Perhaps the moderator tried to prevent him, as anyone else, to engage in critique that might lead to a confrontation with the scientific point of view ("let's try not to bash each other"). In another situation, when another resident pointed out that there were problems with Logan's assessment of the hydrograph readings, the moderator cut the speaker off:

> I hate to cut you off. . . . Don's (Logan) report deals with a specific time that he took the samples. We recognize already through (name of Chief Environmental Officer, Regional Health Board)'s comments on their original testing that there are differences in the quality of the water throughout the time. I don't think that you're going to find a smoking gun one way or the other. You may be able to pick apart on specific instances but in general, I don't want to as I say, get into a slugfest over particular pieces of the report. Don is not here to defend every little bit of it.

The moderator admitted that the Logan report could be picked apart on specific instances and particular pieces of the report—in the course of the public meeting, the residents on Saline Drive brought up numerous problems and inconsistencies—but still cut the person off making the suggestion that in general there was no problem. Rather than allowing all the discrepancies in the Logan report to come out, be listed to and taken into account, the efforts of residents to articulate its inadequacies were curtailed. Time and again, the moderator stopped residents short by using comments such as, "I was hoping not to get into picking things apart" or "I don't want to get into a detailed bit by bit tearing something apart." If "hearing" individual concerns was really an important goal of the decision-making process, mechanisms are necessary that de facto allow residents and other citizens to provide input. At this point, we can only wonder how increased levels of input would change the direction of the present dilemma. If those residents had the "feeling" that council understood the enormous impact this issue has had on their quality of life for over 30 years, how would this understanding contribute to the residents' perception of a change to their quality of life?

In part, therefore, the political debate in our community consisted of boundary work to making illegitimate the local knowledge and experiences of residents; to another part, some boundary work was done to prevent access to the debate in the first place. Our analysis shows aspects of the microphysics of con-

trolling the access of stakeholders to speak in a place from which they could be heard.

Who Gets to be Heard?

Discourses cut up and create the world (Foucault 1972); they embody and impose particular ways of seeing the world, which in turn are reified when we perceive in the way the descriptive concepts impose on us. Thus, "technical reports" lend credence but "opinions" and "comments" are just that; they are constructed here as having insufficient validity to be used as a basis for making decisions. There existed considerable differences in the way health was viewed, leading to different forms of action considered by the parties involved.

In the present controversy, the local knowledge, accumulated over nearly 30 years (including privately financed consultant reports), and the test results accumulated by the Regional Health Board have been downplayed and disregarded by those who are against the construction of a watermain to solve the water problem. Local knowledge was downgraded to constitute mere "opinions," inappropriate to become part of the decision-making process. Thus, the Water Advisory Task Force discredited in its report to Council information other than the one provided by the consultant (whose methodology has shown to have flaws during the meeting). The speaker for the majority report reiterated the preference for the "first systematic assessment" of the water. He described all other information as "wholly inadequate," including that gathered by the Regional Health Board scientists. The repeated demands for access to water were qualified as "barrage" and therefore marked at least as an (unwanted) nuisance.

> Mr. Logan's report is the first systematic assessment of the aquifer and that up until the time at which that was requested, the Council was being barraged with demands to make high levels of public expenditure based upon information from the taps. And the Region Health Board's testing methodology, which we supplied, we made an assessment of it, if we want to talk about a testing methodology, the testing methodology up until the time that Mr. Logan came in, was wholly inadequate. (WATF member, opponent to watermain and development, public meeting)

For some 30 years residents have been expressing their concern to council over the water. Their issues, coping strategies and ongoing concerns of health issues due to the quality of water have not been truly "heard" by the town council. By means of letters signed by their spokes person, the president of the Oceanside West Voters Association, the Saline Drive residents have repeatedly expressed concerns to the town council regarding the quantity and quality of their water issues. Yet in their responses, the town council and WATF have been without regard for the emotional and physical toil created. Residents continued to communicate the stresses resulting from the ongoing struggle over health

risks and temporary solutions, personal costs in terms of time and energy needed to find alternatives while the issue was and is being debated, monetary outlay to replace equipment and appliances due to corrosion, lack of ability to utilize their land productively through growing plants and gardens, ongoing concern of the potential for health issues, and the ongoing stress created by a lack of resolution of the issue.

The town council has responded to resident concerns in the form of "scientific" data that there are no health concerns created by the poor quality of water, and that they "knew this stuff and [they] still moved there." Any scientific report that did not support the anti-watermain position was downplayed as being flawed. For example, the report prepared for the Oceanside West Voters' Association by an environmental engineering firm did not enter the decision although it had made clear that "there is a possibility of a health hazard; the water is unpalatable and staining, causing the malfunctioning of laundry machines and dishwashers" (Report, November 2000). Replies such as these only led to further feelings of frustration of concerns not being "heard" by Council. As one resident explained, "it's driving me crazy. It just absolutely disrupts your life." Such examples also illustrate the effects on residents' quality of life. Maintaining a balanced life requires that one is able to resolve problems that create stress. It is a well-known fact that unresolved stress alone can lead to illness. What price must these residents pay for their decision to live on Saline Drive? The stress of this ongoing issue and its consequences are taking its toll on the residents' ability to experience a good quality of life necessary to maintain health and well-being.

It is not surprising that many in the community believe that Council and mayor based their decision for not supplying Saline Drive with water on the report of the consultant, supported by the majority recommendation (four members for, three members against the watermain) of the Water Advisory Task Force. Thus, the scientific expertise associated with one report predominated over the weight of the reports from the Regional Health Board, residents, and the data collected by other consultants hired by the residents themselves. This one report was "heard" over all the other evidence provided that was consistent with a different solution of the controversy.

A recently released report by the Medical Health Officer of the Regional Health Board notes that there are no immediate health concerns but continuing "aesthetic" problems with the water. In the present context, "aesthetic problems" must be qualified as a euphemism, for the same report specifies that many wells do not meet the Canadian drinking water guidelines on parameters such as taste and color, hardness, chloride, iron, and manganese. In fact, the officer stated, "many samples had concentrations that are well above the established guide-

lines" (Lavin 2001: 3).[11] This report supports the claims made by the residents. To date, the community has not made a decision whether to build a watermain, although there would be no cost to community or taxpayers according to the Oceanside West Voters Association (Lavin 2002). The residents and government grants would cover the extension.

Discussion and Implications

The context of our study is a contest over access to safe drinking water. Water is a precious resource. One might think that in an industrialized nation such as Canada, access to save drinking water would be a given, especially after the much publicized disaster in another Canadian town, Walkerton, Ontario, which in May 2000 claimed the lives of seven people due to an *Escherichia coli*-contamination of the public water supply.[12] According to the Auditor General of the province in which Oceanside is located, users of small water systems "should be able to expect some minimum level of source protection along with an appropriate level of information on the quality of their water source" (OAGBC 1999: 121). Our study showed that even in one of the most industrialized nations, access to safe drinking water cannot always be taken for granted. In the contest over access, science and scientific expertise were rallied to deny the same resource that others in the same community freely have at their disposal. One might also think that in such a nation, distributive social justice concerning basic life necessities would be enacted and that all levels of government live up to their responsibility to ensure that citizens have access to services that meet basic needs (CRS 1999). Our study showed that even in a democratic country that is proud of its social programs (universal health care, general welfare), distributive social justice cannot be taken for granted automatically. Again, science and scientific expertise were rallied to deny some residents of one community the same services that others already receive.

Our study is about the interaction between scientific experts, local residents, and community politicians in a contentious issue over access to safe water. We provided fine-grained descriptions of the boundary work conducted within the community to distinguish between scientific and local knowledge, and the work

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[11] The Canadian drinking water guidelines, which apply to drinking water from all private and municipal water sources, have been developed for a variety of microbiological, chemical, physical and radiological parameters; although recognized throughout Canada as the standard of water quality, they are not legally binding. The provision of drinking water is a provincial responsibility so that the provincial and territorial governments generally establish their own measures of water quality based on the Guidelines.

[12] The public inquiry into the tragedy, conducted by The Honorable Dennis R. O'Connor, has been completed and the full report is available at the official website for the Walkerton Inquiry (http://www.walkertoninquiry.com/).

done to delimit who speaks and who gets heard. It is also boundary work to distinguish those who have the right to access safe water and those who do not; and it is boundary work to distinguish those who gain from and those who have to carry the costs of changes to the environment. As analysts we note that in this issue there exist efforts to delimit the role of local knowledge and to privilege scientific expertise as independent and therefore as superior to other pursuits. As citizens more broadly and as residents of the same district, and independent of our personal perspectives, we note our disaffection with the political process that shows unwillingness or inability to establish an *open* debate in which all sides attempt to articulate common interests and distributive social justice. Clearly, although the town council organized a public hearing, the residents felt that they "had not been heard" and that their concerns have not entered the decision-making arena. Scientists' pronouncements were elevated to truth and taken into consideration for making decisions, whereas residents' knowledge and contributions were disregarded as mere opinion, unqualified to be taken into account to make a decision with regard to the watermain extension.

Democratic ideals, particularly those consistent with inclusive democracy (Fotopoulos 1999), imply a greater involvement of the public in policy-making issues that pertain to or involve science and technology (Irwin 2001; Rowe and Frewer 2000). There are opportunities for new forms of solutions to emerge from the interaction of a greater variety of experts, including those with special traditional, local, and historical knowledge of the contentious issues (Roth and Lee 2002). However, aspirations to be more inclusive do not automatically eliminate boundary work. As the analysis of jury trials showed, the boundary work involves social and political judgments to decide who is competent with respect to a particular issue and what the level of this competence is (Edmond and Mercer 1999). However, greater involvement of the public does pose new questions: "How do ordinary citizens participate in reflecting on science and technology?" and "What level of scientific and technological literacy do citizens have to bring to be legitimate participants in the public debate?" There are some examples in the literature that show how some groups of citizens shift existing unequal relations between themselves, with particular types and levels of expertise and more traditional experts. Public participation can contribute to create effective rhetorical spaces that legitimate rather than discredit the stories of ordinary people as co-producers of environmentally sound knowledge and behavior (Richardson, Sherman and Gismondi 1993). In such processes, expertise pertaining to local particulars (such as knowing the history of the wells, their fluctuations, and seasonal contaminations) shifts traditional boundaries of what is considered to be legitimate expertise. Local expertise gains ground and even becomes central and can be used to call into question evidence presented under the guise of decontextualized, scientific expertise. That is, public participation potentially contributes to produce a more inclusive and better science.

The larger study (conducted by Roth) within which the present work is situated shows that there is a relationship between the well water and the aquifer that feeds Henderson Creek. It is in the interests of the community residents who are seeking to restore the creek, to find ways to manage water in the area, so that the aquifer is protected. In the regional district of which Oceanside is a part it is in the interest of the community to minimize the use of water from the nearby reservoir that provides adequate safe water to all the residents only with some difficulty. The issue of the provision of water to some 30 homes in a rural area of Oceanside has far reaching implications. It is one more in a recent series of events that points out our need to become much more aware of how we use the precious resource of water.

This issue also is of interest to the larger community because it demonstrates how the conflict between urban and rural development can find itself played out over the issue of a limited resource on the island: fresh water. The Saline Drive residents feel that they have the right to safe and plentiful water just as all the other citizens of Oceanside. They perceive that the most efficient and cost effective way for this to happen is to have a watermain extended to their area. The community members who oppose the watermain extension claim that there are alternatives to the watermain extension that have not been fully examined. This group is against urban encroachment in the area, so they see any watermain extension as an invitation for the residents to subdivide their large properties, thereby increasing the population density in the area. The solution to this problem must involve a decision-making process in the community that is perceived as being fair, and the clear identification of the development goals of the area.

Once development guidelines have been put in place, the water problems will be able to be addressed as just that. It is clear that the community and its elected council needs to address the issue of the quantity and quality of the water for the residents of Saline Drive, but the present context of political wrangling is not going to lead to a solution that satisfies either of the groups. It seems that there indeed needs to be a process to resolve this issue that is satisfactory to all participants in the discussion. This will probably involve the identification of a development plan that is seen to be strong enough to withstand pressure of future councils to bow to the will of developers. There also needs to be a thorough investigation of the situation on Saline Drive, including the identification of possible individual solutions for those properties. From a community safety standpoint, the question of fire hazards needs to be addressed; in addition, the issue of water management in a larger context needs to be investigated. This should include a discussion of recovery of wastewater and sewage disposal in

the area.[13] However, as we have seen in the data we collected, the members of the community will closely scrutinize any scientific data. The data presented to form the basis for a final decision must include data collected from all experts in the area—scientists, water management consultants, and residents who live with the problem and residents who may have to share the cost of the solution.

The Saline Drive water controversy is not unlike other controversial issues that we have cited, where there is a competition for resources and where personal beliefs and values are threatened. In all these cases, boundary work is being conducted to separate what is to be taken as legitimate knowledge and expertise from everything else and to make legitimate claims to common resources into illegitimate claims. The fundamental issue is one between those who have both water and control versus those who do not have either access to water or substantial input in the decision-making process. This creates a situation of polarized viewpoints that express divergent special and therefore partial interests. As the residents expressed time and again, they experience suffering, which arises when a human subject (individual, group) feels isolated from the control over relevant life conditions, that is, feels subjected to life contingencies (Holzkamp 1991). Through the Oceanside West Voters Association, the Saline Drive residents have repeatedly expressed their concerns, the special interests of one group of citizens living in a part of the municipality with a particularly "rural" character. However, the formation of special interest groups for the sole purpose of advancing one partial interest over another partial interest will neither solve the problems nor strengthen special interest groups (Holzkamp 1979). In compromising, each group (town council/mayor, residents) would have to give in a little (thereby losing a little face) by simultaneously attempting to impose their own visions on the corresponding other. In the end, however, the compromise would lead to greater perceived advantages of one group over those accessed by another group. Such an approach does not address the real issue, the pursuit of *common* interests.[14] What then is needed to overcome the apparent stalemate of the situation?

Clearly, the Saline Drive controversy is crying out for distributive social justice. However, the questions "Who gets what?" and "On what grounds does

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[13] In the neighboring community, the town council decided to connect a residential area with many characteristics of Saline Drive to the community sewer system, against the wishes of many residents, thereby opening up the possibility for subdivision and development. Access to a resource (sewer system) and development were two of the major issues debated. One of the present authors was engaged on the loosing side of the issue.

[14] Brian Martin pointed out to us that sometimes there might not be such a solution because, even if power and knowledge inequalities were overcome, serious differences may remain. He suggested that in such cases, at least agreement over decision-making methods needed to be reached.

s/he get it?" cannot be solved by banding together for the purpose of opposing partial interests. Common interests are more important than partial interests; common interests require a sense of solidarity. Rorty (1989) argues that we have a moral obligation to feel a sense of solidarity with all other human beings (based on the fact of the contingency of culture, language, and community). Here, solidarity is not the recognition of a core Self that is common to all human individuals, the core essence of humanity. Rather, it is the ability to see traditional differences as unimportant relative to the similarities in the experiences of pain and suffering. Solidarity therefore involves a conversion from the use of "they" (as in "all *they* want is to develop the land") to the use of "we," a conversion from special, partial interests to universal, common interests. Thus, "our sense of solidarity is strongest when those with whom solidarity is expressed are thought of as 'one of us' where 'us' means something smaller and more local than the human race" (Rorty 1989: 191). Out of this conversion contingently develop new cultural forms of life and new vocabularies, both of which can be explained only retrospectively. Once we master the new cultural forms and language, we can figure out how the good things that recently happened served some more general good. In a truly liberal society, ideals are fulfilled by persuasion rather than force, by reform rather than revolution, by free and open encounters of current practices, and by suggestions for new practices. In such a society, all disciplines (rather than techno-science on its own) and feelings, desires, and values have their place within rational inquiry (Maxwell 1992) or "islands of rationality" (Fourez 1997). Pure science then becomes but a fiber, treated like other fibers (esoteric pursuits of music, drama, or literature) in the more encompassing thread of human life.

In part, the sorry state of the local aquifers is due to the impact that the straightening of the nearby creek has had and the continuous pumping of water for irrigation purposes. The decreasing quantity and quality of the water, as attested to by the residents who have lived at Saline Drive for up to 30 years, is an environmental issue. There appears to be injustice when environmental destruction consistently and negatively affects the lives, health, reproductive choices, and overall well-being of one group of people (here those who live in a "rural" area), while other groups (here those living closer to the high-density areas) consistently escape much of the burden of such destruction. The Saline Drive issue therefore also becomes an issue of environmental justice, a term used in the context of changes of the environment the "benefits" of which are born by one group of people whereas the burden are born by another (e.g., Gruen 2000). Environmental justice is about the fair or equitable distribution of environmental goods, services, and "resources." Injustice is exacerbated when those who actually benefit from and enjoy the goods that resulted from environmentally destructive production processes, do not pay all the costs.

Coda

We, the authors, come away from our study of the public process in our community thinking that substantial changes in the public and educational process are required to prepare citizens that can fend for their rights during public controversies, particularly when scientific and technological expertise are mounted against their case. Change will not come easy. At one point in our analyses, we found ourselves mired, having begun to empathize with the different actors and having begun to take sides. A majority on our author team held that distributive justice required providing access to safe drinking water, forcing the community as a whole to deal with the problem of potential development in other ways. A minority had begun to agree with the town council and the mayor, thinking that the Saline Drive residents wanted to enrich themselves through selling their properties that would tremendously increase in value.

We were able to get out of our problems (which we recognized to be like those that plague the community of Oceanside) by reasserting the right of all involved to speak and to be heard. We felt that our diverse backgrounds had allowed us to bring many different types of expertise to the table that not only enriched our discussions but also forced us to deal with different discourses, unquestioned assumptions, and forms of reasoning. It is the "we" of our collective effort that ultimately won over the juxtaposition of differences. We think that it is only through the development of a similar solidarity that the pitfalls of playing one special interest against another can be avoided. In such a case, it is possible that participants feel that they have been heard but still do not get what has been their way; it may even be that they change their ways because they recognize any contradictions that might exist between common interests and their own partial interests. We complete this study with the sense that a process similar to the one that got us out of being mired might help processes at a community level to become unstuck. Whether such a process transfers to other situations, especially those of a larger scale involving many more individuals and groups than those that existed on our team, would have to be tested in praxis.

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