

Looking Back on Love Canal

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Love Canal was a landmark episode in American history. The widely publicized citizen action there, well known even in high school curricula today, was the opening event in an upsurge of activism to protect people from toxic wastes. It was also the impetus for major federal policy, the creation of the Superfund program to clean up hazardous waste sites. For environmental sociologists and public health researchers, the crisis itself and Adeline Levine's book *Love Canal*¹ were major sources of inspiration. It is now more than 20 years since the evacuation of the community, a useful vantage point from which to reflect on the meaning of this event.



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One observer has looked back on the events of 1970s and 1980s and has drawn a decidedly negative picture of the role of the Love Canal citizens group and its allies. Allan Mazur's *A Hazardous Inquiry: The Rashomon Effect at Love Canal*² uses the metaphor popularized in Akira Kurosawa's classic film, in which various parties provide very different accounts of the same event. It's not a very applicable metaphor, since the diverse parties at Love Canal saw many different events over a considerable period of time. But the real problem with the book is that it is full of errors and misinterpretations.

Throughout the book, Mazur relies on wrong information in three ways. First, he argues that the Love Canal activists were wrong about the migration of

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chemicals and their health effects. Second, he tries to make key actors support his assertions. Third, he claims that central figures in the Love Canal crisis read his book in manuscript form and approved his telling of their stories.

First, then, the dispute over chemical migration and health effects: Mazur claims that Beverly Paigen (a geneticist who volunteered her time to conduct health studies) used simple hand-drawn maps to demonstrate disease clusters, and he then overlays his drawings to disprove Paigen's work. In fact, Paigen used the maps only as visual aids; her actual calculations of clustering were based on statistical models that were far more accurate than the maps. The dots on Paigen's maps show only the numerators for disease ratios. The denominator, in this case the number of people in the area, is crucial and is clearly not shown on Paigen's maps. Paigen and colleagues have detailed the findings of appropriate statistical analyses, using population data, in published studies, e.g., a 1985 study by Goldman et al.³ Mazur ignores this and offers his own interpretation based on an erroneous assumption that Paigen's survey homes were uniformly distributed throughout the area.

Mazur also errs on the migration of chemicals via swales (moist surface valleys or underground soil intersections). He writes about the swale theory as if it were a quasi-scientific idea. In a presentation in Buffalo in August 2000,⁴ Mazur even implied that the swale "moved around" in order to fit the citizens' need to make a point. Swales are widely studied in environmental science, and are known to be real pathways for chemical migration. Importantly, they are not "underground waterways," as Mazur asserts, but rather wet subsurface areas that do not have a definite direction of flow. Nor does a swale have to directly intersect a canal or other geologic formation in order for chemicals to migrate, since changes in hydraulic pressure can force chemicals to move underground. Mazur bases his claims about non-migration on an EPA study that was so roundly criticized by the Congressional Office of Technology Assessment that a new study was conducted by the New York Department of Health.⁵ Significantly, chemicals were actually found in the outer rings of houses showing that they had indeed migrated from the canal area (state and federal officials were only preparing to evacuate the innermost ring of houses closest to the Canal).

Mazur claims that Paigen's birth defects study showed no chemical-related causation, since the greatest yearly rates of birth defects were prior to 1973. In truth, this should not be an issue, since chemical dump-

ing had been going on before 1973. Mazur argues that another study, on low birthweight, was useless since there were no differences between Love Canal residents and residents of the upstate New York region as a whole. Goldman, Paigen, and colleagues argued that a nearby census tract provided a better comparison group, and using that tract they did find a greater health effect.³

According to Mazur, the chromosome study was also flawed, since residents were not compared to a control group. Beverly Paigen has written elsewhere that she tried to get federal funds for such a controlled study, but could not; such research might have enabled more conclusive results.⁵

Even when Mazur doesn't refute health effects, he downplays them. For example, another study looking at child health effects, comparing more toxic "wet" and less toxic "dry" areas, found that Love Canal children in wet areas had elevated numbers of seizures, learning problems, hyperactivity, skin rashes, eye irritation, abdominal pain, and incontinence. Yet Mazur argues that the wet-dry distinction in exposure/control areas produced few significant correlations.

Mazur claims that fetal damage rate findings in the health studies were also flawed since damage could occur due to other factors such as smoking, and since there were not enough cases on which to make an analysis. In fact, that study looked at 947 pregnancies, quite sufficient for the statistical analysis. Further, the analysis controlled for smoking as a potential cause of fetal loss.

Second, the claim that key players acted in opposition to the Love Canal activists: One key actor who Mazur claims was critical of the health studies is the late David Rall, a former Assistant Surgeon General who was head of the National Institute of Environmental Health Sciences from 1971 to 1990. Mazur says Rall was very critical of Beverly Paigen's health studies. But, in 1998 Rall wrote to Harvard University President Neil Rudenstine that Harvard University Press made a big mistake in publishing Mazur's book since it was full of inaccuracies.⁶ Rall points out in that letter that chemicals indeed migrated past the inner ring and that indeed dioxin is a potent human carcinogen.

Third, the matter of Mazur's claims that key actors "vetted" his writing about their perspective: Beverly Paigen, for one, wrote back to Mazur that many facts were wrong or distorted and that he could not claim her as a "reader" who had approved the material.⁷ Adeline Levine, the first sociologist to study Love Canal, also reportedly told Paigen that Mazur misrepresented her competence and integrity.⁷

It is interesting that in this re-examination of the Love Canal health studies, Mazur relies on personal disparagement of key actors. Mazur claims Paigen was not qualified to conduct health studies since she is not an epidemiologist, when in fact she has held NIH grants in genetic epidemiology and has published her research in major journals. Mazur consistently casts the Love Canal activist leader Lois Gibbs in a negative light, showing her as an opportunist who has no respect for science or governmental authority. What of Gibbs' stature as a recipient of the prestigious Goldman Environmental Prize? Does Mazur really intend to smear this woman who has been a beacon for countless people, organizations, and communities that have been the victims of an ongoing toxic waste crisis? What could be the point in this, except to discredit the whole movement?

Mazur is simplistic in his assertion that "the scientific study of Love Canal looks more like a prize fight than a search for truth." Mazur should not be surprised that there were strong conflicts over how to gauge toxic health effects; researchers have continued to debate the best methods to study the health effects of toxic exposures since Love Canal.^{8,9} It makes sense for academic researchers to examine the nature of such conflicts, and to discuss methodological problems such as small sample sizes and multiple exposures. But it does not make sense, as Mazur does, to totally discount health studies because of suspected bias arising from lay involvement. If this criticism is applied, we would have far fewer environmental epidemiology studies, since in many cases state and federal agencies neither fund nor conduct such studies, and residents are the only ones who can carry out the work.

At the bottom line, the reader may ask whether the Love Canal health studies were perfect research products that showed without doubt that toxic chemicals caused substantial illness. And we would have to answer that no studies are perfect, especially in light of inadequate research funding, but the Love Canal studies do show evidence of toxic injury. Residents of contaminated communities are forced to bear the burden of proof that chemical companies and government regulators should be required to bear. With few resources, with a generally hostile science community criticizing them, and with the physical and emotional strains of caring for sick families members while they do their research, these residents are exemplary in their search for scientific knowledge. Perhaps there are some cases where alarms are raised that later turn out to be overstated, such as the risks of Alar as a pesticide for apples. But overall, without Lois Gibbs and her Love Canal

neighbors and without the many similar people in communities around the country, we would be even more than we are now at the mercy of an industrial system that recklessly uses dangerous substances.

Given what environmental researchers now know about the role of chemical companies in withholding clear evidence of health effects, one must wonder why Mazur would go out of his way to provide equal time to Hooker Chemical's account of Love Canal. Mazur contends that Hooker committed no crime, nor did it act out of bounds of industry standards, nor behave badly by donating for \$1 the seeping chemical lagoon for a school site. Nor, Mazur continues, did the Niagara Falls School Board do wrong in building a school on a known toxic site, since other schools in the state were being situated on similar sites in that era.

Now that Mazur has developed a model for research on social movements, how about "Rashomon at Montgomery" in which we revisit the Montgomery Bus Boycott, which helped launch the civil rights movement? We will hear reports from all sides about their divergent experiences, and in the process learn that the bus driver, police, and judge had different interpretations from Rosa Parks's. We might easily argue that segregationists were doing nothing illegal or out of the bounds of normal practice for those times. Maybe we will even find out that there were disagreements among boycott organizers over strategy. Then we can use this to rewrite the history of the civil rights movement as confused and wrongheaded.

If we allow a rewriting of the history of Love Canal, we might now doubt some of the key lessons that the citizens' environmental movement learned from this episode. We might also distrust the leadership of Lois Gibbs and the national Center for Health, Environment and Justice, which she now directs and which has been carrying on a vital campaign to explain the current dioxin risks to the American public. Her own recollections of Love Canal have been published in *Love Canal: The Story Continues*.¹⁰ When national environmental policies are being second-guessed by a new administration and rescinded because they are alleged to be based on "flawed science," it is worth remembering how similar tactics have been used in the past to the detriment of the health of all.

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