

# Multiple Chemical Sensitivity Syndrome and “Traditional Concepts of Architecture”

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Fig. 1. The Pitman house, Wimberley Texas.

## DEFINING MCS

Multiple Chemical Sensitivity Syndrome or MCS (also labeled as Environmental Illness or EI, Environmental Hypersensitivity, Chemical Hypersensitivity Syndrome, Ecologic Illness, and 20th Century Disease.) is a controversial medical condition yet to be fully understood or even accepted as a diagnosis. In their recent book *Chemical*

*Exposures: Low Levels and High Stakes*, Nicholas Ashford and Claudia Miller cite two tentative definitions from opposite ends of the medical community spectrum:

Multiple Chemical Sensitivities (MCS) is an acquired disorder characterized by recurrent symptoms, referable to multiple organ systems, occurring in response to demonstrable exposure to many chemically unrelated compounds at doses far below those established in the general population to cause harmful effects. No single widely accepted test of physiologic function can be shown to correlate with symptoms.

- M. Cullen “MCS: Summary and Directions for Future Investigators” in Cullen (ed.) *Workers with Multiple Chemical Sensitivities, Occupational Medicine: State of the Art Reviews*. (1987)<sup>1</sup>

Ecologic Illness is a chronic multi-symptom disorder, usually polysymptomatic, caused by adverse reactions to environmental incitants, modified by individual susceptibility and specific adaptation. The incitants are present in air, water, food, drugs and our habitat.

- Working definition of the Journal *Clinical Ecology*<sup>2</sup>

What these definitions really have in common is their vagueness. Both the sources and the symptoms of MCS are diverse and elusive, often involving low level exposure over long periods of time and multiple, seemingly unrelated physical complaints. The symptoms range from headaches, dizziness and impaired mental function to rashes to intestinal and other organ malfunctions. In the extreme MCS can be completely debilitating and even partial recovery can take years.

It is this range of potential causes and expressions of MCS, along with the fact that unlike traditionally understood allergies no single immune system abnormality can be located, that has made its diagnosis controversial in the medical community. The mainstream medical establishment in the United States does not recognize MCS as a valid diagnosis, and many doctors consider it to be an illusory psychosomatic illness. On the other hand, little has been offered in the way of psychological cures, and the medical

communities of Canada, Great Britain and many European countries do recognize MCS as having a potentially physiological basis. More directly relevant to our purposes as architects is that MCS is gaining *legal* standing in the U.S., as one of the case studies illustrates. That case study is a HUD funded low income housing project for people with disabilities built specifically for MCS victims.

The magnitude of the problem is also in question, though many indicators suggest that chemical sensitivities are widespread and growing. Ashford and Miller cite a claim by the National Academy of Sciences that 15% of the population may experience 'increased allergic sensitivity' to chemicals.<sup>3</sup>

Finally, while a review of the medical literature highlights the controversial nature of the diagnosis, all parties involved seem to have recognized the current stalemate and reached consensus on the specific types of additional research that need to be undertaken. Ironically, with the medical problems of the Gulf War Veterans being seen by many as MCS, this research appears likely to be done sooner rather than later. My own Interview of Claudia Miller at The University of Texas San Antonio centered around an impending grant proposal to the Army for just such baseline research.

## MCS AND ARCHITECTURE

The condition of being chemically sensitive is related to the discipline of architecture in two complimentary and important ways. first of all, the causes of MCS are assumed to be environmental. Ashford and Miller categorize the medical literature on low level chemical exposure into four groups, each tied in some way to the design and production of the built environment:

- 1) Industrial workers, 2) Occupants of "tight Buildings," including office workers and school children, 3) Residents of communities whose air or water is contaminated by chemicals, and 4) Individuals who have had personal and unique exposures to various chemicals in domestic indoor air, pesticides, drugs, and consumer products.<sup>4</sup>

As Ashford and Miller point out, these categories and the upward trends in the frequency of complaints have been correlated by many investigators to the chemical revolution following W.W.II and in more specific ways to the creation of tightly sealed and synthetic filled environments following the 1973 energy crisis.

In my own research, of ten chemically sensitive people interviewed who felt that they could identify the causes of their illness, seven spoke of exposure to agricultural, lawn or household pesticides. Moving into a new energy efficient house or renovating an old house was second in importance and mentioned five times. Nine of these ten were women, which is slightly higher than the statistical average cited by Ashford and Miller of 80%. All claimed to have lived normal, healthy lives to some point in adulthood. One woman, Susan Pitman, had two children who also became



Fig. 2. The Oetzel house, near Wimberley Texas.

chemically sensitive when the family moved into a new energy efficient house in a pesticide dependent upscale Chicago suburb in 1977.

The complimentary reason for architectural interest in MCS is that the preferred therapy is to simply remove oneself from environmental irritants by changing one's living situation. The houses that I have documented have been created by their owners as 'refuge environments,' built to the exacting standards of their bodily sensitivities to indoor air quality and other related issues.

## Three Agendas for Future Work

There are three tasks that this research suggests that I would like to identify in passing. The first is to codify a series of design guidelines for the production of these 'refuge' environments. This is the work that the people in the MCS community that I have dealt with are most anxious for. I will mention here only one point, which I consider to be the fundamental insight that I have gained to date concerning the appropriate path that an architect might take in working with a chemically sensitive person. That insight is that *each case of sensitivity is unique*. This means that while there are general categories of concern for an architect there can be no assurance of a simple list of

do's and don'ts. Each material choice must be verified by testing and the entire interpersonal process of design and production must be carefully undertaken and overseen.

The second task is to clarify the relevance that this design specialty has for the discipline of architecture as a whole, and for the definition of 'environmental quality' as the organizing theme of this conference. Here the flip side of the observation above is that while you cannot deal with the specific case through generalities, there are in fact generalities that can be drawn from the specifics of responding to MCS that are relevant for the production of any environment.

It is an easy case to prove this larger relevance of the work, though I will not attempt to do so in any detail here. Briefly, these environments are directly useful as 'extreme case' examples of many architectural issues. There is a continuity between the problems of the chemically sensitive and the complaints of the general population concerning Sick Building Syndrome, and there is a continuous spectrum of solutions to these complaints. MCS environments represent a wealth of field experience in the pursuit of healthy indoor air quality; in the selection of materials, the reform of construction practices, in the application of energy efficiency and air filtration technology. Importantly for the discipline of architecture, many of these issues return the questions of environmental and biological degradation control back from the realm of chemistry to the realm of design and detailing.

The third task, and the one that I find the most difficult and the most interesting, is to examine the representation of these individuals and environments in the cultural and political arenas struggling over the definition of an appropriate architecture, which is also a theme underlying this conference. This might be thought of as the 'post-modern' question... questioning the underlying value structures in any prescriptive claim and in any representation of a point of view, highlighted especially by the mainstream representation of minority views, which the views of the MCS community most certainly are. The goal that the research set out to ultimately to achieve was this; to critique the use of these extreme case environments in the debate over the direction that architecture should take in response to the environmental crisis. My concern was and is that images of these refuge environments and their authors have been used to characterize environmentally responsive architecture both in a positive and a negative light, but rarely in either event doing justice to the individual cases themselves.

This third general topic will also have to wait for a fuller treatment. For now I would like simply to raise one aspect of it for consideration; the issue of social conformity and non-conformity as presented by four of the case study houses. This question itself has at least two aspects; general and specific. The general question that is put to me repeatedly is whether this research can be mainstreamed to improve indoor air quality across the board without being labeled as 'alternative' and thus limited in appeal. What, in the language of the conference, is the potential for the lessons learned here to meld with 'traditional concepts of architecture?' The specific cor-



Fig. 3. Barhaven Community Housing for the Environmentally Hypersensitive, Ottawa, Ontario.

ollary to this question is that the people with MCS who have built these houses are often quite anxious to escape just such a marginalization. They are necessarily isolated and often ridiculed because of their illness, and the environments they create respond to this social dimension of the problem as well as the physical dimension. But is that response itself predictably 'conventional?'

#### **CONFORMITY AND NON-CONFORMITY: FOUR HOMES IN TWO DIVERSE CLIMATES The Pitman house, Wimberley Texas.**

Characterized by the themes of outdoor living, radically simplified materials palate, and fanatical attention to addressing insect and mold prevention architecturally without pesticides, this beautiful country house is considered atypical and odd even by others in the MCS community around Wimberly, Texas. The house is essentially a large dog-trot log cabin, with one block containing all of the wet functions such as the kitchen living room and bath, and the other block reserved for sleeping. It is radical in its relation to the natural setting and particularly in the lifestyle that the open plan enforces. Just this radicalness is what seemingly has solved the problems of material selection, ventilation and mold control so effectively. (see Fig. 1) Sue Pitman, designer.

#### **The Oetzel house, near Wimberley Texas**

Mary Oetzel is a consultant for the chemically sensitive who characterizes her own approach as concerned with material substitution and attention to the construction process, adapting conventional dwellings to the needs of the sensitive individual. This house is made distinctive by its use of full cement plaster walls and tile floor in a full mortar setting bed, but otherwise its improvements are invisible to the casual observer. The house features outdoor living space as does the Pitman house. Here the space is a conventional patio constructed of carefully selected and installed non-irritating materials. (see Fig. 2) Mary Oetzel, designer.

### Barhaven Community Housing for the Environmentally Hypersensitive, Ottawa, Ontario.

This project is a seven unit building in a larger social housing project. As multiple unit low income housing for the chemically sensitive it is the first of its kind and has been occupied for less than a year.

Of all the work documented Barhaven is by far the most architecturally radical in its reconsideration of issues of material and detail. It is characterized by the simplification of all assemblies to offset higher material costs, the elimination of all possible construction cavities and complete access to appliances and ductwork for cleaning. Barhaven is severe in its resulting material palate, which consists of exposed concrete block and Bass wood partitions with polished concrete floors. This severity has proven to be quite controversial with some advocates for the chemically sensitive in the Ottawa area, while other's reactions have been quite positive. The Canadian Mortgage and Housing Company (CMHC) is currently conducting a sociological survey of the occupants experiences with the structure as part of its commissioning. (see Fig. 3) Philip Sharp Architect, Ltd. architect, Drerup Armstrong Ltd. general contractor.

### The Nelms House, near Carp, Ontario.

A super-insulated R-2000 house with hard surfaces and natural interior finishes throughout. The interior surfaces are cement plaster on metal lath. The house is carefully zoned and ventilated, which in addition to the use of color and the capture of daylight were central to Catherine's successful recovery, especially in this harsh climate.

The Nelms' house represents an inverse of Barhaven in the same way that the Oetzel house is an inverse of the Pitman house for the mild climate of central Texas; it is a luxurious traditional house where more expensive materials and details solve many of the problems of indoor air quality without seeming at all unusual. Though the house works well for an extremely sensitive individual, it was designed so that it would retain its resale value in a conventional market. (see Fig. 4) Allen Drerup White Design and Construction, architects and builders.

### CONCLUSION

These four houses suggest that in any extreme of climate the potential exists to create environments acceptable to a chemically sensitive client without necessarily challenging our conventional image of housing. On the one hand I must then answer *yes*; the range shown here demonstrates that these environments need not be stigmatizing, and the issues that they raise can be assimilated into conventional practice in the broadest possible way.

And then on the other hand I must also answer *no*, in order to defend not only those people who choose to explore more unusual solutions but to argue for the potential of this specialized study to convincingly challenge convention. What is sacrificed in the equation of this special discipline of design-

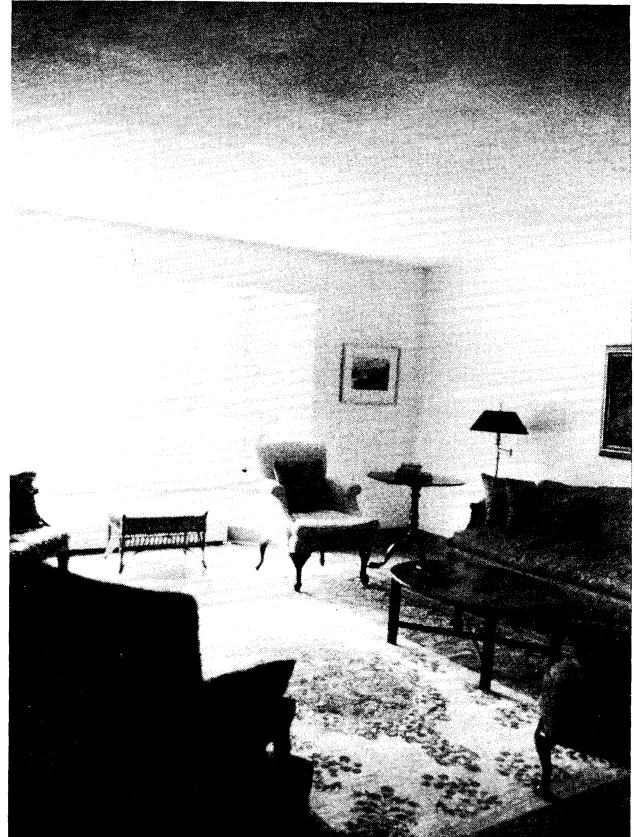


Fig. 4. The Nelms House, near Carp, Ontario.

ing for MCS with a certain technical expertise that can be assimilated to any set of social norms is both a critical social stance and a particular role for design as a problem solving activity. The radical solutions are just that; more fundamental, more comprehensive, more radical. The Pitman house and Barhaven go much further than the others if not in eliminating environmental irritants then in doing so in a way potentially consistent with other broader environmental concerns.

This returns me to the theme of the representation of difference and the post-modern critique of concepts such as 'progress' that have given modern architecture its moral compass. Put negatively, should the insights gained from the study of these extreme case environments become the next list of technological determinants to shackle design? Or alternatively, does the reality of the environmental crisis illustrated by the growing presence of MCS argue still for a conception of design as a progressive force concerned with innovation, reclaiming for modernism an early and holistic concern for accommodating and giving expression to innovative lifestyles? I will leave the question open to debate.

### NOTES

- <sup>1</sup> Ashford, Nicholas and Claudia Miller, *Chemical Exposures: Low Levels and High Stakes*. New York; Van Nostrand Reinhold. 1991. p.27.
- <sup>2</sup> *ibid.* p.28.
- <sup>3</sup> *ibid.* p. xvi.
- <sup>4</sup> *ibid.* p. 3.