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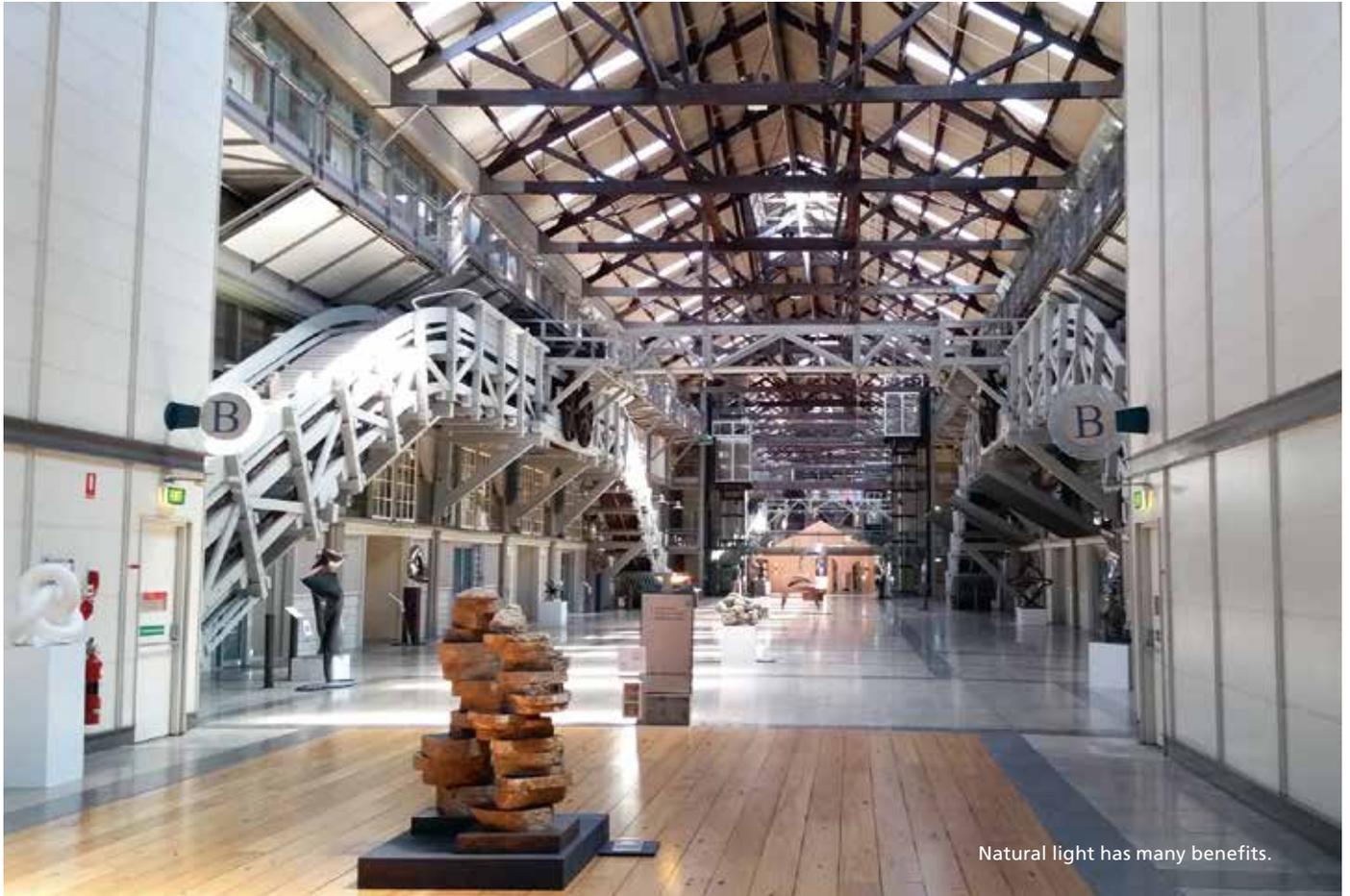
Ecolibrium

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Q&A: Lisa Heschong



Natural light has many benefits.

Ecolibrium editor **Matthew Dillon** breaks bread with a pioneer in exploring the relationship between the built environment and the health and well-being of its occupants.

Ecolibrium: Could you tell us a little bit about how you reached where you are today?

Lisa Heschong: When I was an undergraduate at UC Berkeley, in the late 1960s and early 70s, I was enthralled with the relatively new field of ecology, and eventually got a B.Sc. in “Conservation of Natural Resources”.

Later, in pursuing my Masters in Architecture at MIT, this background in biology and systems thinking led me to a number of passions that continue today. One could say this was an early interest in “sustainability” in all things, a concept that was not yet current.

My background in biology and ecology led me to focus on the relationship of the built environment to the health and well-being of its occupants – humans, plus the plants and animals around us.

One of my earliest jobs at MIT was assessing the impacts of development on watershed health. I also helped run a laboratory course in microclimatology for architecture undergraduates. This gave me a rather unusually scientific approach to design. At the same time, I loved all the cultural aspects of architectural design: the idea that we should design our built environment to be supportive of the social life of a community.

My previous travels, to India, Spain, and Morocco, along with my own cultural displacement from the beaches of Los Angeles to the Back Bay of Boston, fuelled this interest in cultural factors. The summation of all these various influences was my master’s thesis, which became the book, *Thermal Delight in Architecture*.

Since leaving MIT, I have continuously looked for ways to further develop these ideas. I worked at a very innovative firm doing passive solar design in the late 1970s, building on my knowledge of microclimate, and then eventually moved back to California and became involved in school design, which brought many of the cultural issues to the fore.

Eventually, my husband and I turned to founding a consulting firm, the Heschong Mahone Group, or HMG, which focused

on research and policy development in support of all forms of energy efficiency in buildings.

Eco: How would you characterise your approach to work? What are the fundamentals to your philosophy and process?

LH: My appreciation for the complexity of ecological and biological systems is foundational to my work on many levels.

I have spent my career mostly working with engineers – who tend to be trained to do rather linear problem solving. Their fundamental tools are equations that have been developed for highly predictable outcomes. Uncertainty is rarely expressed, either culturally or mathematically. And the non-linear complexities of biological systems – with many intertwined feedback loops such as from competition, cooperation and co-evolution; or development, growth, learning and decay – are ignored.



Lisa Heschong

Ecological systems, on the other hand, are a very useful model for policy development, given all the competing interests, and cultural and structural factors at play. Ecological systems are also a useful model for the health and well-being of the occupants of buildings, where multiple outcomes are all desirable.

Recent discoveries about the microbiomes of buildings – i.e., the very active biology of our indoor air and its interactions with building surfaces, occupant behaviour, and maintenance procedures – will drive a renaissance of more biological thinking within the building professions.

Ecolibrium: Could you please give us some insight into your concept of “thermal delight”?

LH: Pleasure is one of the great motivators of humans, and thermal delight is a form of pleasure. Pleasure is a reinforcement system that our bodies use to help us make decisions that are most appropriate, given our evolutionary history. (That said, our evolutionary history is not always keeping up-to-date with our current technological options!)

Professor Richard de Dear at the University of Sydney has been doing some very interesting work on “Alliesthesia”, or the experience of thermal pleasure and



The Pompidou Centre makes a visual point of its HVAC prowess.

serving as a very concrete symbol of that empire's political structure and technical prowess.

In our modern era, many of the stories embodied in our built environment are about engineering feats of wonder. An indoor ski resort in Dubai certainly comes to mind. The Pompidou Centre in Paris makes a visual point of its HVAC prowess, almost as if it were a rocket launching pad for the precious artwork within.

My larger point is that simple human thermal experience can be used in many subtle ways to reinforce the cultural significance of places, from a well-placed gazebo in a local park to a skyscraper in Singapore.

Eco: Could you tell us why you think alternatives to the use of mechanical force must be developed to meet our thermal needs?

LH: The answer to this question is simple and should be obvious. We have limited resources on this planet, and a rapidly growing human population. Whatever we can do to increase efficiency, and improve sustainability, is a good thing. Wise cultures build for the really long term.

Eco: Is passive solar the future? Where has it worked well do you think?

LH: Passive solar design of buildings and cities, should just be considered basic good design. And by "passive solar" I include any design strategy that works to modify the local climatic conditions

displeasure, that help inform your body, whether a bit more cooling or more heating would be beneficial to maintenance of your body's internal temperature, i.e., thermal homeostasis. Taking this physiological perspective a step further, recent work in the Netherlands suggests that larger swings in thermal comfort conditions may also have benefits on long-term metabolic health.

One of my goals is to help give designers, of both whole buildings and their component systems, a deeper understanding of human biology, and how that can be used to our advantage to both design more efficient and effective systems, and simultaneously provide the gifts of joy and pleasure.

Eco: What do you mean when you say that our thermal environment is rich in cultural associations? What is thermal symbolism?

LH: Humans are great story tellers. We love stories almost more than anything – witness the worldwide impact of Hollywood movies – and we tell stories to explain almost every aspect of our lives. Ancient stories are preserved via myths, folk tales, religious texts and traditional performances. Modern stories continue to be generated as history, novels, scientific theories, video games, pop songs, and even "fake news".

Our built environment, from our cities to homes, are physical embodiments

of these stories. In more traditional, pre-technological cultures, the relationship between thermal comfort and cultural meaning is much more explicit and easy to discern. For example, the step wells of the intensely hot Gujarati desert in India are one of my favourite examples of a synergy between cultural and thermal experience. A gradual descent into the step wells' ever moister, cooler air is a memorably pleasurable experience, and strongly reinforces the importance of all the cultural stories carved into the stone walls and pillars of the well. Similarly, the ancient "thermae" baths of Rome provided a very focused thermal experience while simultaneously



Smart design endures over centuries: vineyard terraces in Switzerland.

to make them more amenable to human habitation, including daylighting, insulation, thermal inertia, radiant cooling, etc.

Step one in any design should be to take advantage of the local microclimate, terrain and building materials to make a more habitable environment. Almost all of these strategies are low-cost, low-energy and very long lived, meeting sustainability criteria. Once these passive approaches have been fully exploited, then “back-up systems” to augment human needs can be put in place, at much smaller scale and lower cost than “brute force” systems that are designed to provide comfort regardless of bad designs or bad locations.

A few years ago, I spent a delicious spring day walking the terraced vineyards of Chardon in Switzerland. I was amazed to learn that many of these terrace walls were originally built by the Romans to extend the growing season along the south-facing slopes down to Lake Geneva. That design decision has been working well for over 2,000 years. These chardonnay vineyard terraces were recently designated a UNESCO World Heritage Site.

Passive design works well anywhere people take the time to think through the local climate and culture, and avoid copying ready-made solutions from the other side of the world.

Eco: What are your favourite projects you have worked on and why?

LH: I would translate this question into “Which projects am I the most proud of?” Given that I have been primarily working as a researcher and consultant for the past 25 years, those “projects” are efforts to create better information for designers, and to impact policies and attitudes towards design.

In addition to the book *Thermal Delight in Architecture*, which still seems to provide inspiration to many, I am very proud to have opened up the discussion about the benefits of daylighting our buildings as both an energy-efficiency measure and an occupant health and well-being measure. I have basically been working on various aspects of daylighting research for the past 20 years, and I continue to find it deeply interesting and satisfying.

While I think designers are now fairly well convinced that a well-daylit building is a positive goal, there is still widespread

confusion about how to best execute a daylighting design and system. Most recently, I helped lead an international effort to establish a new set of daylighting performance metrics, using annual simulation tools and annual weather data, and based on field evaluations of visual comfort. The resulting publication, IES LM-83-12, describes the first two metrics intended to better quantify the human comfort and well-being benefits from daylight. Many more will hopefully follow, for example looking at glare, circadian stimulus, view quality, and occupant control.

Eco: What’s the most important lesson you’ve learned throughout your working life?

LH: Persistence. And persistently questioning common assumptions.

Eco: What is morale like for professionals working in sustainability-related careers in the US at the moment?

LH: There is great enthusiasm and optimism among those building professionals in the USA committed to sustainability. These folks have great comradery and motivation, creating a ferment of new ideas and possibilities. I saw a similarly creative environment when I visited Australia last year. From my perspective, great progress is being made. However, we do have to wonder if it is indeed fast enough, given all the other challenges we face.

Eco: What’s next for you, and what are your goals for the future?

LH: I recently retired from running our consulting business, so now I have more time for speaking and writing. I hope to continue to “make a little trouble” and help provoke thinking about healthy buildings.

Most recently I have been collecting evidence and arguments for the importance of increasing occupant access to window views in our workplaces.

I’ve noted that with so much interest in low-energy buildings, reduced window areas and novel window treatment technologies also may inadvertently compromise the quality and access to views to the outdoors. It turns out that window views may have even deeper cultural, physiological and cognitive benefits than *Thermal Delight*! ■