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OPINION

ACTIONS FOR ELEVATING THE EXPERIENCE OF ARCHITECTURE: A DESIGN CHALLENGE OF THE 21st CENTURY

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1. Biophilia and Biophilic Design

Biophilia, humankind's innate connection to nature, has infiltrated popular media in the past few years. You may have read about it in *The Guardian* (Balch, 2017), *National Geographic* (Howard, 2013), *The New York Times* (Margolies, 2019) or somewhere else. It's not a new concept and coverage is not limited to popular press. We are at a pivotal point in recognizing the relationship between the built environment and human health, and biophilic design has been identified as an essential philosophy to creating a better reality for us all.

Health and well-being have made their way into green building standards, corporate development strategies and urban planning treatises around the US and the world, in some instances specifically calling out biophilic design. The University of Virginia School of Architecture is home to the *Biophilic Cities Network* (Biophilic Cities, 2018), a global effort that "acknowledges the importance of daily contact with as an element of a meaningful urban life, as well as the ethical responsibility that cities have to conserve global nature as shared habitat for non-human life and people". To date, the Network has partner cities in the U.S., Canada and Costa Rica, the U.K. and Spain, Singapore, Australia and New Zealand. In Washington D.C., 'green area ratio' standards were adopted in 2016 as a municipal zoning regulation, and in New York City, supporting mental health and well-being through "biophilic environments" is among the Guiding Principles outlined by the *Department of Design and Construction* (NYCDDC, 2016).

Research initiatives at universities across the U.S. — from U.C. Berkeley and University of Oregon on the West, to the universities of Illinois and Kansas, to Harvard and RISD on the East — are focused on human health responses to biophilic experiences. While a few universities have entertained curricular programming on biophilic design, and many more have embraced the precepts of sustainable or resilient design, the shortfall — as alluded to by British architecture students in "A Call for Curriculum Change" (Architecture Education Declares, 2019) — has been the lack of a comprehensive design curriculum in terms of *how* methods of sustainability, resilience and biophilic design can be effectively integrated into design. Two ways to do that are to familiarize students with the human condition (for which they design) and the physics of building performance (for how they design).

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2. Health improves through biophilic design: let us teach it

To keep this essay focused, let's continue with an emphasis on biophilic design. One of the underlying challenges is that 'health' in technical terms is conventionally respective of life safety, indoor air quality and thermal comfort, and not inclusive of sensory perception and the psychophysiological experience of a building. However, there is now enough evidence in the public realm for architects to be able to confidently guide clients through design decisions that are informed by this knowledge (Browning *et al.*, 2014).

Foundational principles and practices of biophilic design can be introduced at the earliest stages of a student's education and professional nurturing. Such lessons and courses at schools of architecture (e.g., Univ. of Washington, Drexel Univ., Judson Univ., Ball State Univ.; Exeter College in the U.K.; Curtin Univ. in Australia) are being offered at the discretion of the instructor, often by visiting instructors or guest lecturers, and are thus not an enduring component of the curriculum. Most students who discover biophilic design are limited to external resources for knowledge and guidance, typically through continuing education courses and from industry professionals — the environmental consulting firm *Terrapin Bright Green* receives dozens of student requests each semester. Keeping up with the demand is becoming increasingly difficult.

Individual universities can incrementally rise to this challenge. However, promulgation of biophilic design by governing bodies, particularly architecture accrediting entities and institutes of architects, have the potential to affect pervasive change in the national curriculum. This call to action is thus meant to help establish baseline knowledge and skill requirements on how buildings impact people and the precepts of biophilic design.

3. Establish biophilic design through accreditation

A cachet of this magnitude may be indicative of a paradigmatic shift towards social responsibility and ecoliteracy in both education and professional practice, or of the collective adjuration for improvements to and accountability for designs that foster salutogenic, socioeconomic and environmental resilience. In either case, entities like *National Architectural Accrediting Board* (NAAB) and the *American Institute of Architects* (AIA) in the United States, the *Architects Registration Board* (ARB) and the *Royal Institute of British Architects* (RIBA) in the United Kingdom, and others who declare biophilic design as a core competency will have a material impact on the architectural profession and the benefactors of generous building design. With this in mind, here are a few enhancements to the 'abilities' and 'understandings' to be inclusive of biophilic design as a requirement for program accreditation or validation.

In the U.K., General Criteria for validation for RIBA part 1 and part 2 has, of note, General Criteria 5 (GC5), which calls for an "Understanding of the relationship between people and buildings, and between buildings and their environment...". A proposed adjustment to GC5.3 and the addition of a fourth criterion, GC5.4, mirroring GC5.2 in format (each respectively indicated by bolded text) reflect a strategy for integrating biophilic design.

The graduate will have an understanding of:

GC5.1 the needs and aspirations of building users;

GC5.2 the impact of buildings on the environment, and the precepts of sustainable design;

GC5.3 the way in which buildings ***perform and*** fit in their local context;

GC5.4 the impact of buildings on people, and the precepts of biophilic design.

These proposed revisions would be further substantiated through existing RIBA part 1 and 2 General Attributes (e.g., GA1.4 and GA2.4) as well as part 3 Professional Criteria (PC1.2).

In the U.S., where NAAB Student Performance Criteria (SPC) (NAAB, 2009) are required for every syllabus of an accredited program, similar revisions could be made to uphold a mission that "enhances the value, relevance, and effectiveness of the profession of architecture" (NAAB, 2018) and help to progress the incorporation of biophilic design into the national curriculum:

(a) A conservative measure would be to insert "biophilic design" (as indicated with bold text) into the existing language for SPC Realm B: "B6. Sustainability: *Ability* to design projects that optimize, conserve, or reuse natural and built resources, provide healthful environments for occupants/users, and reduce the environmental impacts of building construction and operations on future generations through means such as carbon-neutral design, bioclimatic design, ***biophilic design,*** and energy efficiency."

(b) Greater rigor would be achieved by forgoing this first suggestion in favor of crafting a new criterion, labeled "B.13", framed as either healthful, biophilic, salutogenic or similar in name but, most essentially, one that focuses on experiential quality. In illustration: "***B13. Biophilic Environments: Ability to apply the precepts of biophilic design with an emphasis on sensory perception and psychological, physiological and cognitive wellbeing.***" The ability to apply the theory of salutogenic architecture could of course be incorporated into this criterion as well.

(c) Further assurance of B6. Comprehensive Design being inclusive of health and wellbeing would be to interpose in its list of complementary criteria both the newly formulated "B13. Biophilic Environments" and the existing "A11. Applied Research: *Understanding* the role of applied research in determining function, form, and systems and their impact on human conditions and behavior".

Unfortunately, the timing of these recommendations is too close to when an update to the Student Performance Criteria is pending NAAB board approval for release in January 2020. Thus, it may be some years before these suggestions are to be incorporated. In the interim, architecture programs, as well as those for interior architecture and design, will need to rethink how sustainability, resilience, and health and wellbeing are treated — as adjunct or imperative.

4. Points to include in a new curriculum

With respect to biophilic design, the following learning points can be incrementally or wholeheartedly woven in to every curriculum and syllabus:

1. Basic human physiology as it pertains to the urban and/or occupant experiences;
2. Foundational science on nature, health and the built environment;
3. The principles of biophilic design are widely recognized to date (Kellert & Calabrese, 2015);
4. Baseline experiential narratives for common user groups;

5. One or more science-based pattern language for the understanding, discussion and creative exploration of biophilic design opportunity (e.g., *14 Patterns of Biophilic Design* (Browning *et al.*, 2014));
6. Synergies between biophilic design and indoor environmental quality topics (i.e., lighting, thermal comfort, acoustics)
7. Alignments between biophilic design and green building rating systems and standards (e.g., BREEAM, Envision, LEED, LBC, SITES, WELL); and
8. Common entry points for biophilic design in a project schedule (e.g., goal setting, owner project requirements, project narratives, design workshops, design reviews, post-occupancy).

Preparing students for the professional realities ahead—the public responsibility to create generous architecture, where health and wellbeing, sustainability and resilience are at the core of every design — will also necessitate systemic enhancements to the curriculum. Deans and directors, both at universities and in the workplace, may want to consider these actions:

- Challenge students and design teams to consider the impacts of their design decisions on both the user experience and the environment.
- Encourage or require that sustainability experts, environmental psychologists or similar be invited to critiques and reviews in both the classroom and the office studio.
- Require coursework or continuing education on (1) the human condition including basic human physiology, environmental psychology and cognition, and how architecture impacts perception and experience; and (2) the basic physics of building performance, and how positive and negative environmental impacts can be approached.
- Connect with other departments or centers of research to identify and encourage degree minors or certificates at universities and collaborative problem-solving at work.

The opportunities are vast, the impact vital to ensuring convivial communities. Corporations, research entities and early adopters are breaking down the barriers to broad application, but academic leadership is needed for genuine assimilation, rigor and fortitude.

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