Biological architectures:
Designing for Equitable Futures

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Architecture and urban design have enormous and long-lived impacts on our collective economic, social and environmental well being. The cities and buildings we have crafted over decades, centuries, and millenia, are some of the most egregious offenders in the ongoing anthropogenic climate crisis. Over their lives, the buildings architects design are responsible for approximately 40% of both energy consumption and carbon emissions worldwide.

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As we face the ongoing climate crisis, it is imperative that we transition away from finance-driven development that currently characterizes 'green design' towards a paradigm that values social equity and environmentally sound approaches over short-term financial gain. This necessitates a pivot away from traditional, linear design and building strategies that consider buildings as discrete independent entities, into a comprehensive, systemic and resilient approach to design. Social sustainability is especially important to develop in this context: sustainable design principles simply cannot be effective if they are only accessible to the wealthiest, most privileged sectors of society.

[3]
A systemic approach to design must include active work towards building social equity; the first step in this process is to include diverse voices in decision making processes. We need to expand, amplify and promote these voices if we wish to build equitable cities that respond to the complex and disparate needs of our local and global communities.

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Considerations of equity in development must extend past the anthropocentric worldview that has dominated architectural thinking since the days of Vitruvius. Biocentric principles allow for a reworking of our collective worldview to consider, account for, and value the millions of non-human species currently living on earth. Merely ensuring that there are sufficient renewable resources to accommodate each human on earth could result in a catastrophic global ecosystemic collapse. Ecologists calculate if 12% of the earth's biocapacity is allocated for other species, it should be sufficient to maintain systemic resilience. Today we use 175% of Earth's biocapacity each year for humanity alone.

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Biomaterials offer plausible material options in the pursuit of environmentally responsible design practice. Biomaterials are derived from living organisms and systems, and can be used as potential low-carbon alternatives to traditional building materials. As biomaterials are grown rather than extracted, in many cases, they can be developed as local crops, mitigating the energy and carbon costs associated with extensive transportation and processing.

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Substantial research, analysis, and theoretical work supporting a paradigmatic transition towards equitable design practices has been ongoing for decades. Examples include applied biomimicry, which takes design inspiration from biological organisms and systems, facilitating the discovery of unique and efficient solutions to design problems. Regenerative design is a more systemic approach that aims to restore, renew and revitalize energy and resources through design. The framework of regenerative design recognizes the complex, interdependent nature of ecosystems, and acknowledges the place of human community and economy within them.

Architects and architecture must acknowledge their historic and ongoing failures to meaningfully address social inequity and environmental sustainability. The cascading feedback loops of anthropogenic climate change necessitate a swift and emphatic transition towards a new paradigm of comprehensive systemic thinking in design. Through applied principles of biocentrism and regenerative design, and the use of renewable biomaterials, biological architectures are one of many possible trajectories towards an aspirational, equitable future.