

Urban Hub

Integral Urban Hub

Accelerating City Change in a VUCA World

a meta-pragmatic approach

Thriveable Cities

20

integral**MENTORS**

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Marilyn Hamilton
Guest Curator



In fullness and freedom

A series of graphic papers from integral**MENTORS** integral UrbanHub work on Thriveable Cities

Founder and Managing Curator
Paul van Schaik

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Patrick Geddes

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Books

V

Volatile

Things change continuously. What is true today isn't true tomorrow. Even the nature and dynamics of change change.

U

Uncertain

More than ever, we live with a lack of predictability and a prospect for surprise. It is impossible to predict how projects will evolve.

C

Complex

Simple cause-and-effect chains have been replaced by complex interconnected forces and events. Interconnectedness makes all things increasingly complex.

A

Ambiguous

You can easily find convincing but totally contradictory information for any assertion. Because of complexity and unpredictability the ubiquitous availability of information has created a mist in which it becomes increasingly difficult to find clarity.



Integral Sustainable Design

Mark DeKay

Accelerating City Change in a VUCA World

Regional Urban Expression via Climate-Responsive Design: prospects and limits through an integral lens

In 2020 we see trends of globalization, continued industrialization, centralization and corporatization. The effect is a smoothing out of the character and distinctions of buildings and urban design worldwide. This is exacerbated by concentrated sources of fossil fuel energy that have allowed cultures to increasingly disconnect from the local materials from which their indigenous buildings were constructed, allowing movement of industrial building products over distances inconceivable even a hundred years ago. The same fossil fuel use has driven mechanized artificial heating, cooling and lighting, disconnecting inhabitants from the natural forces of sun, wind and light that previously required builders to adapt to the local climate. The free flow of knowledge by electronic means has made the modern architectural icons of capitalism available in the most remote of places globally. This combination of forces is rapidly homogenizing distinctive built urban cultural expressions, while simultaneously forcing global climate change. Buildings alone are responsible for about 40% of energy use and greenhouse gases.

Can regional cultural identity be saved or will the future of architecture and cities follow the way of the ubiquitous white plastic stacking chair?

In solving the climate crisis by design, can we also recover a place-based built expression for the durable values of diverse cultures?

It is well understood that halting climate change requires the shift to an economy based on renewable energy and materials. For buildings that means beginning with climate as a context and implementing bioclimatically appropriate design strategies in an *architectural regionalism*. Renewable energy production cannot supply fossil fuel era levels of consumption. Demand for energy will have to be radically reduced so that the distributed energies of sun-powered photovoltaics and wind



Fig 1. Entrepreneurship Development Institute, Ahmedabad, India, Bimal Patel, architect, breezy courts and shaded circulation in a composite hot climate. (DeKay & Brown, 2014)



Fig. 2 Wall Building, Resolute Bay, NWT, Canada, Ralph Erskine. A continuous solid wall building wraps a wind-protected community in an arctic climate. (DeKay & Brown, 2014)

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generators will affordably supply people's needs in buildings. The current professional targets move buildings toward carbon-neutrality and net-zero energy, the latter meaning that the building produces as much energy on site annually as it consumes.

In *Sun, Wind & Light: architectural design strategies*, 3rd edition, we use a hierarchical approach to designing for net-zero (Fig 3). "The hierarchy suggests solving the energy design problem with the lowest level of technology possible and the least cost strategies, while also substituting embodied intelligence in architectural form for hardware." *Designing* to fit the climate addresses the bottom three levels of this hierarchy. Since climate is a regional phenomenon, climate-responsive design generates variations in building form similar to how natural ecosystems and species are varied based on their underlying conditions. This stands in stark contrast to the flattening forces of architectural globalizations. Buildings in Miami and Marrakesh will be different; Stockholm and Singapore manifest as radically different expressions. Buildings designed to light with the sky, heat with the sun and cool with the wind and earth also provide one basis for regionally adapted architectural languages that give identity to the people living in particular places. The physical urban context determines the access for each building to the site-based resources of sun, wind and light. Fig. 4 shows how street orientation and block massing might be shaped to insure such renewable resource access while also accommodating the site and property variability already present in a city.

The famous Indian architect Charles Correa proclaimed that "Form follows climate." While this argument is, in integral terms, partially true, it is also evident that climate is not the *only* driver of building and urban form. We can also consider cultural practices, human activities, individual experiences (such as aesthetic experience), and materials and methods of construction as significant influences.

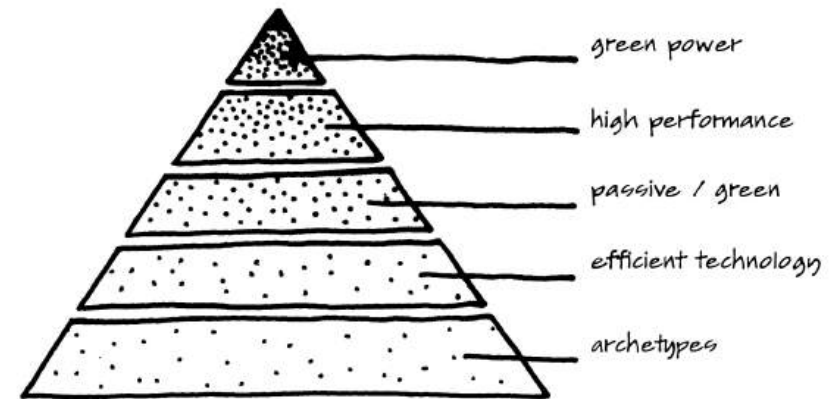


Fig. 3 Hierarchy of strategies for net-zero energy design (DeKay & Brown, 2014)

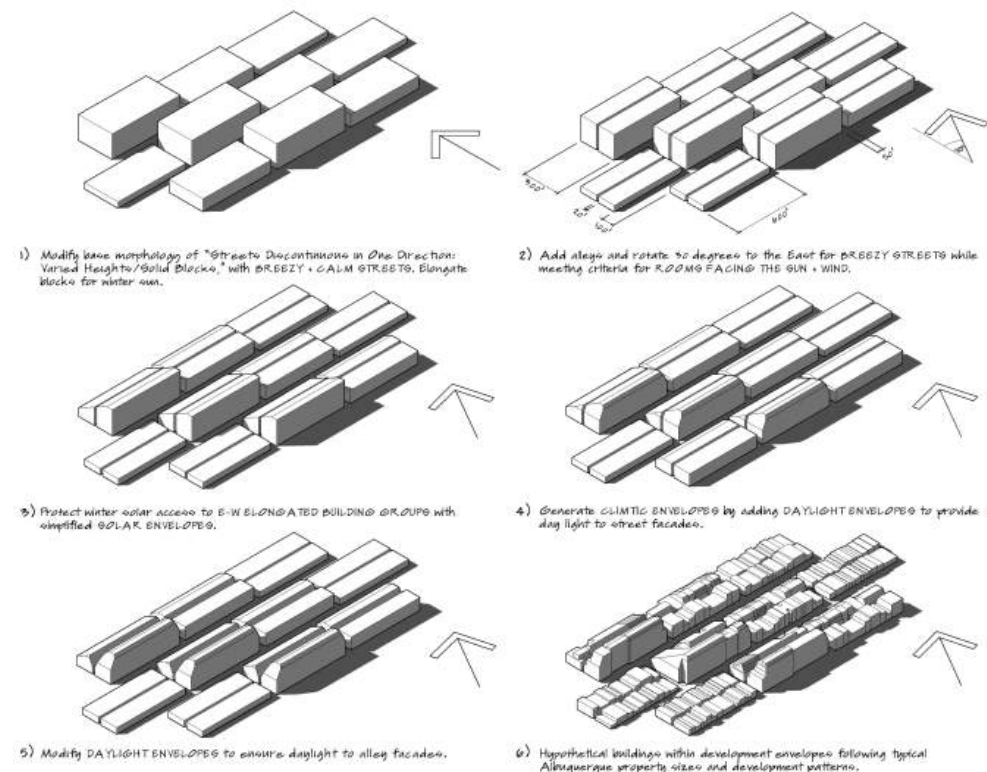


Fig. 4 Design sequence for optimizing access to sun, wind and light in Albuquerque, New Mexico. Study by Mark DeKay and Grant Joerger (2017)

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In *Integral Sustainable Design: transformative perspectives* (DeKay, 2011), we proposed that a designer's awareness required six fundamental intelligences (lines), each contributing to the generation of built form, whether it is a building or a city (Fig. 5). Climate, as a form-generating complex of forces, falls under "place and context" as an aspect of the situational Nature in which buildings are always rooted. In the same way that macro-climate is regionally variable from rain-forest to desert and tropics to the poles, each of the other processes that contribute their influence to process-form (Fig. 6), that is, Behaviour, Use, Experience and Thought has a regional or local dimension.

This raises the fundamental question:

How can we understand what is local, regional and universal among the progenitors of built form?

Modernism in design can be observed to have expressed in two broad modes: *internationalism* and *regionalism*. While we can now see the insanity of an international modernism of the same grids, single use zones, object buildings free of contribution to larger urban patterns, bias to automobile transport, etc.—a one-size-fits-all urban template—its lesser known alternative, regionalism, also conflates multiple scales into a singular dominant influence. For example climate, as a regional pattern is lumped into regionalism along with topography, a local site-specific variable. Fig. 7 Shows a sketch idea for a series of nested scales. Internationalism uses the same architectural forms, typologies, urban organizations, materials and technologies throughout the world, as if none of the lower scales of complexity have significant influence on what form and expression buildings and cities take. Most regionalists do the same within a region's geographic scope, yet climate, topography, culture, way of life, schools of thought, etc., vary within lesser territorial dimensions than a region. Contextual variability is exponentially inverse to territorial scope.

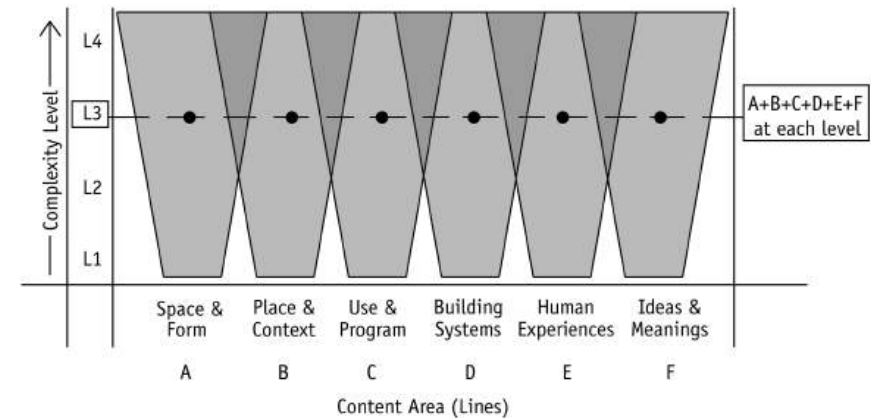


Fig 5. Six lines of design awareness, unfolding in complexity within the mind of the architect, but also already always integrated (DeKay, 2011)

Place-form	<i>shaping form</i> in response to contextual processes
Behaviour-form	<i>shaping form</i> to maximize performance
Use-form	<i>shaping form</i> to support patterns of human activity
Experience-form	<i>shaping form</i> to engender rich human experiences
Thought-form	<i>shaping form</i> to embody ideas and meaning

Fig 6. Types of process-form relationships in design (DeKay, 2011)

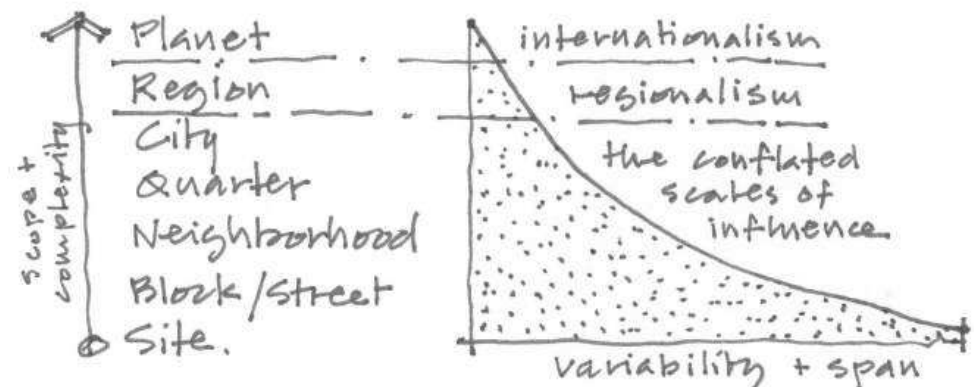


Fig 7. Scope and variability of built form patterns

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Each level of nested holarchic complexity can be understood as being constituted by relationships among patterns at a lower level. Each higher order pattern helps organize the ones below it. A generalized scheme for patterns of green infrastructure across five complexity levels is given in Fig 8 (DeKay & Moir-McClean, 2006). Boxes show patterns that our research focused on developing. In this way, regions extend their influence on form and organization one level down, not many. In *Sun, Wind & Light*, we use nine levels, from Materials (level 1) to Neighborhoods (Level 9). In integral terms, lower levels have greater span and number, but less extensive geographic scope, while higher levels have greater depth, fewer number and more extensive scope. We may now define two qualified design precepts.

Progenitors of built form influence the order of places downward in complexity.

Formal differentiation increases with span, not scope.

Therefore, what is universal in building and urban design is that which is the most invariable: gravity, human physiology, the organs of perception and the sub-cortical processing of sensation, the length of the solar year, and so on. An arch follows the same physics-based structural principles everywhere on the planet. No humans are over ten feet tall, so human scale matters everywhere, and our human sense of vertical and horizontal are invariant. At the regional level, macro-climate might provide similar conditions, for example in the

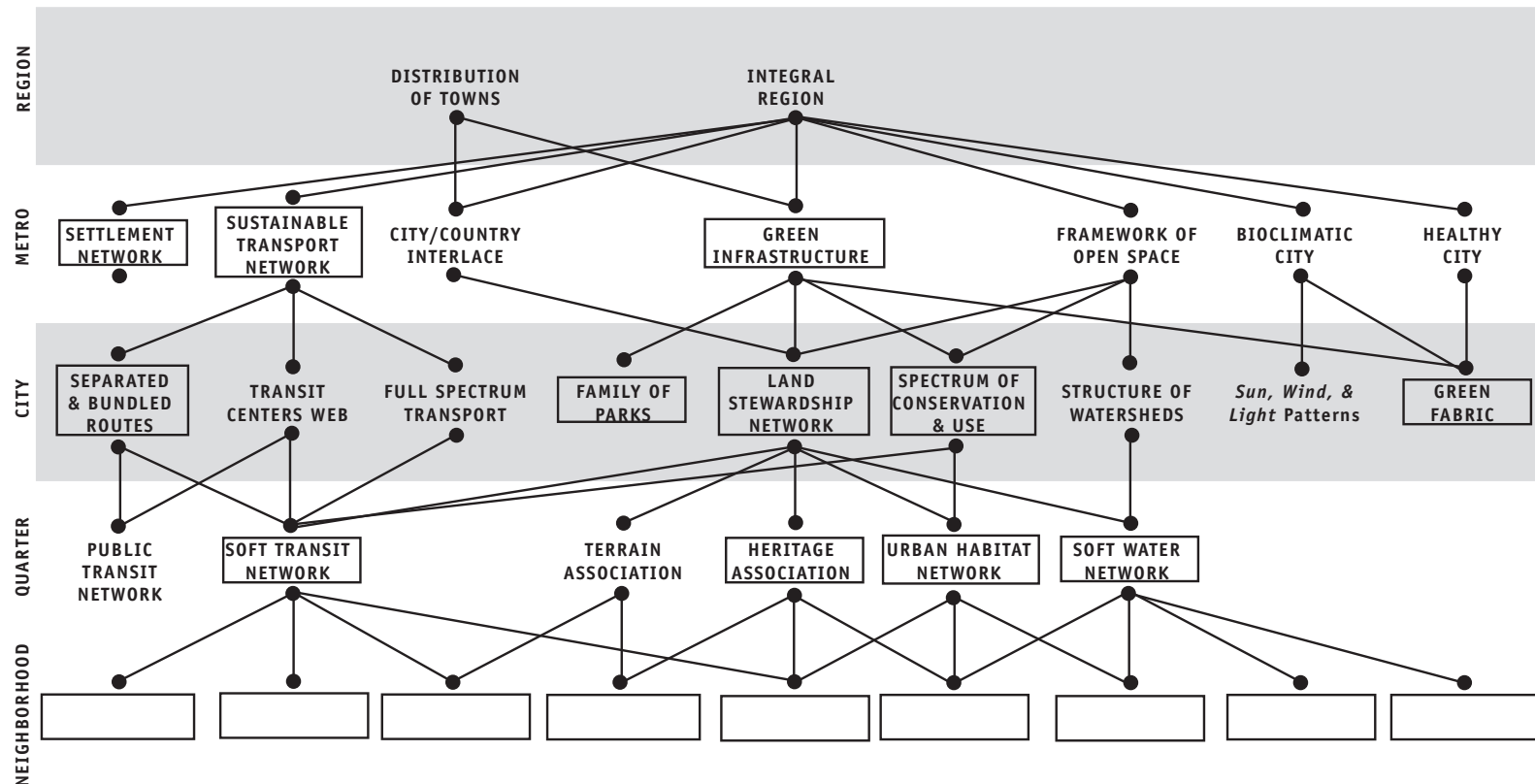


Fig 8. Map of high order green infrastructure patterns across scales from region to neighborhood (DeKay & Moir-McClean, 2006)

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tropics, while microclimates create significant variances. For example, the high altitude cities of Cuenca and Quito in Ecuador experience conditions referred to as “eternal spring,” whereas lower elevation might be the always hot-humid Amazon rainforest. Similarly, my home region is topographically called the “ridge and valley district” while individual building sites can be alternately relatively flat or unbuildable in their steepness. Topography is a most local type of progenitor.

The levels of complexity in our discussion so far apply *only* in the exteriors, to the right-side quadrants and not strictly to individual experiences or to cultural meaning. Fig. 9 was developed to help understand architectural experience (upper left quadrant) in its four-quadrant integral context (DeKay, 2020). Readers, if not familiar with Wilber’s model can undoubtedly find it explained in other papers within this volume. Levels of complexity in human artefacts are a lower-right systems affair, as are issues of life activities, ecology, urban infrastructure, etc. Scale, scope, geography, climate, materials, construction methods, finance, etc. apply to the right side empirical world where things can be measured and mapped.

Regionalist design theory recognizes that environmental conditions, such as climate and materials, are not the only drivers that can differentiate design in one place from that in another—and by doing so resist the erasure of difference and identity at work under globalism. Frampton (1987), in an influential essay on *critical regionalism*, addresses both the broader culture and “schools of thought” in the building community, along with the role of clients. However, few thinkers in this domain distinguish the [LR] scales of *nested networks* of systemic contexts from the UR basic environmental conditions. Neither do they have any awareness of [UL] *stages of consciousness* or have a powerful enough language to distinguish [LL] *worldviews*. Fig. 10 in a simplified way suggests some major progenitors of differentiated localized/regional urban built

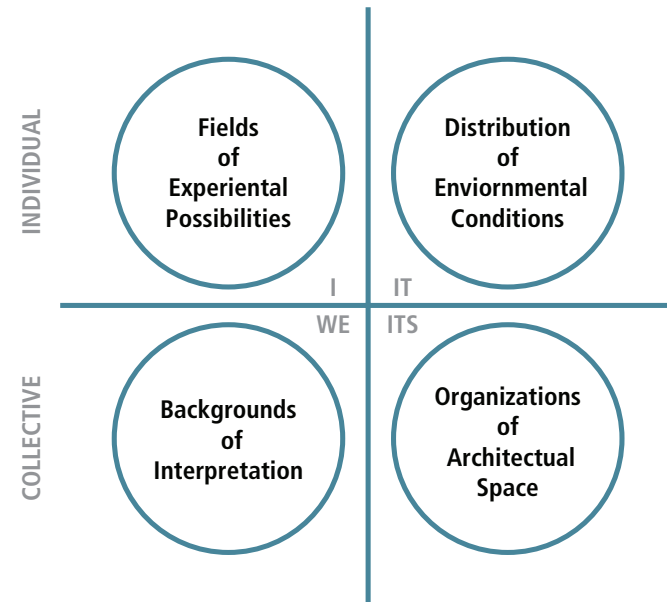


Fig 9. The integral context of architectural experience (DeKay, 2020)

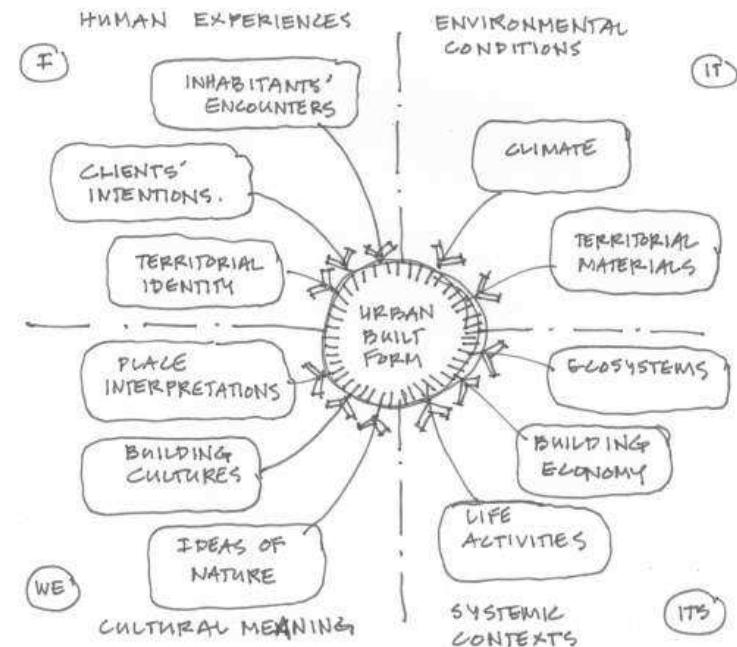


Fig 10. Major differentiating progenitors of urban form

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form as parsed into the four quadrants. Each quadrant in the diagram is a different primary orienting perspective in which the methods used reveal the phenomena studied in radically different ways. While the scope of this short essay does not allow the development of interaction details, such as the relationship between proximate materials, construction practices, the local building economy and its related building culture, for example, it can, however, serve provisionally to point towards the range of factors that may vary at regional and sub-regional territorial scopes.

Many observers have noted that powerful forces are at work, from global corporate capitalism to fossil fuel driven planetary transport to the media and internet transmission of seductive and consumptive images of modern and western lifestyles. Therefore, it is even more important that the *resistance* to these homogenizing forces that is presenced by an informed regionalism and localism (including bioclimatic design regionalism) become integrally informed.

One last issue is worth mentioning in brief, the common false dialectic between the Traditional and Modern, between conservation and progress and subsequently, progress as myth. *Past-present-future* is an improper continuum for a pragmatic theory of the city. Alternately, time is a vector in service to development in complexity and richness. *Preservation-maintenance-innovation* form an equally deluded if partially true trilogy. A city in development is a city in transformation, an ongoing process of evolution, a transcendence of the unworkable disasters of both pre-modern and modern, and now also postmodern, while integrally including their workable dignities in the creation of new orders. In the new city as complex integral artefact, the best of the past, generated by regional extent, limited technology and isolation, becomes the recognizable (thus relevant to continuity) constituent and foundation of the present form, shaped through the addition of its contemporary access to the knowledge of all cultures in all times.

Returning to the opening question of how a cultural continuity of architectural expression and regional identity might be maintained in the midst of rapid change, we end with the proposition that, with respect to design-with-climate:

Bioclimatic design articulates a place-empathetic formal expression, to the extent that

- *intelligence embodied in its configuration is allowed to substitute for hardware and fossil energy*
- *it is allied with a constructive material culture of necessarily limited geographic scope*
- *a hybrid form language is employed such that durable life patterns and values are retained in the transcendence of newer vocabulary fit to emerging conditions.*

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