Abstract
This paper presents a review and an historical perspective on the architectural metaphor. It identifies common characteristics and peculiarities - as they apply to given historical periods – and analyses the similarities and divergences. The review provides a vocabulary which will facilitate an appreciation of existing and new metaphors.

Keywords: metaphor, architecture, art, traditional or classical art, ancient prehistoric, modern and contemporary architecture

Introduction:

History is a metaphor of time, space and realities segmented into subjects and themes.

The history of metaphors in periods of architecture is one such reality. Thucydides said: “History is philosophy teaching by example” (Strassler, R. B (1942) and Santayana said: “Those who fail to learn from history are doomed to repeat it” (Santayana (1988). While so many important people have given their views on history, it is still a vehicle for communicating metaphors because each of these metaphors encapsulates and recalls the commonplace and artifacts of its time.

On the other hand, to modern art and architecture professionals, history is purposefully ignored in favor of new, innovative and contemporary expressions. Furthermore, while beauty is in the eye of the beholder, aesthetics is one of the commonplaces of metaphor. It is personally and culturally of its time and place but also has some relevance and utility to future generations.
In a sense, historians are cultural “voyeure” and they actively seek to compare their own metaphors with others. Do they do so in the belief they will find a yet undiscovered metaphor in the past which will give them a clue for the future? Or do they do it in order to clarify the metaphor of their own time? In either case, metaphorically, they are “carrying-over” and “transferring” from one time to another by the very act of making metaphors. As many study the Old Testament to find its law, so historians study history in search of truths: in this case metaphors and design. As architecture is the process of making of metaphors, correspondingly each period in history is marked by its own particular contributions.

Contemporary architecture is more about unseen and implicit metaphors, where the metaphor is between elements and factors of program, building technology and social context. It is more the essence of the architecture; the making of metaphors than that overview of the apparent historical evidence of these metaphors.

In his introduction to Robert Venturi’s, Complexity and Contradiction, Vincent Scully observed that 1966 represented an absolute break with pluralism and initiated the development of what he termed “cataclysmic planning principles”. In one lecture he observed that contemporary planners and architects had embraced the idea of destroying the past for the sake of the future. Whilst eminent domain and commercial interests often result in benefits for the public, they often do so at a price which neither the public nor the owners can sustain. By removing and replacing one structure with another, the encapsulated referent of the past in one context is lost forever. It is arguable that urban planning which accommodates free enterprise and a role for quasi-government landmark commissions is more productive in delivering financial viability and protecting the public good. Since Scully’s statement, such commissions have flourished and been
successful, in one sense referring to the replacement of landmarks with new buildings and in
another with the hegemony of today’s principles over those of yesterday.

Architecture as the making of metaphors is not new. For example, from Egyptian temples
and pyramids to today’s skyscrapers, design history is dominated internally and externally by the
reinvention and reinterpretation of classic elements. It is not uncommon for monuments, which
were originally designed for one purpose, to reappear or be replicated for an entirely different
one. So we see the Egyptian temple and Moorish palace as a cinema or the Roman and Greek
temple as a mausoleum or bank, perhaps originally designed with the mainstays of metaphors but
copied to partake of the righteousness, nobility and grandeur they represented. It is as if to say, as
they were, so we are. In each pre-modern period these works were appreciated, particularly
because they were the amalgamation of all the treasure, wealth, technology, arts and crafts of
their times (Miller, G. A). It is also true to say that they stand as a repository of human reason
and spirituality – a specific response to a given set of social, political and spiritual circumstances.

In psychology, “appreciation” is a general term for those mental processes whereby an
experience is brought into relation with an already acquired and familiar conceptual system. The
metaphoric works were as sensational as the edifices of the world’s affairs, as monuments were
to society’s triumph over evil, nature and adversity. However, in each period there are
exceptions, such as merchant’s buildings that stood above mass housing; mass housing never
nearly replicated the public buildings. It isn’t until later when mass housing, even in Greece and
Rome, replicated scaled-down versions of Greek and Roman temples and the applied stucco
decoration, rendering and false roofs of city townhouses emulated classic mansions. Even
today’s plethora of global subdivision housing and New England “salt shaker” houses emulated
the metaphors of the classic (Egyptian, Greek and Roman) ideals. I THINK THIS COULD BE BETTER EXPLAINED AND EXPANDED.

The commonplace to any one of most of history’s metaphors is the commonplace of the metaphor of them all; their collective metaphor; the metaphor they all have in common. That is, that by knowing one you know the others; that one speaks in terms of the other and that anyone or the collective make the strange familiar.

That is to say: the example of their commonplaces is turf (area of influence), identity, security, status, power, protection, shelter and religious purpose and use (such as rituals, teaching and networking). These commonplaces transfer from one to the other period in history and represent the collective commonplace of the history of all metaphors in different periods of architecture. In any case, “Metaphors simply impart their commonplaces” (Boyd, R (1993).

Whether central or decentralized, publicly perceived architectural metaphors are all about names, titles, and the access the work provides for the reader to learn and develop. They also symbolize the trade and value of its owner, users and society. In free- enterprise democratic societies where central government allows for sovereign citizens to contract, own land and build, there is a rush for them to emulate historical models to build identity, security, and status into the ideals of their metaphors. At its best the vocabulary of the parts and whole of the metaphoric work (building or work of architecture) is an encyclopedia and cultural building block. The work incorporates (is imbued with) the current state of man’s culture and society, which is like an “open book” for the reader. The freedom of both the creator and reader to dub and show is all part of the learning experience of the metaphor (Kuhn, T. S (1993). In the metaphoric period of the ‘60s, I coined the term “Pop Arch” to describe the phenomenon of “popular architecture”.

What are the commonalities and differences between one style and another and what does this show us about making and using metaphors? “Like any other work, architecture issues arise from the past; a past which is multi-faceted. There is first the past of the architect himself, his or her background, training, experience - and knowledge. There is also the whole history of the subject, for the architect, like every other artist, is brought up in the world of his art. Traditional or classical (non-primitive) art is based on what has gone before. Indeed, the most revolutionary changes are produced by men and women, who have a good acquaintance with the past, and want to avoid its limitations. The past may play a negative role, but it powerfully enters in. To put this in metaphoric terms, we can think of innovation and radical change as negative metaphors, where the past participates under a minor or negative sign” (Weiss, P. (1971). Examples of this can be found in the way Frank Lloyd Wright designed his buildings against the tenets of Louis Sullivan and used long span beams to let in the light and the way Queen Maria Theresa of Austria commissioned Schönbrunn (a multi-dimensional/multi- disciplined metaphorical masterpiece and a model for many generations thereafter (notably Versailles and Fontainebleau) as a contradiction to the over-sized styles of the Renaissance and to give a human scale to palace design which would cater for human needs and necessities (heating, convenient furniture, etc.).

“There is not only a past; there is also a future. No art- and certainly no architecture- is produced without some awareness of the future. This takes many guises. There is first the plan of the work to be accomplished and the function to perform. Is the object a church, a school, a pavilion, a cage, a roadway, a city?”(Weiss, P. (1971).

Like all impressive government buildings the treasury exudes the very wealth it aims to protect. A metaphor which still today translates into money-storage buildings designed to “appear” like
and be as impenetrable as any fortress – Fort Knox, Kentucky, being a prime example. Similarly, prisons are often designed as a mirror image of the original function of the fortress. Instead of repelling and protecting from an external threat, they contain an internal threat within their walls.

I ADDED THIS STUFF. I HOPE YOU DON’T MIND.

In each pre-modern period there was a passion to enamor the shelter with images to reflect the wealth, might and status of the kingdom or empire. Castles were not only the focus of feudal power and military might, they advertised status to the subject population and rival potentates. Crenellations and ramparts were metaphors bridging cannon, fireballs and arrow shots with stone. The building was designed as a fighting machine. You can see this very clearly on a visit to Castel Sant'Angelo on the Tiber River near the Vatican in Rome or, perhaps more impressively in the design of Krak des Chevaliers in Syria and the geometric works of Vauban. NOTE: Krak is one of finest castles ever built. It is ingenious. Similarly, Vauban’s fortresses reflect the need to protect against the increasing use of accurate and highly destructive artillery. They often appear like a series of carefully planned traps ready to ensnare the unwary or foolhardy. If the besiegers didn’t think it through, the siege of a Vauban fortress could lead the attackers to come under withering and sustained firepower.

Throughout much of art history, artists and architects were concerned with the proportions of the parts of their works. For example, if you were designing a temple, you might want to make the ratio of its height a particular value. In fact, there were not only particular ratios that were preferred but sometimes entire systems of proportions. Each period is remembered for its metaphors including its geometry and the method of proportioning. As proportioning and scale are related, the difference in the metaphor scale between colonial Williamsburg residences and European castles were very different. The proportions used by Michelangelo in his building
facades were reifications of his study of the scale and proportion of the human figure (Hugh, B. (1951).

In fact we can see a relationship between the metaphors of a period in the abstract quality of an ancient pyramid juxtaposed with contemporary geometric building designs. The dimension of the technical metaphor remarkably subdivides periods but none changed the paradigm as the indoor and stacked plumbing, structural iron and steel, elevators, electricity and mechanical heating and air-conditioning.

Ancient and prehistoric architecture is remembered for its caves and hieroglyphics while the creation and use of metaphors in architecture can be traced back to places like Tel Turlu in present-day Syria. Most early human shelters either took the form of a cave, or as evinced by settlements in the Near East, which date from 4300BC to 1100BC, the form of mandala-shaped ground excavations. The word ‘mandala’ means a circle in Sanskrit, the language of ancient India. It represents wholeness and can be seen as a model for the organizational structure of life itself- a cosmic diagram. For some the metaphor connects to earth energies and the wisdom of nature and for others as a device to capture the images of the countless demons and gods (Gardiner, S. (1974). NOTE: The Romans also had the idea of a Celestial Templum.

These are metaphors, in that they have two referents which liken themselves to each other and claim a commonplace. The very fact that mandalas are drawn in the form of a circle, can lead us to an experience of wholeness when we take time to make them and then wonder what they mean. In the strict use of the mandala, there is a central point or focus within the symbol from which radiates a symmetrical design. This suggests that there is a center within each one of us to which everything is related, by which everything is ordered, and which is itself a source of energy and power.
One can only surmise from the evidence and findings that, for example, one cave housed a collective tribe and within there were some who hovered together to secure for themselves one personal space (turf) (Brown, D. (1991). To be claimed, perhaps this place in the cave had to be identified, secured and addressed. Continuing the example, when this same group went and found its own cave, as did so many others, they may also need to be identified, secured and defended. Each time a metaphor talks about one thing (the tribe) in terms of another (the sign, the contour or location of the cave). Roaming away from the cave to the prairies, rivers and lakes, they dug holes in the ground to copy and “dub” the cave in the ground, they made metaphors of their cave and the mandalas. Each time something they can do with their hands (techne’) and their thoughts (concept); both the primary constituents of metaphor (Gordon, W. J. J. (1971).

The vertical side of the ground replaced the cave’s walls. They considered new concepts as being characterized in terms of old ones (plus logical conjunctives) by the circular mandala form; the metaphor-building clarified their location, status and value. Virtually every known spiritual and religious system asserts the reality of such an inner center (Pylyshyn, Z. W, (1993). “The Romans worshiped it as the genius within. The Greeks called it the inner daemon (a subordinate deity, as the genius of a place or a person's attendant spirit). Christian religions speak about the soul and the Christ within. In psychology they speak of the higher self” (Lakoff, G. (1993).

The Neolithic peoples in the Levant, Anatolia, Syria, northern Mesopotamia and Central Asia were great builders, utilizing mud-brick to construct houses and villages. At Çatalhöyük, houses were plastered and painted with elaborate scenes of humans and animals. The advent of
the city itself was a metaphor to the power, position and potential of the society. It was totally urban and metaphoric. Since everyone participated in their design and construction, its metaphors were both implicit and explicit. Metaphorically, this was the hand-technology era depending on what man could etch out of nature’s rock, soils and trees (Ching, F. (2006).
The scale of habitable metaphors is the intrinsic relation between the human figure and his surroundings as measured, proportioned and sensed.
It is dramatically represented by DaVinci’s Vitruvian man who is based on the correlations of ideal human proportions with geometry described by the ancient Roman architect Vitruvius (Lakoff, G. (1993).

The two referents of the metaphor are the geometrical proportions of the ideal human figure with scale as the commonplace. As the human figure is to the space so is the volume (height, width and depth) of the space. A huge volume would dwarf the figure while a small volume could exaggerate the size of the man. Both classical and contemporary design takes advantage of scale as a design tool and itself the apparent metaphor.

In Ancient Egypt the symbolic pyramids, pottery, and large scale temples gave the Napoleonic period its “Empire” styles and later still the “Biedermeier” furniture style. Metaphorically, the pyramids are a mystery as we can see the referent of the current context; but historians cannot absolutely finalize the other referent of the metaphor. “The founding and ordering of the city and her most important buildings (the palace or temple) were often executed by priests or even the ruler himself and the construction was accompanied by rituals intended to enter human activity into continued divine benediction” (Copplestone, T. (1963).

Contrast this metaphor to contemporary metaphors involving, for examples, Fortune 500 corporate images, a new town or a real estate development, commercial retail chains (i.e.
McDonalds), and public housing or public works projects. The Egyptian example kept tight
tight control on the overt conceptual metaphor and used the building as a state instrument.

Often these are dubbed onto the culture to invest with a name, character, dignity, title, or
style (Kuhn, T. S (1993). Metaphors are often signs and monuments to spiritual beings in an
effort to say ‘as they, so are we’; or “as we, so are they”. In 21st century democracies, or would-
be democracies, such divination reminds people to distrust metaphors and metaphoric thinking,
supposing they allude to un-popular metaphors of religiosity, anarchy and despotism. Wishing
not to recall the oppression under Turkish occupation, the kingdom of Saudi Arabia does not
maintain the buildings built during that time. In a similar respect, present-day Germany and Italy
are often ambivalent about what to do with the architectural vestiges of National Socialism and
Fascism.

As noted earlier, contemporary architecture is more about the unseen and implicit
metaphors where the metaphor is between elements and factors of program, building technology
and social context; it is less about the gestalt and more about its component parts. It is more the
essence of architecture; the making of metaphors than that overview of the apparent historical
metaphor. Yet, today, in synthetic urbanisms, metaphors attract and provide scenarios of
metaphoric lifestyles providing all the mainstay commonplaces. Ancient architecture was
characterized by the tension between the divine and mortal world, even cities, where metaphor
markings contained sacred space over the outside wilderness of nature. The temple or palace
continued this role by acting as a house for the gods.

Of these the most famous was the first city of Babylon (Baghdad) built around 600 B.C.
in Lower Mesopotamia in the Neo-Syrian Empire. In it was one of the Seven Wonders of the
World: the hanging gardens of Babylon and the famous Ziggurat which were the focal and
spiritual centers of the city. It was amongst the first urbanizations where urbanizations occurred between 4000 and 3500 BC (Sundell, G. (1988).

The City of Baghdad was the first city where its citizens surrendered (primary definition of Islam) their rights to a “straight easement” to create straight streets off the walled houses and properties (Hakim, B. (1958). If ever a city had a metaphoric commonplace it was to be found in the “straight street”. Perhaps, this is the first sign of a city when its citizens surrender their rights of space and yield right of ways and easements so that the whole may function (Akbar, J. A. (1988). The oldest civilization we know is the Sumer - located in the far south of present-day Iraq. Around 6,000 years ago, the Sumerians built the world's first city - Uruk – and thus introduced urban civilization to the world.

It is at the confluence of the two great rivers, the Tigris and Euphrates at the site of what was the Fertile Crescent and is now the present-day location of Basra. It was urban because it had infrastructure which included water, sewers, roads and law and order. Metaphorically, the city was a reification of authority and consensus, represented by the widespread use of “seals” which point to a rudimentary form of government (Schmidt, J. (1964).

As metaphors, these seals were the precursor to the crudest form of writing (cuneiform characters formed by the arrangement of small wedge-shaped elements and used in ancient Sumerian, Akkadian, Assyrian, Babylonian, and Persian writing) which were put in place as a form of documentation that served to both witness and prove identity of the good to the recipient; they were obviously marks of responsibility and were the property of individuals and in some cases offices. As its buildings, the city itself was a metaphor with apparently unrelated factors yet having commonalities. These commonalities were represented in monumental buildings, steps, and edifices.
“The Epic of Gilgamesh”, which was written in Samaria, around 4,500 years ago describes how Gilgamesh, a king of Uruk, set out on a quest for knowledge and immortality (one of ancient pillars of metaphors), and how in the end he found them through architecture (Schmidt, J. (1964). The Samarians believed that only by building, could a king honor his gods and obtain immortality. To the Sumerian kings, who stamped their names in the bricks of their buildings so they would forever live in the memory of man; city building - architecture - was divine. In fact, Uruk was an ancient city of Sumer and was later named Babylonia situated east of the present bed of the Euphrates and is present day Baghdad. With trade and the inevitable storage of wealth in mind the Uruk period was to set the standard that we now find in the later third millennium and beyond (Schmidt, J. (1964).

It is thought that the expansion was driven by the necessity for raw materials such as base metals, timber, common stone and oils; as well as exotic goods such as rare metals, semi-precious and precious stones, of which none was to be found in the alluvial plains of the south.

The necessity of these essential goods led the Uruk culture to establish a number of urban communities along the lines of older trade routes attained by either tribute to local rulers, small foraging insurgencies and plundering, or more commonly by reciprocating with labor intensive processed and semi-processed goods. It produced the metaphor of pomp, pageantry and ostentatious wealth. As many later cities built trade crossroads, so the city itself was a metaphor of those commonalities and differences it accommodated (Jeziorski, M. (1993). More often than not designers were influenced by the existence of similar types than to re-invent themselves from scratch. Like a dance they emulated one another.

“The architect, be he priest or king, was not the sole important figure; he was merely part of a continuing tradition” (Hitchcock, H-P. (1958). Indeed, these master builders made the kind
of metaphors that communicated overtly and left no doubt as to their intent or meanings. The Egyptian pyramids were early examples of implicit metaphors where all the metaphors were not for the public but for the gods. They were meant to communicate but not to the general public. Most were built as tombs for the country's pharaohs and their consorts during the Old and Middle Kingdom periods. As such they were built far away from population centers.

On the other hand, the pharaoh’s wealth and the appreciation for receiving more wealth from his subjects and other protectorates were exemplified by open treasurers and lavish decorations exhibiting the wealth (Miller, G. A, (1993). Such is the way public metaphors and monuments are created as an aggregate of a common idea by one culture and society.

In geometry, one form of pyramid is a polyhedron formed by connecting a polygonal base and a point, called the apex. The pyramid is an elegant metaphor where each base edge and apex forms a triangle. It is a conic solid with a polygonal base. The other, a tetrahedron has a three rather than the four side base (Nuttgens, Patrick (1983). The pyramids are claimed to have many "secrets;" that they are models of the earth, that they form part of an enormous star chart, that their shafts are aligned with certain stars, that they are part of pare of a navigational system to help travelers in the desert find their way, and on and on. The mystery of the referent is exaggerated because it is out of our current context and its referent is unknown. The Great Pyramid is said to contain the metaphor of the “Golden Ratio”. Buckminster Fuller extended the geometry of the triangle to form the geodesic dome, which he later explained derives a universal structure seen in the stars (Fuller, R. B. (1975). The metaphor of the pyramid’s technology depended on nature but was conditioned by the mechanics of pulleys, cable and the invention of the wheel.
Architectural metaphors are composed of both conceptual and technical metaphors as art involves a craft. Little known to historians is that much of the Egyptian temple architecture (post and lintel) was derived from the “up-river” Sudan. This exemplifies that although much of our conceptual system is metaphorical; a significant part of it is non-metaphorical.

“Metaphorical understanding is grounded in non-metaphorical understanding” (Lakoff, G. (1993). Our primary experiences grounded in the laws of physics of gravity, plasticity, liquids, winds, sunlight, etc. all contribute to our metaphorical understanding where the conceptual commonality accepts the strange.

“Mesoamerican architecture is the set of architectural traditions produced by pre-Columbian cultures and civilizations of Mesoamerica traditions which are best known in the form of public, ceremonial and urban monumental buildings and structures” (Bannister, F. (1996). Where its cities were formed, prehistoric groups in this area are characterized by agricultural villages and large ceremonial and politico-religious capitals. This cultural area included some of the most complex and advanced cultures of the Americas, including the Olmec, Teotihuacan, the Maya and the Aztec (Carrasco, Pedro (2008).

Mesoamerican architecture is mostly noted for its pyramids which are the largest such structures outside of Ancient Egypt” (Bannister, F. (1996). They are not unlike the Greek or Roman cities formed on a single spine off which are symmetrically placed buildings such as temples, markets, baths, halls and ball courts. Over time and changing periods, like many of the temples in Europe, they were built over each other and when excavated one can uncover layers of periods of older temples buried beneath; most notably in Split, in Croatia, where in one building the layers of time are accessible to the public and can be seen from outside as well as by climbing down to the lowest level.
A German ethnologist, Paul Kirchhoff, defined the Mesoamerican zone as a culture area based on a suite of interrelated cultural similarities brought about by millennia of inter- and intra-regional interaction (Kirchhoff, P. (1963). These included sedentarism, agriculture (specifically a reliance on the cultivation of maize), the use of two different calendars (a 260 day ritual calendar and a 365 day calendar based on the solar year), a base 20 (vigesimal) number system, pictographic and hieroglyphic writing systems, the practice of various forms of sacrifice, and a complex of shared ideological concepts; intriguing way that this Greek for middle became the metaphor for the combined culture and its unique commonplace (Carrasco, P. (2008).

The Saudi Arabians use the Hydra calendar, which subdivides 12 months into 30 day intervals and is annually adjusted by the appearance of the moon. What is most striking throughout Saudi Arabia is the way city grids are oriented toward Mecca. And if they were not the qiblah and its minbar of the mosque is built off the grid of its context to face the Kaaba in Mecca. There are many other details of Saudi Arabian architecture which provides insights into the way many of the ancient metaphors were designed.

For western culture the period of ancient Greece resonates till today. Both the Greeks and the Roman metaphors were based on their orders of architecture including their metaphoric columns, entablatures, statues and sculptures (Bannister, F. (1996). Each of these referred to something else; the column was the tree and capitals defined one from the other order (Doric, Ionic, and Corinthian), and the entablatures contained depictions of their deities and heroes. The architecture and urbanism of the Greeks and Romans were very different from those of the Egyptians or Persians in that civic life gained importance. During the time of the ancients, religious matters were the domain of the ruling order alone; by the time of the Greeks, religious mystery had skipped the confines of the temple-palace compounds and was the subject of the
people or “polis”. The conceptual metaphor embodied Greek civic life sustained by new, open spaces called the “agora” which were surrounded by public buildings, stores and temples. The “agora” embodied the new found respect for social justice received through open debate rather than imperial mandate. “Though divine wisdom still presided over human affairs, the living rituals of ancient civilizations had become inscribed in space, in the paths that wound towards the acropolis for example. Each place had its own nature, set within a world refracted through myth, thus temples were sited atop mountains all the better to touch the heavens” (Bannister, F. (1996).

The Greeks metaphorically transformed the Egyptian post and lintel from wood to stone. The same technology that had earlier been invented by the Egyptians was now adapted and used for stone and statues which became columns and gable ends (entablatures), and which were decorated with the carved relief of the people’s government.

These were “analogical transfers”, where instructive metaphors created an analogy between a to-be-learned- system (target domain) and a familiar systems (metaphoric domain) (Mayer, R. E, (1993). Later, not unlike classical Gothic, modern architecture likened to express the truth about the building systems, materials, open lifestyles, use of light and air and bringing nature into the buildings environment. Modern architecture went a step further, ridding buildings of the irrelevant and time worn clichés of building design decoration, and traditional principles of classical architecture as, for example, professed by the Beaux Artes movement.

In modern and Eastern architecture the equipoise achieved by the axiom of “unity, symmetry and balance” was replaced by “asymmetrical tensional relationships” between “dominant, subdominant and tertiary” forms, and the influence of science and engineering on
architectural design gave rise to new design metaphors. The Bauhaus found the metaphor in all
the arts, the commonalties in designing architecture, jewelry, furniture and clothes.

One way to look at the metaphoric unity of Roman architecture is through a new-found
realization of theory derived from practice and embodied spatially. Civically this is found
happening in the Roman forum (sibling of the Greek agora), where public participation is
increasingly removed from the concrete performance of rituals and represented in the decor of
the architecture. Thus we finally see the beginnings of the contemporary public square in the
Forum Iulium, begun by Julius Caesar, where the buildings present themselves through their
facades as representations within the space.

As the Romans chose representations (metaphors) of sanctity over actual sacred spaces to
participate in society, so the communicative nature of space was opened to human manipulation.
None of which would have been possible without the advances of Roman engineering and
construction or the newly found marble quarries which were the spoils of war; inventions like the
arch and concrete gave a whole new form to Roman architecture, fluidly enclosing space in taut
domes and colonnades, clothing the grounds for imperial rule and civic order. An unintended
consequence was a model for social concerns and accommodations (public baths, toilets,
markets, parks, recreation areas, crafts, etc.).

The Romans widely employed, and further developed the arch, vault and dome. Their
innovative use of concrete facilitated the construction of the many public buildings of often
unprecedented size throughout the empire. These include temples, baths, bridges, aqueducts,
harbors, triumphal arches, amphitheatres, circuses, palaces, mausolea and in the late empire, also
churches (Bannister, F. (1996).
Through the metaphors of law and order, civic pride led to architectural simplifications of the structure keeping the treasure hidden but exemplifying the metaphor of the government in its “order” of architecture as metaphor for the government’s civic order. As the government did, so the architecture exuded technical and conceptual metaphorical forms of unity, symmetry and balance. As the Egyptians did, so the Greeks and the Romans built monuments as sign-metaphors to publicly express consensus toward gods, persons and events. Temples were built to house the gods such as Venus and Apollo as well as the courts of justice and senate (Bannister, F. (1996). The architecture metaphors were the representation residue of the consensus and righteousness of society.

Elsewhere, “India’s urban civilization is traceable to Mohenjodaro and Harappa, now in Pakistan. Over a period of time, ancient Indian art of construction blended with Greek styles and spread to Central Asia. India’s metaphors are their distinctive design of temples and colorful Hindu art which incorporated statues, appliqués, pilasters and columns of the many aspects of their deities including Rama, Saraswati, Hanuman, Ganesha, Devi, and many others (Copplestone, T. (1963). They were both metaphor of their contextual consensus while being analogies of their foreign political, social and commercial alliances.

In Chinese architecture pagodas, Buddha and the Great Wall are the three distinctive metaphors of China. One example is the use of yellow roof tiles; yellow having been the imperial color, yellow roof tiles still adorn most of the buildings within the Forbidden City. The Temple of Heaven, however, uses blue roof tiles to symbolize the sky. The roofs are almost invariably supported by brackets, a feature shared only with the largest of religious buildings. The wooden columns of the buildings, as well as the surface of the walls, tend to be red in color” (Ching, F.
(2006). In the age of science, colors are used to induce certain emotional conditions and achieve effective spatial designs. However, out of context, their ancient metaphoric significance is often forgotten.

The ancient Japanese architecture is best exemplified by the metaphoric Japanese tea house, where bamboo and paper walls remain Japan’s metaphoric cultural legacy. “Two new forms of architecture were developed in medieval Japan in response to the militaristic climate of the times: the castle, a defensive structure built to house a feudal lord and his soldiers in times of trouble; and the shoin, a reception hall and private study area designed to reflect the relationships of lord and vassal within a feudal society” (Ching, F. (2006). Most notably is the Japanese tea house which is “place” but not “function” oriented. Any function can occur in any area and areas may or may not be separated by sliding paper partitions. Operations and circulation metaphor is to the context of the designed landscape which is the architect’s version of a kind of paradise. Western architecture’s sighting of castles, estates and private residences learns from this metaphor relating family occupants to context concerned with topography, surrounds, winds, sun-rise and sunset and other bio-climatic factors. In the background was origami (the art of folding paper) which has recently been adapted by mathematicians to design buildings, sculptures, and furniture made part of the (conditions, operations, ideals and goals) program. Such systems potentially can result in such buildings as recently designed for the Emirates (Dubai, Doha, and Abu Dhabi), Shanghai, and Hong Kong.

Islamic architecture: Bedouins are nomadic and tent design and layouts are concerned with the environment of the desert and arrayed with the tribal metaphors emblems, colors, banners and carpets (Fez-Barringten, B.(1993). “Each color and combination of colors is distinctive to the family and “turf” of the tribe. Some distinctive structures in Islamic architecture
are mosques, tombs, palaces and forts, although Islamic architects have, of course, also applied their distinctive design precepts to domestic architecture.” Like the retail mall of today the Arabian souks each has metaphors of their culture, craft and artistic technology. The architecture of the Arabian souk emulates the Bedouin tents and makeshift gathering of traders. Arab homes are surrounded by walls and windows clad with mashrabia for privacy particularly for the family and its women. There is a separate area of the home for the family and the visitor with separate entrances.

Most so-called Arab architecture is exemplified by asymmetrical placements of window opening and decoration. The metaphor of ambulatories and public passages is a history of surrender and intervention between neighbors and tribes as they collected in cities like Babylon. In the 1960s, Frei Otto designed the stadiums for Munich Olympics using canvas and cables on a mammoth scale based on the tent cable system developed by the Arabs. Much of this asymmetry is recalled in both European and Turkish fortresses.

Africa’s architectural technical legacy is its post and lintel construction where horizontal, diagonal and vertical elements are attached at their intersecting joints with hemp forming the outlines of what was later transferred down the Nile (the northern section of the river flows almost entirely through desert, from Sudan into Egypt) to Egypt to be the technological metaphor for Egyptian palaces. These were transferred by the Sudanese to Egypt along with abundant labor, wood and colorful pigment to decorate the buildings. These tied joints were later reflected in the capitals and brackets of Greek architecture.

Medieval architecture was dominated by palaces and castles surrounded by walls where the court lived within and the serfs lived outside. The serfs’ houses were mud, thatch and timber copies of the castles technology as poor subordinate human relations to those inside the wall.
This metaphor was inherited from earliest Egypt and lasted till their French Revolution (even to big New World cities like New Amsterdam). The metaphoric-castle vocabulary of the times designed the great halls, plates to eat off (since they were made of metal or “plate”), and furniture which were not movable.

It is the Renaissance where Europeans finally developed movables (moebles). The medieval world had few movables aside from trunks which housed their belongings as they had to be ready when raided to escape in an instant. So they sat on the cases and soon these evolved into furniture with legs and arms, etc. All of these had metaphoric decorations of animals and natural pallets and trees.

In France during the so-called Gothic period, technologically the fly buttress and use of the point rather than the vaulted arch revolutionize large spans and building design. When considering building rather than tents the Indian, Persian and Arabians also adopted this analogous pointed arch motif. For politico-religious reasons (i.e. the Crusades) like the prohibition against the sign of the cross, the Roman vaulted domes were also banned. The cathedral in Chartres and Notre Dame in Paris exemplified this technology. Most famous was the “flying buttress” used to transmit the horizontal force of a vaulted ceiling through the walls and across an intervening space to a counterweight outside the building. As a result, the buttress seemingly flies through the air, and hence is known as a "flying" buttress. Thus the pointed arch (the thrust of the supports crossed each other at the apex) and the long spans within gave Gothic architecture its distinctive metaphoric image.

Renaissance architecture was all based on the rediscovery of Roman ruins and the revival of ancient literature which brought both an intellectual, political and artistic rebirth to all of Europe. Starting in Florence and other Italian city states, it later spread via France to the whole
of Europe. Perspective drawing and other artistic devices flourished including building, furniture and household decorative items.

Metaphorical new representations of the horizon, evidenced in the expanses of space opened up in Renaissance painting, helped shape new humanist thought (Nuttgens, Patrick 1983) and the way buildings were conceived and designed.

Baroque architecture was characterized by free and sculptural use of the classical orders and ornament, by forms in elevation and plan suggesting movement, and by dramatic effect in which architecture, painting, sculpture, and the decorative arts often worked to combined effect (bursting, dynamic, forward) which all announced a rebirth of human culture and artist-made three-dimensional sculptural paintings. The key to understanding its arts and architecture was that it was a metaphor of coming to life and motion. It was all extravagantly ornate, florid, and convoluted in character and style. Forms burst through their stayed forms purposefully depicting freedom, joy and vibrancy (as broken pediments and Bernini’s sculptures attest). The metaphor was from the parts to the whole and from the whole to the parts (Zarefsky, D 2005). When kingdoms created dynasty’s iconic buildings, the architect and artisans took their cues from the reigning monarch. They converted these verbal instructions into habitable iconic cognitions, places to store and represent their wealth and places to defend their domains. The referents were clearly monetarily valued as in “more is better” with security and privacy. With the introduction of civil codes, architecture was now also concerned about the health, safety and welfare of the general public. In certain modern pluralistic societies the free reign of ideas and opinions as to contexts and their meanings are diverse (Rumelhart, D. E 1991). Works of architecture’s whole and the parts had congruence where they shared the same architectural vocabulary with respect to their building systems, materials and design philosophy.
Queen Maria Theresa of Austria grasped both the implicit and explicit metaphor and commissioned her palace to communicate its concern for the human scale and employed hundreds of artisans to craft furniture, games, and decorations designed to be metaphors of the color, shapes and forms of nature and technology. Furthermore, and enamored with the finding of ruins in Italy she had them transported and some rebuilt on Schönbrunn to connect her time with the classical past. In fact Emperor Leopold hired Johann Bernard Fischer von Erlach to produce a design in 1688. Maria Theresa could only be regarded as an informed client (probably an opinionated one) and she got the “architect of the court” Nicolo Pacassi to redesign the palace and the gardens. Schönbrunn is an orchestration of metaphoric factors gathered by a variety of apparently unrelated crafts and craftsman around them and subjects of the court’s choosing. By so doing, these crafts were emulated by the court and citizens exemplifying how human cognition is fundamentally shaped by various processes of figuration (Gibbs, Jr., R. W (1993). This habitable metaphor was not meant for the user to fully, continuously and forever recall all that went into its’ production. The palace and its grounds was one metaphor after the other including the ruins, gardens and statues. Throughout the empire, in an attempt to make the strange familiar (showing her gratitude to the Hungarians), matching, copying and emulating the design of other buildings and adapting the design of one to Schönbrunn adapted to the more familiar building in Vienna and the surrounding villages.

Following in her mother’s love of design Marie Antoinette so disgusted with her exile from Paris revived a metaphorical (picturesque) Petit Trianon; Marie Antoinette’s version of the Petit Trianon is where she insisted on living as she wished.

This arrangement shows the eclecticism and refinement of Marie-Antoinette, an art of living linked to free thinking, for the spirit of the Enlightenment was far from absent here. Much
earlier the roofoescape of Chambord contrasts with the masses of its masonry and has often been
compared with the skyline of a town: it shows eleven kinds of towers and three types of
chimneys, without symmetry, framed at the corners by the massive towers. The design parallels
are north Italian and Leonardoesque. The town on the roof of this palace was fully equipped with
reduced size shops and boutiques where one could imagine the queen and her court could amble
as though they were in the city. Unlike the Arabian souks, the Parisien and French shops
developed an architecture overtly expressing the shop’s contents to market their wares.

It was no accident that when US cities began designing and building they copied the
European models of retail and commercial shops. Even the metaphors of extending roof heights
with false work to be taller than their neighbors were adapted and still today is practiced in the
international style of building design. The Duomo in Milan is an important example of city-wide
and public metaphor where many artisans were employed to carve the many statues and
gargoyles on its facades. Each carving was a metaphor and the collection of them all
communicated the unity of passion and adherence to the church. This exemplified the interaction
view of metaphor where metaphors work by applying to the principle (literal) subject of the
metaphor to a system of “associated implications” characteristic of the metaphorical secondary
subject. These implications were typically provided by the received “commonplaces” (general
beliefs or values that are widely shared within a culture) about the secondary subject: “In this
case the success of the metaphor rests on its success in conveying to the reader some quieter
defined respects of similarity or analogy between the principle and secondary subject.”

Milan’s Duomo is only one of hundreds of examples of this unified and diverse building
metaphor (Boyd, R (1993)).
Remarkably, the architectural beneficiary of free enterprise, democracy and the sovereignty of the individual was the modern architecture which was metaphorically demarked by the so-called Art Nouveau style. Art Nouveau (or Jugendstil – youth art) which began in Paris and Munich was exemplified by its metaphorical signs of leaves, vines and nature reminiscent of the tree-like forms of the Gothic buttresses and arches. Art Nouveau encompasses a hierarchy of scales in design architecture; interior design; decorative arts including jewelry, furniture, textiles, household silver and other utensils, lighting and the full range of visual arts. In some ways it was a precursor to the Bauhaus where modern architecture really got its start, which eclipsed the Beaux Artes’ eclecticism. The metaphors of contemporary and modern architecture were their abstract, cubistic and plain design (lack of embellishments). They strove to be impersonal, general and metaphorically dead. Not to belabor the socio-political, design went on a competitive rampage between citizens, but within the vernacular of the available materials, technology and design theory. Bauhaus was also committed to achieve high quality design with machine-made mass production. Modern architecture theory was applied to both public and private enterprises producing public works and privately owned public buildings. The use of structural iron and steel and steel reinforced concreted changed the look, size and scale of building-types, especially the office building which now, owing to the elevator, could convey people to great heights to figuratively scrape the sky. Stadia, transportation terminal and manufacturing buildings could be covered with long span steel beams, cables and folded plates (some derived from origami). This exercised the “analogical transfer theory” where instructive metaphors create an analogy between a-to-be-learned- system (target domain) and a familiar system. *Mayer, R. E (1993)* Technically, not unlike classical Gothic, modern architecture wanted to express the truth about the building’s systems, materials, open lifestyles, use of light and air and bringing nature into the
building’s environment, not to mention ridding building of the irrelevant and time-worn clichés of building design decoration, and traditional principles of classical architecture as professed by the Beaux Artes movement. For equipoise “unity, symmetry and balance” were replaced by “asymmetrical tensional relationships” between, “dominant, subdominant and tertiary” forms; and, the results of science and engineering influence on architectural design birthed a new design metaphor. The Bauhaus found the metaphor in all the arts, the commonalties in making jewelry, furniture, architecture, interior design, decoration, lighting, and industrial design: even fine art, music and poetry. They believed that there were principles of design that transferred from one to the other techne.

“Functionalism”, including “modern architecture” was a term given to a number of building styles with similar characteristics; primarily the simplification of form and the elimination of ornament that first arose around 1900. By the 1940s and for several decades in the 20th century these styles had been consolidated and identified as the “International Style” and became the dominant architectural style, particularly for institutional and corporate buildings. The exact characteristics and origins of modern architecture are still open to interpretation and debate.

However, it was certainly affected by the instrumentalisation/industrialization of architecture as argued under the maxim "form follows function" (Banham, R. (1980). A disappointment to the purist was that the mainstays of ancient metaphors were still alive and well including the commonplaces of turf, identity, security, status, power, protection and shelter. In fact with the unleashing of the global real estate boom, real estate investment trusts, and free enterprise that the inordinate variety of metaphoric iconic building types dwarfed anything of the past in such historically low-key places as Dubai, Doha, Shanghai, Hong Kong, Jakarta, Manila,
Tokyo, Las Vegas, Sydney, Hamburg, Singapore, and Hawaii; not to mention the historically notorious places as New York, Chicago, San Francisco, Paris, Berlin, etc.

Futurist architecture was a metaphoric term alluding to the past compared with a later period (Watkin, D. (2005). While it claimed to sever such ties and present something new, in fact it talked about the future in terms of its present. It was a metaphor which tried to make the strange (future) familiar by talking about one time in terms of the other (Gordon, W. J. J. (1971).

“Futurist architecture began as an early-20th century form of architecture characterized by anti-historicism (where historicism is a theory that history is determined by immutable laws and not by human agency) and long horizontal lines suggesting speed, motion and urgency. Technology and even violence were among the themes of the Futurists”. The epic film, “The Shape of Things to Come”, based on the novel by H G Wells, was one of its important achievements. All of this was eclipsed by contemporary science fiction movie making technologies and concepts using artificial intelligence, time travel, supernatural and spiritual manifestations.

Expressionist architecture style was characterized by an early-modernist adoption of novel materials, formal innovation, and very unusual massing; sometimes inspired by natural biomorphic forms or sometimes by the new technical possibilities offered by the mass production of brick, steel and especially glass. Morris Lapidus’ Fountainbleu and Eden Roc Hotels are other such fine examples (Curtis, W. J. R. (1987).

Postmodern architecture was an international style whose first examples were generally cited as being from the 1950s, and which continued to influence present-day architecture. (Jencks, C. (1993) Post modernity in architecture is generally thought to be heralded by the return of "wit, ornament and reference" to architecture in response to the formalism of the International Style of
modernism. As with many cultural movements, some of post-modernism's most pronounced and visible ideas can be seen in architecture (Pevsner, N. (1991). Metaphorically combining both technical and conceptual metaphors the art of building with mass produced machine technology; where the parts, fasteners and attachments are all cataloged and internationally available. Even the parts and main structural components are pre-engineered and manufactured off-site. The metaphors of the period are combinations of mini-metaphors made into mega-metaphors; and, made relevant by social, political and cultural metaphors manifest in programs and on-site charattes (any collaborative session in which a group of designers drafts a solution to a design problem). Programs include the wishes, needs and necessities of owners, users, and public authorities. The functional and formalized shapes and spaces of the modernist movement were replaced by unapologetic contrary aesthetics (as deconstructivism’s stimulating unpredictability and controlled chaos). Serendipitously, styles collided, forms were adopted (for their own sake), and new ways of viewing familiar styles and spaces abounded. Classic examples of modern architecture commercial space are the Lever House (SOM - Skidmore, Owens and Merrill) and the Seagram Building (Phillip Johnson), and the architecture of Frank Lloyd Wright or the Bauhaus movement in private or communal spaces. Not to mention Libeskind's Imperial War Museum North in Manchester, DP World, Dubai’s City Center, Riyadh’s Kingdom Tower, King Abdullah Economic City in Jeddah, MGM Mirage, Palm Jumeirah, Milwaukee Art Museum., Bilbao Guggenheim, Beijing's Olympic Stadium (metaphoric bird’s nest), MIT's State Center in Cambridge, Mass, The Royal Ontario Museum extension in Toronto, Melbourne Recital Centre and Melbourne Theatre Company building, and the anti-iconic State Center at MIT by Gehry & Partners.
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