The recovery of dialogue

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The cultural richness that once made Leonardo's *Paragone* possible quickly waned in the wake of the 18th century separation of natural science and fine art into competing systems of knowledge, leaving architects to contend with 'gaps' and fragments of unity. Arguably these gaps are the cause of much uncertainty in a discipline that, weakened through autonomy is enriched by engagement and multidisciplinary praxis. If traditional architectural treatises that once took art and science to be intertwined skills held together by a higher order of design intelligence are difficult to conceive in our present culture, what valid mode of discourse remains to assist architects think through the future continuity of art and science? This paper does not support the view that systematic methods are easily transposed onto architecture in order to reduce its unpredictable phenomena to stable predictable facts. Contemporary thought is sufficiently mature to realise that the generalisation of specialist knowledge, instrumentality and expertise always leaves something out. The ongoing challenge to architecture today is therefore how to re-articulate the relational space between art and science in a way that enhances their symbiosis within design. Symbolism, metaphor, analogy and geometrical abstraction once supplied architecture and creative discourse with intermediate links and devices, but what other tactics are available to the architect today? The primary objective of the paper is to recover traditional *dialogue* as a legitimate and meaningful mode in this regard. Secondly, the paper critically differentiates dialogue from its more contemporary version, *collaboration*, with which it is often confused. The question at stake is whether the now ubiquitous notion of collaborative practice can actually fulfil the purposes of mediation and enrichment associated with dialogical intelligence, or is it yet another functional adjunct for streamlining technique and labour?
Key words: dialogue, collaboration, creativity, integration, element, part

La recuperación del diálogo
La riqueza cultural que en otra época hizo posible el *Paragone* de Leonardo declinó rápidamente a partir del siglo XVIII, como resultado de la separación de las ciencias naturales y las bellas artes en dos sistemas rivales de conocimiento, enfrentando a los arquitectos a *lagunas* y fragmentos de unidad. Podría decirse que estas lagunas son la causa de mucha incertidumbre en una disciplina que se debilita con la autonomía pero se enriquece con la participación y la práctica multidisciplinaria. Ya que los tratados tradicionales de arquitectura, que solían considerar al arte y la ciencia como disciplinas entrelazadas y unidas por un orden supremo de inteligencia diseñadora, son difíciles de concebir en nuestra cultura actual, ¿qué modo de discurso válido permanece para ayudar a los arquitectos a pensar detenidamente sobre la continuidad futura del arte y de la ciencia? Este ensayo no sustenta la opinión de que los métodos sistemáticos se puedan trasponer fácilmente a la arquitectura con la finalidad de reducir sus fenómenos impredecibles a hechos estables y predecibles. El pensamiento contemporáneo es suficientemente maduro para comprender que la generalización del conocimiento especializado, la instrumentalidad y la pericia siempre excluye algo. Por lo tanto, el reto permanente para la arquitectura hoy es cómo articular de nuevo el espacio relacional entre el arte y la ciencia de una manera que incremente su simbiosis dentro del diseño. El simbolismo, la metáfora, la analogía y la abstracción geométrica suministraron en el pasado conexiones y recursos intermedios a la arquitectura y al discurso creativo, pero ¿de qué otras tácticas dispone el arquitecto actual? El objetivo principal de este ensayo es recuperar el *diálogo* tradicional como modo legítimo y significativo en este aspecto. En segundo lugar, el ensayo distingue críticamente entre el diálogo y su versión más contemporánea, la *colaboración*, con la cual se confunde frecuentemente. La pregunta decisiva es si el concepto ahora tan ubicuo de práctica colaborativa puede satisfacer el propósito de mediación y enriquecimiento asociado con la inteligencia dialógica, o si se trata de otro apéndice funcional más para racionalizar la técnica y el trabajo.
Palabras clave: diálogo, colaboración, creatividad, integración, elemento, parte

Internal disciplinary friction has been a constant feature of architectural design intelligence at least since Callicrates attempted to craft together within a syncretic figure latent motifs drawn from various cultural and cosmological horizons.[1] All smoothly composed, idealised figures will have passed through a difficult intermediate stage or 'middle ground'. Arguably it is this intermediate stage which is the making of a project, for here is where the awkward syncretism of non-coherent elements, processes and techniques is transformed into a composed, elegant state. This 'middle ground', consisting of semi-formed materials half-related to ideas, is the vital potential state and *prima materia* that we implicitly refer to in dialogue. If dialogue has played an overarching philosophical role in a subject challenged by the need to intertwine cultural strands, layers of knowledge and a range of skill, does it still have a future?

Perhaps the most perplexing aspect of dialogue is its meandering and ambiguous nature. This oscillatory movement is often perceived as being irreducible to method. As a consequence it quickly becomes a problem to be 'straightened out' by the application of rationality and streamlined technique, or more recently, the closer collaboration of specialists drawn from art and science. Gaining control over the intermediate meanderings of the design process has thus been a long standing dream of systematic thought, which by distancing itself from creative involvement with subject matter, imposes a governing methodology to sort out "mess" (Law 2004). Getting beyond this impasse can be a tricky business, but as Snodgrass and Coyne point out, the key difference lies within the fact that in "method the inquirer controls and manipulates" whereas in dialogue, a "process is entered into so that the subject matter can reveal itself" (Snodgrass and Coyne 2006: 42). The immediate challenge faced by those still interested in the relationship between art and science is how to attune ourselves to their intersecting materials, i.e. the middle ground (*intermundia*).

The structure of dialogue

One perspective from which to view the ongoing *rapprochement* of art and science is as a dialogical encounter in which the scale and limits of each operation are mutually disclosed. According to Pallasmaa (2005: 9), "encounters" become unavoidable once it is recognised that "any artistic discipline consists of both instrumental and existential realms" for dialogue amounts to much more than juxtaposing degrees of expertise within a shared space. The deeper question we need to address is what exactly happens to instrumental and existential realms during their charged, middle ground encounter?

In its primary form dialogue refers to oral culture, i.e. face-to-face conversational practices between architects, clients, users, policy makers, contractors and specialist consultants. This is clear in the following exchange between the architect Peter Clegg (Feilden Clegg Bradley) and environmental scientist Max Fordham (Max Fordham Associates), where they discuss the initial design stages of the National Trust Headquarters (Swindon, UK):

> Listening to Peter reminded me of the difference between being an engineer and being an architect. When you are an engineer you can have a very narrow vision which most engineers do, and in a way that narrowness of vision gives you the freedom to have really crazy ideas. When you look at how the plan developed with Peter doing the architecture you can see that there is a lot more to it than my simplistic little lighting idea. And that is very important. The people who benefit from the architecture benefit from a whole lot of values and emotions that have to be satisfied in the building. So it is no good just having a simple view.[2]

Two important insights emerge from this behind the scenes look into what happens when architects and scientists engage in dialogue. Firstly, in conceding the highly specific nature of his role, Fordham is suggesting that in the end science is primarily housed by architecture rather than vice versa. At the same time, Clegg's responsibility as a designer is to construe an enlarged existential framework from where the data supplied by Fordham and other specialists can be culturally interpreted. What this indicates is that dialogue activates the project space, which then distends under the pressure of a *double movement*; a back and forth motion between horizontally connected skills, labour and knowledge (enrichment and interplay), intersected by vertical transformations of material facts into meaningful phenomena.

The intertwining of horizontal and vertical dimensions reveals the twofold character of dialogue. Firstly, it establishes a clearing in the midst of other discourses in order to facilitate the multi-disciplinary exchanges required by architecture. On a horizontal level dialogue sets up the vital "continuity of reference" that provides the condition of possibility for conversation

(Vesely 2004). It also highlights the importance of creative conflict within the design process. Forcing the project to incorporate elements that cause tension and transformation is, according to Alvaro Siza, a driving force in contemporary design: "In the society we live in design without dialogue, without conflict and encounter, without doubt and conviction…is unthinkable" (Siza 1997: 29). Secondly, the work reaches out beyond itself into an extended field of reference similar to way an aphorism breaks open a closed or finite horizon.

Philosophically speaking dialogue can be understood as a form of ontological movement, or transformative situation involving the use of poetic judgement to blend science with craft in the production of *techne*. In brief terms, resituating instrumental technologies in relation to artistic praxis constitutes the horizontal, productive dimension of dialogue, whilst a vertical, intelligible axis links those same material skills to culture and history in the form of a meta-dialogue. The first sets up the connective tissue of the project space, whereas the second differentiates that same space into a spectrum of physical and intellectual layers. Architects were only credited with the ability to form practical and theoretical judgements on the basis of their ability to leap between these two axes simultaneously. Had we been living in the *quattrocento* one might have referred to this coupling as a drama involving inspired, interworldly shifts between cosmic layers, but as we are not its secular version is somewhat more straightforward: amplifying the contextual meaning of things. There is a further critical dimension to this double movement: by reconciling split conditions and purified disciplines dialogue cultivates a multi-dimensional type of experience with the capacity to deal with tensions both within and beyond immediate practicality.

The pre-modern background to dialogue is not without relevance to us late-moderns. Etymologically speaking the term identifies the act of 'spanning across or between'. The prefix *dia* points to the virtual movement of crossing ontological, spatial or disciplinary gaps through mediation and translation, whilst the related term *di* ('again' or 'twice') adds an essential temporal dimension, i.e. that the forwards and backwards, upwards and downward movement described above is iterative and recursive. The first book of Vitruvius' *On Architecture* for instance opens with the statement "the architect's professional knowledge is enriched by contributions from many disciplines and different fields of knowledge" (Vitruvius 2009: Ii1). This is a familiar message: only through the combination of art, science, manual apprenticeship, together with a grasp of proportion, can the architect ascend the scale of embodied and theoretical knowledge to arrive at the "highest sanctuary of architecture" (*summum templum architectura*). (Vitruvius 2009: Ii11) An intermediate step in this ascent is "disposition" (arrangement), which according to Vitruvius derives from the Greek *diathesis*, a placement strategy designed to intrinsically order the manifold elements generated by various arts, crafts and sciences. The setting-down of diverse elements according to a well-disposed arrangement of parts that reflects intellectual form became known during the Renaissance as visual knowledge or *disegno* (Quek 2007). If dialogue speaks across subject fields (*dia-legein*) in order to amplify meaning, and disposition (*diathesis*) accounts for the placement of physical elemental relationships, then the *dialogical* space of architectural design once again appears to point towards the intersection of horizontal and vertical orientations.

The vertical and horizontal sequences at work in dialogical experience derive from philosophic devices and strategies used in Platonic and Humanist philosophy. (Scott 2007) According to the semi-mythical account of cosmic beginnings outlined in the *Timaeus*, intelligibility permeates the sensible realm by condensing and gaining traction along a path channelled through increasingly material interlocking regions. This accounts for the hierarchical distinction between geometric 'part' and material 'element' found in the Platonic dialogues. Vertically stratified being is said to initially unfold mathematically, eventually turning into a

horizontal process of material proliferation. Geometric 'parts' were widely regarded as *moirai*, or members whose identity is determined by an elevated order of intelligible beauty, whilst 'elements' - *stoicheia* – occupied a fluctuating planar reality. The terminology also finds its way into architectural typology – the ancient stoa, which occupied one edge of the Athenian agora, being a horizontal space open to the elements. Poised between two layers of existence – the ideal and the real –living material elements were understood to be simultaneously engaged in two directions: open to corporeal mixture yet also susceptible to geometric abstraction (elevation).

Using transformations of material state to express vertical leaps in being is the architectural analogy of the part-element relationship. It was an analogy that Alberti exploited to good effect particularly when describing design as the movement between dispersed elemental bodies and a sympathetic order of parts. The Latin root 'alo', meaning to nourish, support, and physically sustain a healthy body (seasons, weather etc.), is the first layer of material continuity consisting of the four interactive elements making up the auspicious context assessed by the founders of towns (solar orientation, prevailing wind). Overlaid on to this *materia locale* are a further four elementary components (area or base, wall, roof and opening) representing the primordial physical dimensions. Only when proportional measure is brought into play does Alberti go from describing the stratified materiality of context in elementary terms, to referring to them as sympathetic parts. This suggests that what is made through authentic dialogue is achieved by drawing together, beneath a common orbit, an *intermundia* ('interworld').

Despite initial concerns that dialogue might amount to nothing more than a meandering anti-method, it is clear that it does embody a precise structure, albeit one that cannot be strictly classified as method. Not only is it inscribed with vertical and horizontal relationships specific to place and context, it also allows the project space to be re-imagined as a clearing or potentiality that, when activated, takes on an individual configuration. Dialogue also provides a basis for practical judgement and situated knowledge drawn from the direct mediation of different types of subject matter. Tolerant of difference and conflict, it is a mode that refrains from homogenising layers of knowledge either through reduction to basic data type, or common technique. Rather, it permits questions of meaning to gestate alongside matters of scientific concern, resulting in well-rounded architecture knowledge. The question that therefore remains is this: in spite of these positive characteristics why has dialogue suddenly been replaced by collaboration?

The collaborative shift

Since the mid-1990s collaboration has become a primary objective in architecture, but what often goes unacknowledged is that dialogue and collaboration are fundamentally different modes of encounter. The double movement characterising dialogue can be contrasted with collaboration, which joins the Latin prefix *co-* ('together', 'mutual') with labour, resulting in something like direct action or 'smooth production'. The collaborative project space is typically configured as a *rhizosphere*, or flattened field of communication that saturates the middle ground with infrastructure, interdisciplinary processes, integrative tools and increasingly refined media. The goal of collaboration is no longer the creation of an inflected figure that reconciles conflicting values of art and science, but *connectivity*, ie. the infinite differentiation and reintegration of epistemological, ontological and material gaps in order to facilitate the seamless transmission of data and action.

In place of the creative gaps running through *multi*disciplinary dialogue, collaboration re-structures the middle ground as a continuous network of unbroken decisions. The first is based on the differentiated movement of translation and analogy; the second pursues maximum integration. The scale of our current reliance on collaboration can be gauged by the following

statement from Stephen Kieran and James Timberlake's *Prefabricating Architecture*: "An entire new industry that produces communication/collaboration software has made it possible for the various parties in a project to have real time sharing of information" (Kieran and Timberlake 2004: 14). In this instance "prefabrication" amounts to the re-articulation of a previously stratified order of making along the lines of an organically refined process, thus further narrowing the gap between specialist technologies and design intelligence. Sheil (2005: 7) extends this convergent impulse to cover emerging developments in digital manufacturing:

> [We have] entered an era where expertise in making is becoming repositioned at the centre of architectural practice. For architects, the new era is most clearly defined by the revolutionary change in making information. It is led by a convergence in the properties of digital drawing and the automated techniques of manufacturing.

One objection to this tendency is that it could be seen to represent an advanced stage of instrumental determinism, particularly if a general account of its wider contribution to design culture is not apparent. Restoring the architect to a central position within the design process and renewing the overlap between intelligible and material experience is the standard justification in such matters. A broader consensus is that it loosens the ossified social relations of production between manual and intellectual labour, however this fails to fully explain the implication of heightened integration of eye, hand and mind in the present global condition. One possible answer is that collaboration seeks to side step the difficult and uncertain procedures of dialogue by minimising subjective interference. If vertical translation or the pursuit of meaning is considered wasteful, then smooth production reduces artefacts to unmediated (literalised) diagrams of instrumental parameters.

One should also be aware of underlying cultural prejudices claiming that society is no longer "stratified" as layers in need of mediation, but flattened into a "smooth" field of data flows and direct action. Overcoming distance, bridging ontological gaps along with the fusion of drawing with manufacturing can all be viewed as interrelated manifestations of an ideological indifference towards 'middle ground' tactics described above. It is this type of neo-pragmatic performance which encourages architects to forget meaning and concentrate instead on the effect it has or process that shaped it. According to the critic Stan Allen, "practices imply a shift to performance, paying attention to consequences and effects. Not what a building, a text or a drawing means, but what it can do: how it operates in – and on – the world. (Allen & Agrest 2000: xxv). The conditions which made possible the emergence this collaborative performance have their roots in the 19th century, and although a fuller account of that historical situation is beyond the scope of this paper, five impulses can be succinctly identified which together reveal what is at stake in the slow decline of dialogue.

A genealogy of collaboration

The transmission of action

In 1921 the architecturally-trained Swiss theatre designer Adolphe Appia published his major theoretical work, *The Work of Living Art*, which contained the short essay "Collaboration". Continuing in the 19th century Wagnerian *Gesamtkunstwerk* tradition Appia set out the theoretical foundations for an organic approach to theatre design based on the integration of its primary substances (time, space, materiality, body, voice and sound). As we shall see, collaboration and integration often go hand in hand, for at the turn of the 20th Century the search for unity in the arts had shifted beyond the framed juxtaposition of media towards the idea of an organic work consisting of what can only be described as the mystical interaction, and transubstantiation, of living elements. In this regard Appia proposed a new hierarchy of substance spanning mobile (performative) and immobile (representative) media, book-ended by music and architecture. Parallel research into the visual arts was eventually conducted at the Bauhaus during the 1930s

under the direction of Moholy-Nagy. It is this same ethos that Walter Gropius went on to disseminate via *The Architect's Collaborative* established after his move to the United States in 1944 in pursuit of "total architecture".

Another significant event in Appia's career was his long-term collaboration with the founder of eurhythmics, Emile Jaques-Dalcroze, on a series of integrated stage sets designed to instigate a new "rhythmization of life". This connection would indirectly bring him into contact with leading architectural figures such as Le Corbusier, who visited his brother Albert Jeanneret at Jaques-Dalcroze's Institute of rhythmic gymnastics near Hellerau, Germany (De Michelis & Bilenker 1990). Appia's own description of the "mutual correlations" at work in synaesthetic space resonate with the attitude adopted by natural scientists towards the physical action of nature: "For our eyes then, *living* space – thanks to the intermediary of the body – will be the resonator for the music, so to speak. One could even advance the paradox that inanimate spatial forms, to become *living*, must obey the laws of a visual acoustics" (Appia 1922, original emphasis).

Appia's relevance to the topic under discussion – the shift from dialogue to collaboration - is supported by his documented interest in Schopenhauer's philosophy of will and causality. In an essay from 1836, *Physical Astronomy*, Schopenhauer claimed that two integrally related causal chains (external natural force and internal volition or will) coincide in higher beings. The distinction between cause and effect is said to rest on *intermediaries* that vary according to scale of impact, tangibility and refinement -causality becomes unintelligible when discontinuities appear in material reality as direct action becomes unreadable (Schopenhauer 2007: 319).[3] For Schopenhauer both science and art offered techniques for tracing refined, collaborative transmissions of force and will at work in all areas of life. Collaboration was therefore a broad philosophical term covering not only the renewed synthesis of the arts, but wider speculations on rhythmic interaction, transubstantiation, and the invention of sensitive, expressive media. Appia would in turn set out his own philosophy of collaboration in a 1922 essay "The Intermediary" which refers to this process as "transmission":

> I can hardly imagine a machine that does not obey the principle of the transmission of power. In all probability the same is true of human beings. At any rate there is nothing to suggest that it is not; everywhere transmission of power is evident; in the tiniest of our organs as well as in the largest of our institutions. We prove this when we speak of the latter figuratively as of a social organism. Hierarchy, indispensible to social life is, after all, only a series of transmissions….We avail ourselves of all the electricity we can, except the great electric power of mankind (Appia 1989: 321).

Appia believed that only the continual refinement of articulation would enhance receptivity; a sort of psychological determinism forcing human understanding into direct contact with a field of less tangible spiritual drives and powers. Another Swiss theorist, Paul Klee, held similar views, describing the artist as a "channel" "stirred by the flow of life." Two years after Appia developed his own philosophy of collaboration Klee (1948: 15) went on to claim, in a statement fusing natural science with aesthetics, that an artist "neither serves nor rules – he transmits".

Re-animating heavy matter

The background conditions which led to the emergence of collaboration can also be located in Hegel's rewriting of architectural history (*Lectures on Aesthetics*, 1837), a project which sought to reconceptualise the medium as fundamentally limited by heaviness and inertia. Hegel can be said to have written the first interdisciplinary history of architecture, reordering its past along the lines of a natural history of material states. Later theoretical speculation, suggesting that architecture was progressing towards a more heightened responsive state of dematerialisation, owed much to this misappropriation. Such were the pretensions of Hegel's grand narrative that it permitted individual forms to be wrenched from their place within a meaningful tradition, and

re-positioned somewhere along a spectrum of animate-inanimate material states. As a result the constituent 'parts' and orders set out in traditional treatises were instantly re-classified as time-based, performative 'elements'. This is made clear in the *Philosophy of Nature* (1817) which states that "shape must in the end also display itself as…the outcome of a process" (Hegel 1970: §325, 232).

The cultural history set out by Hegel operated on the basis of drawing parallels between natural and artificial processes of change. In architecture, which was considered the least developed and most limited art, this amounted to a "sublation" of heavy matter through repeated cycles of refinement. A "lively material" was therefore defined as one that "displays the stir and beating pulse of the free life itself" (Hegel 1975: VII 617). The broader moral agenda is critical, for the more elemental and refined the medium, the greater the capacity of an art form to effectively transmit and express inner will. The more "plastic" or "heavy" the material, the less spiritually developed the art was considered to be. Speech, music and drama for instance, are lighter and thus less resistant to spiritual permeation. As a result – and this is the fundamental point –it is more difficult for spirit, consciousness or some other animating force to 'ex-press' and outwardly 'ex-hibit' itself through architecture's dense medium. "Amongst the *means* hitherto considered" states Hegel, "sound [is] the sensuous material still relatively the most adequate to spirit" (Hegel 1975: vII 626). From this point onwards architectural development was measured against a scale ranging from the inanimate and colossal, to the animate and elemental. Owing to its fundamental inability to fully synthesise such categories, architecture was positioned near the base of a revised science of expressive aesthetics.[4] Hegel's contribution – some might say deception - was to have transformed the internal tensions and syncretic materialism favoured by dialogue, into the driving forces of utopian cooperation and cultural redemption. The desire to flatten the material amplitude of architecture propelled the subject into a long-standing civil war with its own medium, a conflict that could only be resolved through the eschatological pursuit of a condition devoid of material hindrance.

Economy

Early 20th century theories of collaboration circulating in art and architecture gathered some of their legitimacy from elemental concepts smuggled into architectural technology from natural philosophy. It was an attitude encompassing a broad range of concepts from organics and integration, to the economical use of materials. Economy for instance referred to direct channels of action within a system or body, whilst organics promoted the immanent fusion of process and product. What they share is a common reliance upon the re-structuring of creativity in terms of efficient causality and conservation, sometimes referred to as the transmission of natural agency (*kraft*) into artificial craft (*handwerk*). (Van Eck, 1994) As M. Norton Wise (1989: 269-70) has observed, by 1845 the "[c]onservation of force arose from, and further motivated the search for unity in nature, for the ultimate identity and interconvertabilty of all natural powers.

When viewed against this background, the most efficient work is non-representational, i.e. a direct and unmediated presentation of action. This synchronised collaboration of mind, hand and matter would in due course crystallise into 'truth to materials', that well-known slogan reducing form to material substance, with 'resistance' (inefficient causality) arising from a discrepancy between the two. In 1924 Moisei Ginzburg for instance describes this immediate interaction between "energy of the material" and the labour process as *faktura*, leading to his central distinction between use and waste: "The material that 'does not work'…will be useless and superfluous, and thus will have to be removed from the composition" (Ginzburg 1983: 87). Ginzburg's Marxist background dictated that authentic labour only occurs when there is a 1:1 correspondence between process and product, that is to say, when materials are saturated with "definite masses of congealed labour time" (Marx n.d.: 183). In fact Marx himself was

very clear on this point, continually emphasising the organic connection between force, action and material. Only when human action is "directly transferring labour to its subject matter" can materials become revitalised and reanimated by *kraft*: "Living labour must seize on these things, must rouse them from their death-like sleep, must change them from potential use-values into real and kinetic use-values…and, as it were, animated." (Ibid.: 176) This enabled Marx to outline two routes by which products can be assembled. This is set out in a section from *Das Kapital* entitled "The Two Fundamental Forms of Manufacture: Heterogeneous Manufacture and Organic Manufacture":

> Manufacture is divided into two fundamental forms….This twofold character arises from the nature of the product. Either the finished article is formed by the simple mechanical fitting together of partial products independently made, or else it arises thanks to a series of *interdependent processes* and manipulations (Ibid., 350-60).

Here, as making is turned into an collaborative affair, product and process become virtually indistinguishable to the extent that "to live and to labor for life will have become one and the same" (Marx, as quoted in Arendt 1958: 21).[5]

Elemental refinement

It is no accident that modern architectural theory often drew parallels between elemental refinement and the design process. Having passed through manifold stages of intellectual development involving both science and the humanities, by 1920 the 'element' had condensed into an overloaded syncretic notion (Deane 2006). The 'elementary' paradigm proliferated during the 18th century in a wide range of disciplines that first equated reduction and simplification with historical progress.[6] German Romanticism would in turn adopt the element not as a formal idea, but as an interdisciplinary process designed to re-vivify creativity and forge a common ground with physics.[7] Karl Bötticher's *Die Tektonik der Hellenen* (1843) was the first modern treatise to exploit the theoretical significance of the 'element', referring to the 'parts' of buildings as *glieder* or *membra*, with unity defined as "body scheme of members" (*Körperschema des Gliedes*)(Bötticher 1874: 8 & 20). Bötticher then makes an interesting conceptual move, breaking down the 'part' into two "elements" and reading them as two opposing forces: the *werkform* (tectonic "core-form") and the *kunstform* (atectonic "art-form"). Bötticher explained this differentiation of the 'part' into two 'elements' in the following terms:

> The concept of each part can be thought of as being realized by two elements: the core-form and art-form. The core-fore of each part is the mechanically necessary and statically functional structure; the art-form, on the other hand, is only the characterization by which the mechanical-statical function is made apparent (as quoted in Hermann 1984: 141).

A long-term consequence of this refinement of the 'part' into two elemental processes of inner force and external expression was that it instigated closer interaction of performance and representation. However, it was simply a matter of time before the performative dimension to the 'element' would carry greater relevance in the revolutionary climate to come. In the wake of Romanticism's association of the term with the replenishment and reinvigoration of form, converting traditional motifs such as nous, ether and *pneuma* into modernist redemptive concepts of air, energy and light was straightforward. The significance of the 'element' lies in its simultaneous convergence of functional vitalism, the integration of media (Appia's "intermediaries"), transparency and dematerialisation. The purpose of artifice was no longer the creation of a dialogically interwoven *physis* jointly configured from environmental, cultural and historic continuities, but the literal collaboration of form and a context flattened down to elemental performance. On one level this ambiguity produced brief periods of epistemological overlap, particularly where scientific concepts drifted laterally in the direction of the creative process. On another it simply allowed for the displacement of the dialogical purpose of architecture by seamless collaborative processes, and smooth creativity.

Pursuit of the 'itself'

When combined into a multifaceted ontological shift the combined impact of transmission, economic action, animation and elemental refinement upon dialogical creativity was far reaching. The hidden objective holding all four impulses together is the pursuit of the 'itself', or non-representational architecture. The consequences of the shift would only become clear following the gradual reclassification of architectural materials over the course of the 19ᵗʰ century as organically integrated, elemental states, culminating in the 20ᵗʰ century redemptive process known as dematerialisation. To be sure, when all of the social and technological rhetoric legitimising the modern movement is stripped back the residue we are left with is 'integrated living matter'. Here are two examples, the first by Eric Mendelssohn from 1919: the "coincidence of the volition…will find expression in the resulting work and will bring all the arts back into a unity." (Mendelsohn, 1919, in Ulrichs 1971: 55) Secondly, four years later came this congruent statement from Mies: "Authentic form presupposes authentic life….Life is what matters" (Van der Rohe 1991: 257). The unacknowledged motive behind both statements is the pursuit of the 'itself' – a type of architecture highly attuned towards immediate collaboration with environmental forces. The extent to which this agenda has permeated our present condition is revealed in the following account of process-products:

> Can the forces that make the object…combine with an intelligence of fabrication to become a 'process-product'? Here the form, the forces that shape it, and the assemblage of materials in which we execute the ideology are part of the same gesture. This…is a search for a common language between design and execution (Sharples, Holden, Pasquarelli 2002: 9).

The scope of collaboration now reaches far beyond co-labouring humans into a hyper-integrated field of animate components and digital fabrication. The goal however remains unchanged – the pursuit of presence – and may be interpreted as an extension of modernism's infatuation with 'second natures' albeit escalated to a new level of expertise. The impact of refined 'elemental' thinking on the poetry of architecture has been dramatic, allowing representation to be replaced by process-based thought, whilst limiting the meaning of artefacts to literal performance and immediacy at the expense of non-literal correspondence. This could explain why the key word in current debates surrounding the value of collaborative making is *rhizosphere* – a reformatted communicative field that, rinsed of potentially difficult translation, flattens the project space into an unambiguous plane.

Negative dialectic

Dialogue and collaboration both describe ways of moving through design and negotiating pathways through its middle ground. However, it could be argued that the essential difference between the two modalities is that dialogue shows a greater tolerance towards the "mangle of practice" (Pickering 2002). The relative spectrum of stratified thicknesses (taken in both the physical and experiential sense) that make up architecture's intermediate realm are viewed as an opportunity rather than a hindrance. Embracing uncertainty in a non-reductive manner through the creative use of human judgement and doubt leads in Alvaro Siza's terms to "a learning process which is balanced and not anxious". The philosophy of collaboration by contrast *is* driven by anxiety, viewing tension and conflict as a deficiency rather than a space for reconciliation, hence its saturation of the middle ground with overly-deterministic integration strategies that flatten the vertical axis of poetry and meaning. It is a shortcoming which any renewed relationship between instrumental and existential knowledge must surely acknowledge.

There are signs that the gradual repression of architecture's dialogical imagination may well be undergoing a slow reversal or negative dialectic. In a short essay from 2002,

The Ontology of Construction, Adam Caruso contrasts two views of Brinkman and van der Vlugt's Van Nelle Factory in Rotterdam (1925). An iconic frontal image showing the integrated language of the Modern Movement is contrasted with a less visually composed view of an extendable rear wing. Despite being less photogenic at this more awkward obscene end, here is where the vital tectonic conflicts at work within the project are unintentionally exposed. Such moments illuminate elements which have yet to settle into a smooth composition of parts, thereby revealing the potential material dialogues that enrich architectural character and enhance readability. The contemporary recovery of "subtle distortions" of course owes much to the Smithsons' interest in the rough poetic disturbance of hyper-integrated architecture. Their faith in democratic functionalism may have disappeared but the deeper intention behind Caruso's renewal of 'anti-oligarchic reform' is the ethics of dialogue, which ensures human experience moves in a related way across the broad manifold of existentially relevant perceptions and conditions naturally encompassed by architecture. As the founder of Black Mountain College (the setting for Buckminster Fuller's geodesic prototyping) John Andrew Rice put it, "life is a texture, a context, in which all thoughts and colours are at once cause and effect." (Rice 1942: 338).

Notes

1. Here I am thinking of the combination within a classical temple of hypostyle hall, Mycenaean megaron, archaic Greek *hekatompedos*, not to mention the latent figurative and craft potential of Classical Greece.

2. This quotation is taken from an unpublished transcript of a lecture hosted by the University of Nottingham on the 25th January 2009 as part of its 'Making Architecture' series.

3. "We recognise, I say, firstly the essential identity of causality under the various forms it is forced to assume on the different degrees of the scale, as it may manifest itself, now as a mechanical, chemical, or physical cause, now as a stimulus, and again as a perceptible or abstract motive: we know it to be one and the same, not only when a moving body loses as much movements as it imparts by impact, but also when in the combats of thought against thought, the victorious one, as the more powerful motive, sets Man in motion, a motion which follows with no less necessity than that of the ball which is struck" (Schopenhauer 2007: 319).

4. Accordingly, there will always be a gap between the body of architecture and the following account of an animate body: "The human body…stands in this respect at a higher stage; since in it there is everywhere and always represented the fact that man is an ensouled and feeling unit. The skin is not hidden by plant-like unloving coverings; the pulsation of the blood shows itself over the entire surface; the beating heart of life is as it where present everywhere over the body and comes out into appearance externally as the body's own animation, as turgor vitae, as this swelling life. Similarly the skin proves to be sensitive everywhere" (Hegel 1975: v.I 142).

5. It is instructive to note Hannah Arendt's criticism that the labour process is essentially a cycle of consumption that produces the least durable products: "The least durable of tangible things are those needed for the life process itself" (Arendt 1958: 96).

6. The British Library for instance holds in its collection approximately four hundred and seventy remarkably similar-sounding volumes written in French between the 1709 and 1850 covering subjects as diverse as pyrotechnics, chemistry, politics, geology, geometry and architecture, all of which carry 'element' in the title. The architectural encyclopaedia comparable in style, scope and intention is Neuffort's *Elementary Compendium of Architecture* from 1754, a text containing hundreds of diagrams covering every conceivable typology, an approach that culminated in Durand's *Precis* of 1802. Elementary design was a process of abstraction that by extracting the core structure, produces diagrammatic regulations. Stripped of all analogical reference, these are not abbreviated reflections of the world, but the formal elementary bones on which to base its instrumental reconstruction.

7. Friedrich Schlegel (1991: 103) managed to capture this loose aim in precise words: "[E]ven a physicist… has raised himself up from the depths of physics to the level of intuiting poetry, honouring the elements as organic individuals, and pointing out the divinity at the heart of matter."

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