Part Problems / Problem Parts

For many disciplines, problems insight panic, initiate methodological protocols, signal something has gone wrong, catastrophe awaits, attention is required and action is needed to rectify the situation, or are catalyst's that establish a collectively agreeable solution. Problems are to be solved, located in a conceptual binding of right or wrong, working or not, or true and false. There are many examples of this from many disciplines.

'ARCHITECTURE HAS 99 PROBLEMS, BUT A _____?____ AIN'T ONE'

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For many disciplines, problems insight panic, initiate methodological protocols, signal something has gone wrong, catastrophe awaits, attention is required and action is needed to rectify the situation, or are catalyst's that establish a collectively agreeable solution. Take mathematics as one of the more obvious cases. The math problem has a solution that can be found by using the requisite set of techniques, all one needs is the code. In science, the scientific method is a specific process providing a universal methodology against which solutions to problems can be evaluated and held accountable to alternative outcomes in order to reach an agreement. On the order of the everyday, if your car fails to start, the mechanic can identify the problem and we understand it to be fixed when the car starts, problem solved. Yet in architecture, like other creative disciplines, problems are not in binary relation to solutions, but rather are issues that arise from the history of ideas, often revealing new problems, that cannot be solved but can be worked on. Paul Rudolph made clear the problem of the architectural problem in reference to Mies Van Der Rohe, stating "All problems can never to solved…Indeed it is a characteristic of the twentieth century that architects are highly selective in determining which problems they want to solve. Mies, for instance, makes wonderful buildings only because he ignores many aspects of a building. If he solved more problems, his buildings would be far less potent."[1] Yet, these issues are also not merely subjective, nor are they necessarily philosophical. Problems arise out of disciplinary history often requiring attention to construction methods, assembly, material tolerances, structural expression, formal technique, or aesthetic ideologies. The problem factor in architecture is hermeneutic as well as material, or projective. Problems are often developed from historical ideas as fodder for new architectural alternatives of today. In the foreword to LA Under The Influence, Bob Somol claims "Architecture, it seems, progresses only as old answers dissemble themselves through new questions."[2] In this way, problems often become Projects, or a repeating aspect of individual

works that appear over time across an architect's (or group of architects) work, and which may be inherited by a future generation. Andrea Palladio's 9-sqaure grid problem of his villas, for example, and their subsequent intellectual adoption by Rudolf Wittoker and formal adaptation by Le Corbusier can be seen as both a problem and a Project. There are, however, a lot of problems in architecture. There are, or course, the problems that are even external to the discipline, such as environmentalism, sustainability, politics, economics, and so on. But those problems are really more concerned with factors outside the immediate palette of the architect. They represent the problems of spheres beyond the discipline of architecture and belong to larger governing criteria in cultural systems. So, what is really at stake with an architectural problem are those central to the discipline; problems that may be taken up internally without being the consequential responses to all other cultural systems. This does not mean, however, that they cannot affect those problems. They very much can, but the origins of influence arise from inside the discipline itself.

Louis Kahn famously remarked "You say to a brick, 'What do you want, brick?' And brick says to you, 'I like an arch.' And you say to brick, 'Look, I want one, too, but arches are expensive and I can use a concrete lintel.' And then you say: 'What do you think of that, brick?' Brick says: 'I like an arch.'"[3] There is a lot embedded in this mock-conversation between brick and architect. There are structural, economic, and aesthetic contingencies that lie outside the brick problem. Yet, there is a more subtle problem lurking here, sneaking in in the most cunning of ways. The polemical positioning between a brick and a monolithic concrete lintel points towards another architectural problem. No, not the brick problem, per se. Rather, the bricks relation to an arch form. Said more plainly, the problem of part to whole relationships in formal composition.

START PARTS / PLAY PARTS

Any admissions review process to schools of architecture is invariably littered with stories of applicants recalling childhood memories playing with LEGO's. The frequency with which this seemingly pervasive cultural toy is referenced is possibly a panicked sign of an eager architect-to-be, ready-to-learn student slogging through personal history looking for a competitive edge or searching for a deeper, more prolonged fascination with architecture that may or may not really exist. Perhaps this is a whole other problem. Regardless, this annual courtship does point toward a larger, more fundamental condition in the conceptual understanding of architectural form, space, and order; the composition of wholes from parts. In this form of architectonic child's play, the resultant Lego construction does not solve, nor respond, to any problem other than its own construction and aesthetic choices. It is purely a creative act and a wilful arrangement of parts into a desirable form that develops its own problem through composition. Within this compositional, low stakes play, intuitive responses to the composition of parts initiate and provoke aesthetic and intellectual (decisional) problems through the act of aggregation.

ASSEMBLAGE PARTS / AGGREGATE PARTS

It is first useful to differentiate part to whole relationships from an assembly. For our purposes, part to whole relationships are concerned with the composition of formal and spatial aesthetics, not with the assembly of architectural elements, such as wall, roof, column, or floor assembly. For example, a window assembly is constructed with a series of framing members to make the opening in a wall,

mullions which hold the glass and nail on or clip onto the framing. Between the framing and mullions flashing and weather sealant is installed to prevent moisture migration and thermal breach. Over the framing, interior and exterior sheathing is attached and some form of finish, whether it be cladding, paint, veneer, etc. followed by some type of trim. This is the assembly, and while made of parts, it is the totality of the window itself that is to be understood as the part in the overall composition of the whole, presumably façade in this case.

With this, we can differentiate an assemblage from an aggregate in part to whole relationships. An assemblage is not dissimilar from collage in that it is a combination of dissimilar parts that when in proximity produce a formal or compositional whole. "Assemblages are non-modular constructions where each and every part is unique in shape and dimension. Variations are not random, but are derived from the overall composition of a whole."[4] An aggregation, on the other hand, is a collection of like parts that combine in some manner in the production of a whole, yet which are not reducible to a simple logic of modularity, say stacking brick without some manner of disruption, change, or complexity. "Aggregations are instances where modular components are complexly connected to produce a mass or form that is not simply reducible to a single modular logic of assembly."[5] Think, Moshe Safdie's Habitat 67. The distinction between assemblage and aggregation is key to understanding the contemporary and historic problem of the part, or part problems. From this we may begin to further differentiate issues pertaining to form-making and the possibility for working between assemblage and aggregation. In order to do this, it will be useful to expand the discussion on contemporary history in relation to parts, fields, blobs, and primitive geometries in order to establish disciplinary grounds for the contemporary problem of parts.

FINE PARTS / FIELD PARTS

The Micro Megas (1979) and Chamber Works (1983) drawing series by Daniel Libeskind can be characterized by the disjunctive aesthetics of an assemblage of parts while implicitly focusing attention onto parts in relation to tectonics and the architectural detail. These drawings further evidence a relationship between parts and field conditions. Though these parts are disjunctive and characterized by an incoherency of the whole, they nevertheless establish a series of relationships in which intricacy, detail, complexity, and multiplicity are agents for visual effects in a relational field. These drawings, with their attention to fields composed of an assemblage of fine parts, suggest temporality and dynamism where multivalent propagations may occur and effects emerge and recede within an overall composition. Sanford Kwinter with Michel Feher wrote in the inaugural 1986 issue of Zone about the synthesis of chaos theory, non-euclidean geometry, and complex non-linear thinking in which fields of intensities, forces, and perceptions acted on a distribution of parts and vectors in dynamic, temporal flux as a new condition of architectural production.[6] At this stage of intellectualization, the promise of chaos, temporalities, and dynamic aesthetics surely seemed a refreshing alternative to the last remaining pillars of post-modernism. Deconstructivism, a borrowed term from Jaques Derrida's 1967 work, Of Grammatology, and philosophy of Deconstruction, effectively envisioned the world as fragmentary, disjunctive, and denies a pure presence or stable meaning. With this, the aesthetics of deconstructivist architecture had little choice but to appear as assemblages of disjunctive, fragmentary, and unstable parts precariously tangled in a whole. This was emphasized by concentration on tectonic expression that aimed to dismantle architectural history, which was counter to

previous generation's use of 'pomo' visual cues to enlist history as a participant in the experience of architecture. Yet, this form of tectonic expression of structural parts was also counter to Kenneth Frampton's calls for tectonic, rather than sceneographic expression. Where Frampton described tectonic expression as a constituent in the palette of architectural history and disciplinarity[7], deconstructivist architecture saw the disjunction of tectonic parts as a way to break with architectural history. These conditions are present in many of the works in the 1988 exhibition, Deconstrivist Architecture, curated by Philip Johnson and Mark Wigley with work by Zaha Hadid, Peter Eisenman, Rem Koolhaas, Coop Himmelblau, Bernard Tschumi, Frank Gehry, and Daniel Libeskind. This attitude toward parts was not, however, forever limited to techniques based on deconstructivst ideologies and aesthetics, but rather would later find itself relocated as a cornerstone in the new promises of digital technology where it would transition from assemblage to aggregate.

The digital project of the 1990's and early 2000's, with its initial advocacy for smooth, folded, pliant, supple, and continuous surfaces[8], initiated a movement away from parts as intellectual and aesthetic contributors on one hand. Yet on the other hand, the digital project made more accessible vectorial forces, variable relational fields of parts, and the complex tectonic intricacy of parts in aggregate. More specifically, fineness[9], graded component fields responding to implied forces, and scalar gradations claimed parts as constituents in overall compositions of fields characterized by increasingly small and fine members in an intricate lattice of visual effects. These small and fine members could constitute an assemblage or an aggregate in which the fusion of multiple and different systems into one that behaves as a singularity constituted the terms of complexity.[10] This period is heavily marked by the development of digital effects and increasing virtuosity with codes capable of producing increasingly high and fine fidelity to the point that the discipline moved "from an understanding of the architectural detail as an isolated, fetishized instance within an otherwise minimal framework...[to] in an intricate network [where] there are not details per se, detail is everywhere, ubiquitously distributed and continuously variegated in collaboration with formal and spatial effects."[11] This is evident in the pervasiveness of digital effects produced over the last decade showcasing graded component fields, computational fields, vectorially composed parts in global flux under external forces, and the 'ubiquitous detail' enabled by computational and parametric processes or the representation of flows through the composition of increasingly small parts. References to natural systems and sceneographic effects held together with tectonic fineness, intentional or not, is unavoidable in this work. We may, however, recall Robert Venturi's claims against picturesqueness and serenity by stating "it's intricate forms do not reflect genuinely complex programs, and its intricate ornament, though dependent on industrial techniques for execution, is dryly reminiscent of forms originally created by handicraft techniques…This kind of complexity through exuberance is the antitheses of serene architecture…"[12] Nevertheless, noticeably different in this work from the relative crudeness and disjunctions of deconstructive relationships is the ambitions for continuity and synthesis of part-to-part and part-to-whole relationships. Part-projects developed within the digital environment often fall into one of two broad categories. Those that begin with a single component or element, such as an agent, a tube or some geometric tile where difference is achieved through variables in relation to successive components or forces in a field as it propagates and tectonic intricacy can be increasingly amplified.[13] Or, on the other hand, a

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global form that is segmented, sliced, and broken up into a series of articulated, contiguous or interlocking parts either as surfacing tiles, egg crates, or "undulating lattices"[14] of networked parts. Both processes have become an increasingly computational effort characterized by the aggregation of ever finer parts responding to applied forces, or where parameters allows for variation across a field in which fabrication technologies are less and less the obstacle they once were in the physical construction of 'complex' forms.[15]

However, as renewed attention to objects, history, figures, coarseness, volume, and association appear to be supplanting the last two decades of work dedicated fields, novelty, gradation, elegance, surface, and sensation[16] it appears the problem of parts is again at the forefront of a contemporary discussion and debate. Perhaps this is an appropriate time to reconsider 'fineness', micro-articulation, and tectonic intricacy of parts through a lens of post-digital formalism.

SOFT PARTS / SLUMPED PARTS

Counter to the tectonic fineness and intricacy of small parts, 'blobby' parts alter the discourse on tectonics in general, and fineness specifically. "Many blobs, of all different sizes and shapes and irreducible typological essences…threaten to overrun a terroirzed and deterritorialized tectonics like a science fiction horror movie."[17] Perhaps, aspects of this can be found in Greg Lynn's Blob Wall. We must, however, admit that this is also dangerously close to the brick problem. Nevertheless, it initiates an alternative to the small and fine parts of digital tectonic intricacy by offering a kind of meta-ball softness at a scale which aims not for high and fine fidelity, rather for a low res specificity of coarseness with regard to the scale and density of parts. If allowed to be seen in a parallel to resolution, these parts could be seen as a shift from 300dpi to 72dpi with regard to fineness and intricacy. In this relief of visual fine-grained complexity, what is gained is the aesthetic autonomy and qualities of the part itself. This is to say that the part-to-part sensibilities reclaim and refocus attention onto the peculiar qualities as parts, rather than the intricacy or effects of the field. What this ultimately suggests is the introduction of parts which constitute their own, isolated figure. In the case of Lynn the meta-ball is held superior to the primitive for its multiplicity of rotund effects and internal differentiation despite its continuous exterior. "Unlike a conventional geometric primitive, such as a sphere, which has its own autonomous organization, a meta-ball is defined in relation to other objects. Its center, surface area, mass, and organization are determined by other fields of influence."[18] We might also consider the work of Andrew Holder of the LADG. In particular, his 48 Characters project or work done in his Possible Mediums workshop at The Ohio State University in 2013. In this work plaster is cast in balloons and poked and nudged into various slumped and nestled parts that snuggle onto each other as they stack in ways not dissimilar from Roxy Paine's Scumak sculptures. However, unlike Paine's work, Holder uses the part as a means to construct autonomous figures and objects in their own right. Each part is unique in form, though common in material, locating them somewhere between assemblage and aggregate. Also unique to these are the deformation of parts in relation to other parts that they come into contact with. Like the fine fields of the digital project, these works imply or require the element of external forces and pressures as a pre-condition of the part's figuration. Where Lynn's Blob Wall eshews the primitive for their 'reductiveness' and favors the meta-ball, the emphasis on character in Holder's figural parts is less concerned with whether they are a primitive or not, rather cares more for the associations they connote and the disciplinary
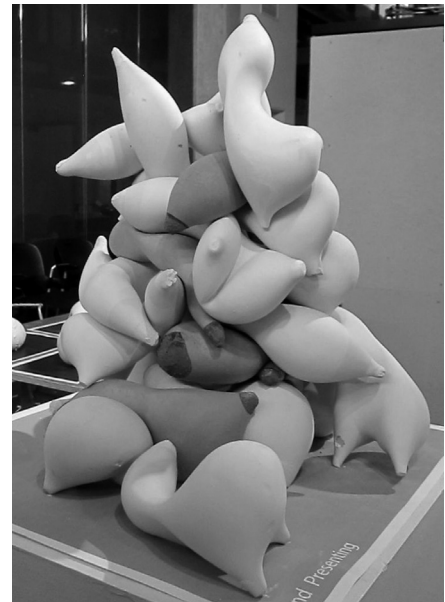
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Figure 1: Work from Andrew Holder's Possible Mediums Workshop at Ohio State University

concerns of figuration. In Holder's work, the role of association supplants sensation, meaning the parts take on animate qualities that associate with things like bellies, utters, and "piglets". "What we struggle to rationalize in the language of geometric analysis, the languages of character and posture easily accommodate: the piglets nestle and suckle, the sow sprawls, obese bodies squeeze and abut one another. The work of repetition and aggregation is offloaded to character."[19]

PRIMITIVE PARTS / PRIVATE PARTS

One wonders, if it is possible to combine the elements of the 'fine field' with the 'figural part' as a synthesized whole? Or, said another way, can parts initiate a visual oscillation between part and whole; one that is between the fine field, tho not as a structural lattice, and part as figure? In so doing, what may be produced is an architectural formal object that is the synthesis of the composition of variably sized parts, yet its associations belong to the whole. Perhaps we should not be so quick to eschew the primitive solid here. After all, two decades worth of formal exuberance suggest that perhaps the invention of new forms are no more potent than reconstituting old ones. To this, we might also address the issue of scale. What fields of small and fine parts cannot accommodate volumetrically, primitive solids do with ease. In fact, the 'coarse' primitive part is both part and whole simultaneously. Thus, the reductiveness that Lynn cites of primitives in fact becomes beneficial in part problems. A simple example would be OMA's 1989 Zeebrugge Sea Terminal proposal that sought to produce a "form that resists classification" by combing a sphere atop an inverted cone with an explicit ambition to "poeticize the pragmatic."[20] This poeticizing the pragmatic, notably here through strategies of aggregation rather than formal singularity, parallels Colin Rowe's claims for functional expression of the interior on the exterior, but does so in the spirit of a Rossian irreverence to typological formalism, as noted in the claim that the project resists classification. In this we find the potentials of aggregating un-manipulated primitives to be a likely scenario of combining coarse parts in the production of figural and volumetric wholes. Owing to this, combining spheres, cones, and cylinders as constituent parts that are synthesized into expressive masses and wholes produces forms that are in a part-to-whole-as-figure relationships characterized by rotund volumes, multivalent cleavages and clefts, and taut yet bloated bodies.


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Scalability and inherent volume of primitive geometries promote their capacity to adopt varying programmatic responsibilities and to adapt to varying contextual sensibilities or cultural and economic contingencies that were once said to be the attributes of supple and pliant surfaces.[21] This condition allows an

Figure 2: Sphere, Cone, & Cylinder models

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understanding of parts that is not constrained to structural lattices or fine fields fluxed by external forces, rather embraces coarse scales of primitive parts and volumes in aggregated forms residing between a field of parts and single, figural mass. Where, in fine fields detail is 'everywhere', detail in the aggregation of spheres, cones, and cylinders occurs as the expression of intersecting parts, a condition of geometry rather than effects of density and intensity. The cleavages and clefts define separate parts as well as unite and synthesize them into figural wholes. In these part-to-whole figures inherent preference is made for an architectural volume. This is different than a surface that takes a differentiated component, or a component which propagates while responding to external forces. In this way, the status of architectural form is reinstated, returning to a disciplinary project of form-making with parts and part-to-whole relationships.

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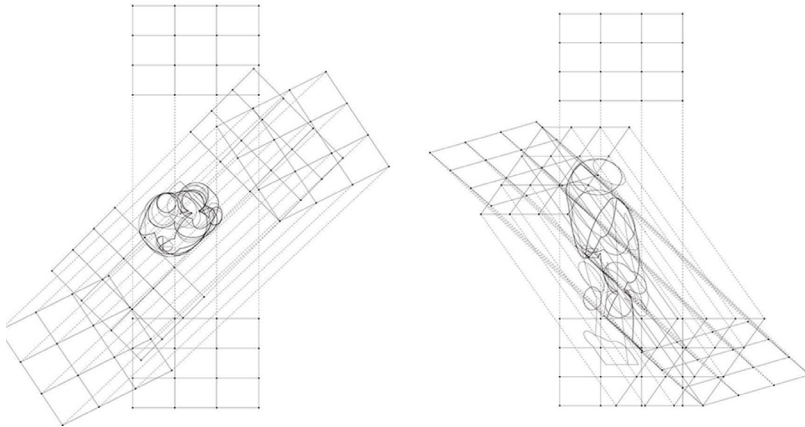
To exemplify this, we will look at a belvedere by the author of this text. The Belvedere sits atop a buried, abandoned, cylindrical missile silo, extending it vertically with four intersecting cones of equal base diameters to that of the existing silo, topped by a crown composed from 11 spheres, 20 cones, and eight cylinders. These recognizable spherical, conical, and cylindrical parts come into and out of focus within the overall mass, both alleviating and frustrating recognizability with a visual oscillation between legible parts and figural wholes. The autonomy of the parts, unlike Holder's characters, cannot on their own achieve such qualitative terms. However by aggregating similar parts, figure and character arise in relation to the composition of the whole.

The Belvedere aggregates 10 small spheres (1/50th the size of Newton's Cenotaph) connected to an eleventh crowning sphere with cylinders and cones. By nature of aggregating 10 spheres with cones and cylinders, the Belvedere does not have a frontal face, yet it is graphic with figural profiles composed by aggregated volumes, and is therefore characterized by multiple figural profiles. Each of the 10 spheres are cut horizontally in half, forming domes. The vertical locations of each of the 10 domes are located in such a way as to neither overlap, nor appear as autonomous, therefore aggregating into one figural-mass. Four of these directly connect to the four cones of the tower base, providing access and structure. This provides the Belvedere with a specific, singular orientation in the z-dimension yet lacks frontality or facial expression. The formal synthesis of aggregated and intersecting parts produces clefts and cleavages as exterior expressions and articulations derived from functionality and interior use, recalling Rowe's and Simmel's claim for an exterior articulation of interiority, as well as
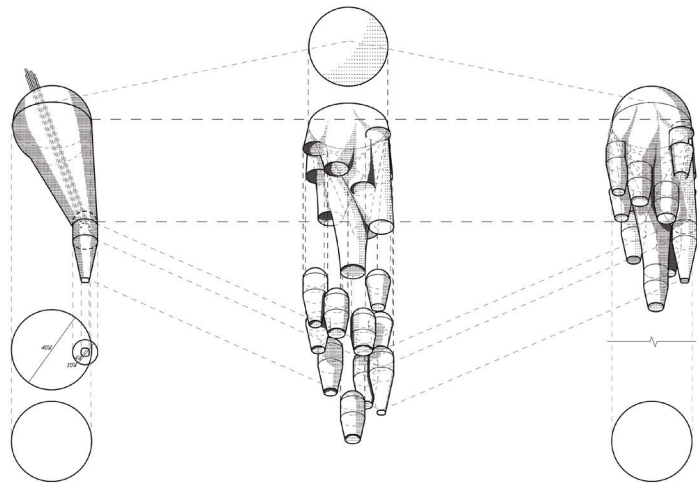
ENDNOTES

1   Robert Venturi, "Complexity and Contridiction vs. Simplification or Picturesqueness" in Complexity and Contradiction in Architecture. Museum of Modern Art, NY. 1966. 24

2   R.E. Somol, « Introduction » in LA Under The Influences by Roger Sherman. University of Minnesota Press, 2010.

3   Louis Kahn, http://www.brainyquote.com/quotes/authors/l/louis_kahn.html (original source unknown)

4   Greg Lynn, Intricacy Exhibition introduction at the Institute of Contemporary Art, University of Pennsylvania. 2003

5   Ibid

6   Sanford Kwinter, "La Citta Nuova: Modernity and Continuity", Zone 1/2. 1986

7   Kenneth Frampton, "The Glass House Revisited", Catalogue 9, Institute For Architecture and Urban Studies, September 12 to October 31 1978. 39-59

8   This is referenced to Greg Lynn's "The Folded, The Pliant, and The Supple" article.

9   This is a direct reference to Jesse Reiser's 2006 article, "The New Fineness" in Assemblage.

10   Greg Lynn, "Blob Tectonics, or Why Tectonics is Square and Topology is Groovy" in ANY #14, 1996. 173

11   Greg Lynn, Intricacy Exhibition introduction at the Institute of Contemporary Art, University of Pennsylvania. 2003

12   Robert Venturi, "Complexity and Contridiction vs. Simplification or Picturesqueness" in Complexity and Contradiction in Architecture. Museum of Modern Art, NY. 1966. 25-26

13   Bob Somol, Lecture at University of Kentucky College of Design. 2011

Figure 3: Re-parting sphere, cone, & cylinder objects with grid projections

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14   Greg Lynn, Intricacy Exhibition introduction at the Institute of Contemporary Art, University of Pennsylvania. 2003

15   Bob Somol, Lecture at University of Kentucky College of Design. 2011

16   This observation is made by a close read of recent scholarly essays, journals, and conferences occurring over the last 2 years. In particular the conceptual distance between Log 17 and Log 31 serve as evidence in this paradigmatic shift. Other publications, such as AD and Project Journal articulate this shift, while a series of conferences and workshops, including those held in 2013 at Syracuse University, the University of Michigan Taubman College of Architecture + Urban Planning and the upcoming ACSA 103 Conference themes are indicative of the stated position. This is also observed in the growing adoption of Object Oriented Ontology (OOO) as a philosophical framework which moves away from forces and effects towards qualities of and between objects.

17   Greg Lynn, "Blob Tectonics, or Why Tectonics is Square and Topology is Groovy" in ANY #14, 1996. 169

18   Ibid, 174

19   Andrew Holder, 48 Characters. Dimensions, vol. 27 Fall 2014. Taubman College of Architecture + Urban Planning journal. 89-95

20   OMA project description excerpt from http://oma.eu/projects/1989/zeeburgee-sea-terminal. Found in "City of Spheres" Project Journal, Issue 1 by Emmanuel Petit

21   Greg Lynn, "Architectural Curvalinearity: The Folded, the Plian, and the Supple" in Architectural Design: Folding in Architecture. 1995 & 2004 (revised edition)

Figure 4: Composition of Sphere, Cone, and

Cylinder Parts in The Belvedere

Figure 5: 1:20 Model of The Belvedere

Corbusier's attention to mass as the main perceptual and experiential element.

Each sphere as a constituent part, then, also produces a private interior, occupiable volume and 'balcony'. Here, the sphere is both part and whole, a unique condition between the interior use value of a part and the formal composition of the whole.

PART PROBLEMS / PROBLEM PARTS

Architectural problems, historically, do not directly focus on parts as an area of study. Perhaps it is too ambiguous and therefore concerns often center on things like corners, bricks, plans, translations, and so on in which parts have historically found their subversive way into disciplinary problems through other means. However, concentrating on parts firstly, and generally, rather than merely as a constituent in other problems, we may address a broader range of disciplinary agendas and problems traceable through historic lineages. In so doing, the architectural problem elides elemental and fixed tropes, and instead makes contact with them through a re-framing of the problem or critical issues, such as form. In other words, by considering the mediums, in this case parts, rather than specific elements, an expansive yet still rigorous conversation may be had. And yet, parts are not entirely absent in the canonical problems of architecture. Part-to-whole relationships have been an ongoing discussion and fodder for formal composition since Greek and Roman times. In fact, the Pantheon (127ad) is the composition of a sphere intersecting a cylindrical drum. Only recently, however, has the problem of parts turned away from digital intricacy and graded fields to issues of character, coarseness, and post-digital attitudes. This suggests that now is an appropriate time to re-enlist parts as an architectural problem.

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