

## Growing the Wobbly Dome: Whole Earth Visions and Their Oxymoronic Materializations in the 70s Counterculture Domes

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### Dropped in the desert: *The American southwest exodus and the catastrophic city*

Little can be said about the open communes that spilled over the wild American Southwest at the end of the 60s. "Drop City is not more than a dropping,"<sup>1</sup> claimed its droppers, there is nothing else to it. "It fell out of a window in Kansas five years ago with a mattress and a balloon and landed in a goat pasture neat Trinidad... It is impossible to define Drop City."<sup>2</sup> Sustaining a blur around the commune's purposes, avoiding making any statements was a kind of proactive protest, a constructive negation. Besides, what could be said in the founders' support when looking back, one can hardly overcome the common presumption that a commune was a bizarre grass-root community made by people obviously out of their right minds, wearing weird graphic outfits or nothing at all, smoking marihuana above their unshaved beards and envisioning the universe put differently, looking at the sky still for days. Still, despite the derogative commentary "dirty-hippie-drug-addicted-sex-orgy-crash-pads"<sup>3</sup>, a line of criticism that originated from what the counter culture has defined as the *establishment media*<sup>4</sup>, the urban exodus was quite massive<sup>5</sup>. This was partially due to a novel demographic synthesis across America of a largely growing young population at the inception of the 60s, accentuated by complex socio-political predicaments that posited the city as a catastrophic environment that restrains the imagination and the freedom of the individual.



Fig.1. *Chrono-map* of US communes in the Southwest

All who went commonly agree on the innate obscurity of pinning down a definition for communes. Yet, if one thing can be said about such "perversely ectoplasmic *Zeitgeists*"<sup>6</sup>, it can be asserted that they were "an experiment in living"<sup>7</sup>. In this sense, their space was that of a laboratory, where every effort was made to reinvent habitation and the complex interrelationships between the individual and its milieu. The depiction of the city as a catastrophic place entailed in parallel its own reinvention, the duplication of its complex networks, services and infrastructure in different terms. This living laboratory needed to be a self-sufficient one, an autonomous unity that would be able to sustain itself, cut off from the main urban networks. The shelters of such communities would be able to recycle their waste, produce

and distribute energy and achieve a degree of autonomy in a new equilibrium with nature. It would also produce its own language, a building language, recorded in manuals, which would assume the responsibility of distributing the laboratory's findings.

This utter shift to issues of immediate *survival* -the indulgence into beginning life from zero and creating anew the basic foundations of habitation- was not an uncanny occurrence for Americans. In fact, it transmigrated in an alternated format the eschatological drama of cold war politics and the unreserved fear of survival after a nuclear holocaust. After the second world war, America has for decades lived under the sinister canopy of a double-sided menace, originating both from potential assaults from exterior enemies and from interior governmental agents that initiated a massive inquisition in search for patriotic loyalty<sup>8</sup>. Many critics, who consider cold war politics as the seedbed for the sixties counter culture, support that the eschatological paranoia, latent in the distressed reflex mechanisms of survival that communal shelters embody, has been nurtured in the psychology of a long bearing "world-wide nervous breakdown."<sup>9</sup> Additionally, this aching holocaust trepidation was renewed in the face of an exceedingly alarming environmental crisis, which by the end of the 60s was by no means an ethical concern, but merely an issue of sustaining life against a new omnipotent hazard: pollution. The suffocating air, the dirty water, sudden climatic changes, toxic lands became topics of primary significance, on the basis of distressing ecological incidents that fell out throughout the decade.

Curiously enough, fighting pollution became a unanimous task for all sides that composed the political scenery of the 60s. The politicians, representing the *establishment*, have signed act after act with the scope of protecting the environment, especially since Johnson's administration, which has been patently active on the issue<sup>10</sup>. From the other side, the counter culture, independently of all their disputes with the *establishment* shared similar concerns on the development of a proactive ecological stance. Directly reflecting the suffocating air pollution incidents, Antfarm, in 1972, performed an architectural activist performance entitled "Breathing – That's your Bag", veiled by an idiosyncratic

sense of humor. This was a bizarre convergence from antithetical social streams that led to entirely different sets of actions, yet it should be noted that the concerns sprout from a common point of departure that marked the dawn of the age of ecology as a gallant political and religious position.

Yet despite much evidence to the contrary, the youthful exodus to the Southwest and the initiative to create communities cannot be exclusively interpreted as a deeply disturbed retort instrument to fear. The young generation simply rejected the urban environment and its conventions. Under the assumption that they have the right to start from scratch, they took on a proactive stance and 'dropped out'. Take note that 'dropping' has a double significance. The first meaning is literal, referring to the discontent that urges one to abandon a place or a conventional institution. The second meaning though, which correlated to the common understanding between droppers, adjoins a spatial narration to this previous action; something or someone being dropped from above, like a drip, a driblet or a splotch. The manner in which the droppers envisioned their relocation in abscond lands was similar to a 'drop' from the sky that lands and creates a thin-skinned membrane, an inhabitable environment that does nothing to disturb the ground and the milieu on which it was positioned.

Whatever the principles might have been, the making of communes could not possibly flee the criticism of a *nostalgic* 'return to the land'. It was in fact an utter regression to previous forms of habitation, almost primitive ones. Hand crafting your own shelter, intentionally un-arrogated lands and 'off-the service grid' premises all advocated a primordial drive to reinvent the wheel, which has neither motivated favorable criticism, nor has allowed for looking beyond what could lie beneath the surface of the so-called 'grass-root' movement. As Peter Murray<sup>11</sup> has mentioned regarding the open communes of the Southwest, "these guys took it too far. I visited the Pacific High School in 1972 and it was quite an experience. We<sup>12</sup> believed in the same principles, but the techniques were different. We did not believe that hand crafting could provide any solutions to real world problems."<sup>13</sup>

Evaluating such statements, one can argue that the innate nostalgia of regressing to wilderness and “reinventing civilization,”<sup>14</sup> was an impossible enterprise in regards to the provision of resolutions to the urban impasse, against which it so ardently protested. Assuming that the droppers were quite well aware of such impossibilities, the exodus mostly designated a sincerely sad moment for thousands of young intellectuals who in a dramatic search of a ‘home’ were on the spot ready to live in truncated rhombic-icosahedra. To them, these complex polyhedral structures embodied a more fitting representation of a ‘home’ that was nowhere to be found, precisely as Roszak argues: “A radical discontent and innovation can be found that might transform this disoriented civilization of ours into something a human being can identify as home.”<sup>15</sup> Moreover, one can only question the validity of the claim to live ‘off the grid’<sup>16</sup>, when in fact the functions of the ‘urban establishment’ were duplicated in new independent infrastructure systems and habitats, retaining to a great extent traditional principles of habitation.<sup>17</sup> The shift from the cube to truncated icoso-dodecahedra neither substantiated the pastoral iconography of a romantic return to nature, nor guaranteed any conceptual domestic breakthroughs in terms of the performance or occupation of the habitats. Nature and math were bizarrely very intricately intertwined in the mind of the droppers, bringing to the forefront a crucial question: Is this grass-root direction leading us deeper into the grid?

### **Cooking, Mailing & Calculating; The Radical architecture of the ‘Do-It-Yourself’ Construction Cookbooks**

It is possible that a discussion on the 60s communes begins beyond their inefficiency to provide pragmatic habitation solutions. If one accepts the impossibility of such a task, it becomes evident that the most radical architecture of the 60s communes is not the actual products or shelters, but the architecture of their literary products, the ‘Do-It-Yourself’ Construction Cookbooks. In fact, many communes left behind a quite unexplored genealogy of instruction manuals for the construction of shelter in a perspiring writing endeavor of their processes in their building experiments. The *Dome Cookbook* was the first “Do-it yourself” manual for the erection of domed shelters, opening up a

channel for architectural cookbooks – *Domebook 1 & 2, Shelter, Inflatocookbook, ZomePrimer, Farallones Scrapbook* etc. Throughout the pages of these manuals, architecture was staged as a ‘cooking’ discipline, in a comprehensive set of necessary numerical steps that would spring an end built product. By proclaiming themselves as educational resources and a collective written landscape of gathered and organized information on building, the cookbooks have marked a significant shift from determining final designs to procedural design expressions, techniques of production and construction methods.

The significant contribution that the authors of these manuals have provided us is the scrupulous recording of their processes and the comprehension of their practice as a heuristic device and an accessible piece of knowledge. To write methodically on building and eventually disseminate their manuscripts was a serious undertaking for the groups, who have created their own Californian-based publishing houses, all non-profit corporations, and insisted on disseminating the books almost entirely by mail. As Lloyd Kahn explains,

*“It is much easier to build than to write about it, perhaps that is why so little has been written on building.”<sup>18</sup>*

As a matter of fact, it is supported here that it is precisely the enactment of writing that embodies the most radical architecture of the 60s communes. Writing was by no means a neutral agent of recording a building process that was already predetermined and consequently executed. Instruction manuals, as open source manufacture catalogues, did not only document and narrate a story that needed to be told. They reversely transformed that story; they became themselves architecture. This was mainly due not only to the different selection possibilities, but also the promotion of combinatorial skills, ‘dos and don’ts’ and an evolutionary built-up process that could derail from an original plan or intention.

Overall, the ‘Do-It-Yourself’ Construction Cookbooks have been criticized and classified under a ‘grass-root generic umbrella. To a certain extent, this characterization is fair,

given the fact that the later manuals zealously preached a resistance to the menace of

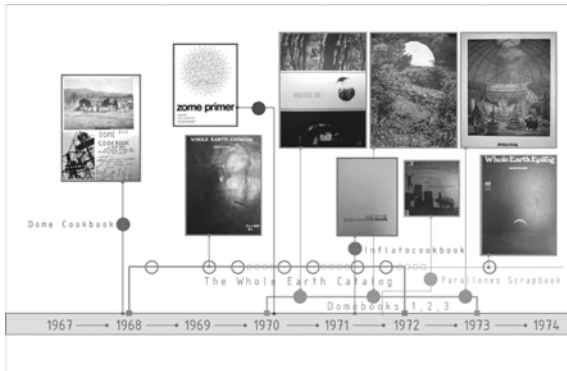


Fig.2. Timeline for the 'Do-It-Yourself' Construction Cookbooks

technology and the primordial, familiar 'return to nature'. Still there is a paradox in this whole schema. Even though, the droppers stressfully laid claim to an utter technological denial, the architecture of the manuals relates remarkably to the way the design praxis has been recently redefined or updated through the use of digital media. This observation has nothing to do with the form of contemporary projects and the domed structures that were produced by the communes; but marks a conceptual shift intricately intertwined in the process of the design praxis from the object of 'parthenic' inspiration to open procedural thinking. Essentially both approaches advocate against the design monotheism of singular solutions. They latently allege that design is an open source code that can derail to many different destinations on the basis of minor choices that are taken along the way, none of which are spectacularly significant on their own. In fact, the architecture of the manuals could be described as an analogue structure to the rule based systems and stirring variability induced by the use of programming languages and advanced computation tools in contemporary digital design methodologies.

Prodding deeper, there is a tripartite rationalization to this assertion of correlations. First, all the 'Do-It-Yourself' Construction Cookbooks have stressed the majestic implication of mathematics in the design of shelter. As a matter of fact, the droppers affirmed that they did not even design any

plans for their domes, but instead claimed: "Our blueprints have been mathematics."<sup>19</sup>

Second, all the 'Do-It-Yourself' Construction Cookbooks shed emphasis on the awakening of procedural thinking, which accordingly necessitated a new analytical language that would blatantly communicate construction. Conventional blueprints were forgone and by and large replaced by lists in numerical instruction-like steps, similar to a catalog; except for the fact that the enlisted information attained generative functions, in the sense that it could bring out multiple, variable products. Certain shelters and sheds, built during later stages of habitat production (70s) exemplify rare construction ingenuity, which is precisely the result of constrained reiterations of simple rules in mettlesome combinations. No manual editor claimed that the analytical breakdown was written in an exact order that needed to be retained at all costs. In fact they antithetically declared that the reader should mess up with the system that has been provided to him. In essence, all that was provided was a database that straightaway initiated a building process and relieved the user from the bewildering vortex of conceptual brainwave.

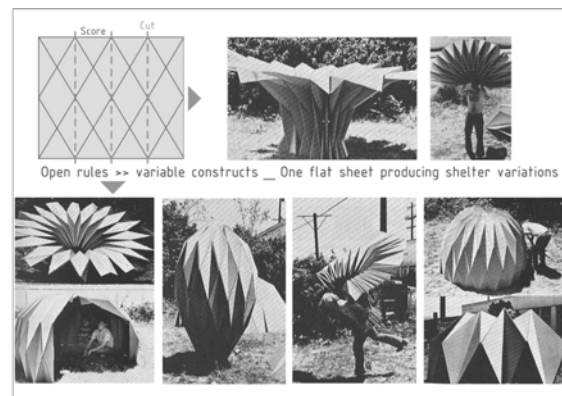


Fig.3. Variable paper shelter in the *Farallones Scrapbook*

Third, the way in which the magazines circulated was not accidental. All 'Do-It-Yourself' Construction Cookbooks were not being randomly distributed in bookstores, but utilized the existing infrastructure of the post as an agent to create an alternative secondary publishing network that anyone could log into. The connections with the Internet are overt, as in the case of the *Whole Earth Catalog* that has functioned consistently as a publication

core for the distribution of the manuals and set out an orchestrated allocation strategy that the rest of the manuals adopted, conceiving themselves as a group. As a matter of fact they were committed to forming a secondary circulation network, grounded on the niches of the time's consumerism and conceptualized as a web superimposed on the primary circulation network.

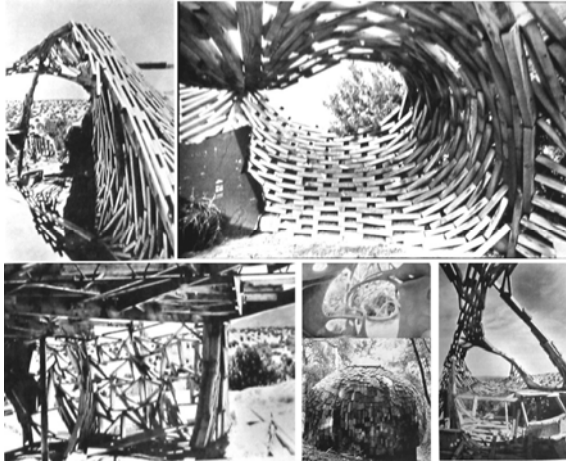


Fig.4. Barns, shelters and sheds in *Shelter*, which included *Domebook 3*

### ***Growing the Wobbly Dome; Junk, Math and animals***

If we now turn to the actual construction process of communal domes, the emphatic interest on growth and transformation reenters into the conversation as a remnant of the manuals' procedural operations. In fact, the term 'construction' was somehow depleted and replaced by the term *growth*, which signified an instable assembly process. To understand this subtle shift, we address a characteristic quote by Steve Baer on his early dome erections at 'Lama Foundation'. Baer, in his struggle to fit curved car-top panels -cut out from defunct automobiles- onto perfect mathematically derived zonohedra,<sup>20</sup> traces the wonder of his undertaking in the *wobbly* nature of the dome he finally created. In fact, these two things would not naturally conform to each other and it is in the fuzziness of such a system that Baer invested in.

"Building the cluster of domes at Drop City was also very instructive in that they became rigid step by step... It is necessary to separate the changes structures undergo as the panels are fastened in place and

those that occur when the structure is complete but fasteners and braces are still being added. The *growth* of a dome panel by panel is a marvel, watching it take its shape and strength is something at once very strange and very familiar because it seems alive. But this process if it ends on the addition of the last panel in a rock solid dome does not reveal what was unnecessary in the construction of the panels or the way in which they are connected. If rigidity were to come before the addition of the last panel it may show that you have *overbuilt the dome*, but this is an unlikely occurrence."<sup>21</sup>

*Junk and Math* or in other words cladding geodesic type domes with raw stuff -found material in junkyards- are seemingly either disjunctive or irrelevant parameters, however within the framework of the 70s counterculture they embodied the two key ideological components that needed to be incorporated in dome production. Bizarrely enough, the oxymoron schema of their unsophisticated synthesis, which has conducted to an instable way of construction (as nothing would fit together), uncovered the crucial lead of 'growing' rather than 'constructing.' Via instability, construction attained evolutionary features, reifying all the vital naturalistic metaphors that were of dramatic significance.

To begin with math, the most immediate influence on building mathematically defined domed structures, was the work of Buckminster Fuller on geodesic domes, which has been more than influential. It was closer to a muse and an inexorable inspiration resource that all manuals candidly copied and referred to with zeal. Just to get some basic terms on the table, a geodesic in mathematics, is the translation of the notion of a straight line to curved surfaces, that defines the shortest path between points on a surface as segments of whole circles.<sup>22</sup> The term originates from the Greek word *geodesy* (*γαιωδεσία* > *γη-δένω*), which means binding the earth and actually refers to the science of measuring the size and shape of the earth with the shortest possible routes. Etymology in this case helps retrieve the implications of the earth within the process of dome building and imbue within the mathematics of construction other layers of meaning that exceed coarse technical issues. Consequently, the utter counterculture bias in favor of 'roundness' was in direct correlation with the

omnipotent imagery of the globe icon that has been released to the public eye only in the late 60s and marked the previous limits of human imagination. The globe immediately credited to the shape of the sphere unprecedented symbolic mystic and mythic significance. It is then no accident that domes have almost exclusively been graphically presented in a circular format, which alluded to higher forms of holistic awareness.



Fig.5. Domes in the *Pacific High School* (Palo Alto California), illustrated in *Domebook 1*.

As one can witness from the experiences of the Pacific High School dwellers,

“The dome is interesting not only aesthetically or mathematically, but also philosophically and spiritually... The dome is expressive of our new approach to the universe. It is in harmony with the scientific concept that space itself is curved. In its roundness it represents our modern desire for continuous mental expansion, for reaching out to the universe instead of boxing ourselves in protectively against its immensity. The dome seems in some way to be more conducive to the mental and spiritual harmony of the dome dweller, perhaps because its more natural shape helps to attune him with nature instead of alienating him from it. Boxed houses belonged to an age when men stood in opposition to the world around them, in competition, as it were, with nature and the universe. Domed houses belong better to this age of growing awareness of man’s need to cooperate with nature of he is to progress further, or even to survive the destructive forces that his cooperative spirit has unleashed.”<sup>23</sup>

In light of this evidence, the ‘anti-boxing’ fixation against four-cornered spaces, which were assumed to drastically restrain the mental plasticity inherent in creativity, speaks firstly of the inadequacy of the box itself, but also of an inefficient strategy of description for any kind of geometry. Twelve straight acmes in Euclidian relations were, for the droppers, somewhat in short supply to respond to the multivalent, radical expansion of complex urban infrastructure systems, including communication networks and other services. Ultimately, the cube has authoritatively been considered as that geometric element to usurp control in the design of the habitat, but was assumed to have reached its definitive impasse. Baer’s statement in the *Dome Cookbook*, summarizes in a nutshell this fervent anti-cubical irritation: “The cube! What about the cube? Is the cube as they say dead or is it instead another type of life form that with its characteristic rectilinear grid is slowly taking over the planet like some *galactic impetigo*?”<sup>24</sup>

If communal experiments copied geodesic geometry, like every theft in design practices, the object under scrutiny was transformed and mutated as it was being executed. In the end, they delivered a new geodesic vision, which only crudely embodied the pure scientific aspect of mathematics, but instead has enhanced it in a cult dimension. The dome beyond a material artifact and the specifics of its own geometry was a mediator between the macroscopic scale of the globe and the microscopic scale of the cell and the crystal, all rounded elements that exist simultaneously in multiple scales and in one way or another secure the function of living systems. Between zooming in and zooming out<sup>25</sup>, the droppers’ great expectation was to find the same information in different scales and it would be precisely the crossing of zones that would contribute to the reinvention of the habitat. As Voyd claims, “To live in a dome is – psychologically- to be in closer harmony with natural structure. Macrocosm and microcosm are recreated, both the celestial sphere and molecular and crystalline forms.”<sup>26</sup> Negotiating these two spheres, the dome, more than a physical artifact, was itself a representation of curved space;<sup>27</sup> a symbolic surface on which different perspectives converged on a thin membrane, yet thick in its inter-scalar connotations.

Of course the reliance on mathematics to unveil some universal truth was no striking news for the time and can be traced on the tradition that Wittkower and later Le Corbusier<sup>28</sup> had vigorously set out. What is depleted from the picture though in the case of the droppers' domes is the majestic significance of proportions. In the communes we are investigating, proportions become somehow irrelevant or even impossible as the whole process of putting a dome together, is constantly being redefined through the addition of garbage materials. The byproducts of consumer society absolutely embodied a philosophy for social reform and a proactive protest against profligate consumerism<sup>29</sup>, but they were also unexplored building materials, formally and texturally replete with potential. According to the garbage doctrine, each dropper would need to become a scavenger; a ruthless collector of miscellaneous found objects, where each component would contribute with its own texture, form and particularity to the overall construction of a dome. What is important to retain here is not just the peculiar canon of garbage reuse, but the upshots of a sustained ideology in an architecture that was so hard to grasp that could most appropriately be called as a piece of environmental sculpture.<sup>30</sup> It was precisely this uncanny interaction between the existing dome frame and the unsuitable for its designated parts, assorted components that enhanced the sculptural aspect of building and evoked the awe of fellow travelers. It was this fuzziness that fundamentally destabilized Fuller's original geodesic vision. The math got dirty, the geodesy corrupted; the dome became *wobbly*. And eventually wobbliness, as the physical instability of the dome, was a welcomed building malfunction. Remember Baer's words on how the resistance of the dome that would *grow* instead of being executed was a marvel.<sup>31</sup> Via resistance, the dome was developing its own life; an animate behavior.

This observation can be easily traced in a recurrent biological terminology recorded in the manuals. Terms such as skin, web and membrane, directly migrating from the life sciences, were metaphorically used here to describe the structure of domes. Going further, out of the range of such scientific crossbreedings, it is important to distinguish the natural metaphors attached to this specific kind of dome building between the ones that

simulate a passive life, growth and metabolism, and the ones that this life attains an unforeseeable will and derailing behavior. Among droppers, it was believed fervently that domes were not just imitating life but had one of their own, according to the doctrine that "spiritual reality is physical reality clearly seen."<sup>32</sup> In a discussion on the Southwest dome building, Murray mentioned how droppers repeatedly used the word 'vibe,'<sup>33</sup> it representing not only an ethereal aura that has no physical effect on its milieu, but it affecting its environment. For instance, the 'bad vibe dome' in Pacific High School, which was sprayed with plastic foam, released harmful gases with unpleasant olfactory sensations.<sup>34</sup> Observe how this assertion awaits the concrete materialization of an intangible, spiritual condition to physiological substances.

Did the dome have a good vibe?

If so, it would adapt harmonically to its environment, if not so it could be consumed by it or reversely injure it, fusing degenerate foam gas.

Did the dome have a good vibe?

If so, it would protect its dweller, if not so it could seriously disturb his peaceful 'becuz.'<sup>35</sup>

Every single one of the 'Do-It-Yourself' Construction Cookbooks dedicates at least an expansive section on sealing, which includes beyond technical advice on how to construct insular seams, written memoirs on the ramifications the dwellers had to face because of insulation quandaries. More than verbal descriptions, in a few cases, there are still sketches that portray the dome as an animate creature turning against its builders and letting them soak in weeping misery. By all means, this extreme leakage abhorrence was beyond technical and this not hard to understand, given the fact that the droppers inhabited their own constructs. It is only natural that they developed an abnormal attachment with their structures, since their personal investment in them was, for construction standards, unprecedented. Their struggle was constant and perspiring and as Khan notes in *Domebook 2*, they worked in a state of emergency.<sup>36</sup> "IF YOU WON'T LIVE IN IT – DON'T DESIGN IT,"<sup>37</sup> stated a capital letter counterculture advertisement in the

California Freestone Conference in 1970. Speaking for the majority of garbage domed communes, if one were to speak of them as a movement; it would be one of the most phantical architectural movements of the twentieth century.

To end the story somewhere here, the desert was itself a wasteland, a nothing land that sheltered the most antithetical tenants: communal experiments and atomic weapons, laboratories, or in general the infrastructure that sustained the cold war. In short, the communes' neighbors were precisely these structures that personified the apotheosis of the catastrophic functions of the *establishment* and moreover the very reasons that caused the massive anti-urban exodus in the first place. "The country's most primitive terrain was suddenly host to its most sophisticated technology,"<sup>38</sup> as well as its alleged utter denial, paraphrasing Vanderbilt's remark. By hosting these repulsive fellow guests, the land has gained temporarily a function. An expanding vagrant land that has tuend its conctructs into ruins and later incorporated them into its aggregate collective body of urban waste functions, eating or devouring what was so carefully cooked.

## Endnotes

<sup>1</sup> Peter Rabbit, *Drop City* (New York, NY: The Olympia Press, Inc., 1971), p.26.

<sup>2</sup> Ibid.

<sup>3</sup> Richard Fairfield, *Communes USA. A Personal Tour* (Baltimore, MA: Penguin Books, 1972), p.2.

<sup>4</sup> For the counterculture, the *establishment* was a characterization that summed up a generic abhorrence for the remnants of cold war politics and the inquisitive functions of the government: McCarthyism, the FBI, the CIA and the Organization Man. The *establishment* was also widely used as an expression to signify conservative parental guidance, which appalled the youthful generation of the counter culture. This word is used by most authors who write on the counterculture, such as Terry H. Anderson in *The Sixties* (New York, NY: Pearson Longman, 1999) and Richard Fairfield in *Communes USA. A Personal Tour* (Baltimore, MA: Penguin Books, 1972). Fairfield defines the *establishment media* as the magazines that are controlled by and promote the interests of the *establishment*.

<sup>5</sup> Richard Fairfield in *Communes USA. A Personal Tour* mentions that in 1972 there were over 2,000 communes across America (p.5). There was also a pamphlet on obtaining the necessary skills in order to found your own commune -*How to make a commune*, a pamphlet published in January 1971 by Alternatives Foundation, PO Drawer A, Diamond Heights Station, San Fransisco, California, 94131. The *Alternatives Foundation* was a pioneering agent in the establishment of communes and the counter culture.

<sup>6</sup> Theodore Roszak, *The making of a counter culture; reflections on the technocratic society and its youthful opposition* (Garden City, N.Y: Doubleday, 1969), p.xi.

<sup>7</sup> Emil Hoffmann (Ed), *The Supplement* (Santa Fe, New Mexico: Monthly magazine: 1969).

<sup>8</sup> The massive inquisition took place in the framework of the *anticommunist crusade*. "Critics labeled it the *witch-hunt*. During the Truman administration the FBI conducted 25,000 full-scale investigations, but that was a fraction when compared to the number conducted by all state and federal agencies during those years: 6.5 million citizens were checked for loyalty".... "In March 1947 Truman announced his strategy to combat domestic communism: *the loyalty program*. By executive order the president established procedures to investigate federal employees and dismiss them if the government believed there were "reasonable grounds for belief in disloyalty". Those reasons naturally included treason and espionage, but also affiliation with any so-called subversive organization. By 1951 the administration expanded the program, so one could be fired if there was "reasonable doubt" of loyalty, and later employees could be dismissed if their behavior was not "reliable or trustworthy", which led to attacks against anything unusual for the time." In Terry H. Anderson, *The Sixties* (New York, NY: Pearson Longman, 1999), p.3-11.

<sup>9</sup> This expression is excerpted from journalists Joseph and Steward Alsop, who predicted "constant aching mounting fear" and a "world-wide nervous breakdown", speaking of the atomic future. In Terry H. Anderson, *The Sixties*, p.3-11.

<sup>10</sup> L.B. Johnson signed the Air Quality Act of 1967 immediately after the 1966 Thanksgiving event in New York. The act "basically allowed the federal government to fix national standards for industrial air pollution and resulted in unleaded gasoline – and much cleaner air." But even prior to that, Johnson's administration was rigorously proactive in many environmental issues. He established "46 new federal areas, including the first new national parks in a generation – Canyonlands in Utah, Redwoods in California, North Cascades in Washington... The



administration also confronted pollution, and Democratic senator Edmund Muskie of Maine, who became known as 'Mr. Clean', led that campaign". In Terry H. Anderson, *The Sixties*, pp.67-70.

<sup>11</sup> Peter Murray was an art director and consequently Technical Editor of *Architectural Design* magazine during the years of 1968 to 1973. *AD* and certain communities of the Southwest maintained a close collaboration, since *AD* functioned one of the main distributors of the manuals that they have produced. Peter Murray traveled to the San Francisco Bay area in 1972 for the purposes of the magazine.

<sup>12</sup> "We" in this phrase was referring to the English, and reflects the scientific outlook of *AD* magazine during Murray's years.

<sup>13</sup> This quote is excerpted from a personal interview with Peter Murray in his office in London, on November 25<sup>th</sup>, 2005.

<sup>14</sup> Stewart Brand's observation in Bill Chaitkin, "Counter-Culture," *Architectural Design*, p.221.

<sup>15</sup> Theodore Roszak, *The making of a counter culture; reflections on the technocratic society and its youthful opposition* (Garden City, N.Y: Doubleday, 1969), p.xiii.

<sup>16</sup> 'Living off the grid' was the basic premise of the vast majority of communal living experiments. Later, in the mid 70s this direction was taxonomized under the generic umbrella of "Autonomous Houses". As we can see from the "Autonomy's" description in the manual for "Radical Technologies", "These dwellings would be independent of grid services. Some services (waste management, some food, space and water heating) would be provided at the household level, others (electricity, water, cooking gas, some food) at the community level, where economies of scale make shared facilities cheaper."

In Peter Harper, Godfrey Boyle & the editors of the Undercurrents (Eds), *Radical Technology* (New York: Pantheon Books, A Division of Random House Inc., 1976), p.132.

<sup>17</sup> For example, Chaitkin notes that "the mythologies of the freestanding dwelling and free land are rooted in the romanticism of American anti-urbanism." In "Counter-Culture," *Architectural Design*, p.220.

<sup>18</sup> Kahn (Ed), *Domebook 2*, p.13.

<sup>19</sup> Lloyd Kahn (Ed), *Domebook 2*, p.13.

<sup>20</sup> A 'zonohedron' is a three-dimensional dome structure made exclusively of zonagons, which represent a class of polygons where each side has another side parallel to it.

<sup>21</sup> Baer, *Dome Cookbook*, p.24.

<sup>22</sup> Wikipedia, The Online free encyclopedia.

<sup>23</sup> Note by Swami Kriyananda in Lloyd Kahn (Ed), *Domebook 2*, (Bolin, CA: Shelter Publications, a non-profit educational corporation, 1971), p.96.

<sup>24</sup> Lloyd Kahn (Ed), *Domebook 1*, (Bolin, CA: Shelter Publications, a non-profit educational corporation: 1970), p.1.

<sup>25</sup> The mystic connotations of 'zooming in and out,' expecting to find similar arrays of information, was not primarily an architectural concern but mostly a global one, especially as it was related to an arousing awareness towards the environment. The globe icon, which eventually became the undeniable symbol of environmental concerns, was fetishized as a symbol and used as a representative image in almost all essays on the environment. In the January 1970 issue of *Newsweek* featuring the "Ravaged Environment", the globe icon took over the cover of the magazine, while the issue of 'zooming in and out' was clearly expressed as an environmental issue, which essentially claimed that the micro conditions needed to respond to the utopic graphic symbol of the earth zoomed out. Otherwise there is a viewing discrepancy as different perspectives reveal different realities. "Seen from the black depths of space, the earth is a lovely blue and white stippled island in the archipelago of planets. It is unique, with its surface wetted by water cushioned by greenery and fanned by air. Close up, the earth -and particularly that part of the land mass occupied by the United States- presents a far different picture. For example, fishermen in Colorado cast for trout among the beer cans, and debris falling into the Eagle River from an open dump on the bank; American women carry in their breasts milk that has anywhere from three to ten times more of the pesticide DDT than the Federal Government allows in dairy milk meant for human consumption; the Cuyahoga River in Ohio is so overrun with volatile industrial discharges that last summer it caught fire and burnt two railroad trestles. Such is the home of the most technically advanced population on earth."

In Gwynne, "From Sea to Shining Sea," *Newsweek* (1970), p.36.

<sup>26</sup> Bill Voyd, "Funk Architecture" in Paul Oliver (Ed), *Shelter and Society*.

<sup>27</sup> For the droppers, *curved space*, as an incision to Euclidian geometry, was also a state of mind with inherent plasticity that triggers creativity. The droppers claimed: "Everything that man does is, in a sense, a statement of his outlook on life. A stiff mind will generally be attracted to straight, not to curved, lines. A materialistic person, attached as he is to solid matter, will be inclined to construct firm, heavy buildings - reflections of his own vision of a world that will endure forever. Insular people, fancying reality to be no larger than their own definitions of it, like their homes, too, to box them in cosily, shutting out from their minds the vast universe outside." In Kahn, *Domebook 2*.

<sup>28</sup> Mathematics as a tool to uncover universal truths is nearly paraphrasing Le Corbusier's own terms in the *Modulor*. He specifically claims the following: "Mathematics is the majestic structure conceived by man to grant him comprehension of the universe."

In Le Corbusier, *The modulor; a harmonious measure to the human scale universally applicable to architecture and mechanics* (translated by Peter de Francia and Anna Bostock), (Cambridge: Harvard University Press, 1954): 71.

<sup>29</sup> See the first chapter on how the cities were suffocating in terms of air pollution and of piled junk in alarming proximity. The following quote was featured in large, bold letters in Newsweek magazine: "Too many people living too close together pile high the earth with worn-out junk and trash." In Gwynne, "From Sea to Shining Sea" in *Newsweek* (January, 1970), p.37.

<sup>30</sup> This is the expression of Bill Voyd in his essay "Funk Architecture". In Paul Oliver (Ed), *Shelter and Society* (New York: F. A. Praeger, 1969).

<sup>31</sup> Baer, *Dome Cookbook*, p.24. Baer kept referring how it necessitated a perspiring effort to accommodate the cartops on the domes, since they were mostly car-tops that were manufactured as double curved surfaces and when they were applied on the dome, it affected its whole center of gravity. Eventually, he was captivated by this resistance, which he explains in the following quote on page 22: "The tops are compound curves (curved two ways at once like a sphere) so I measured the sides of the triangles along the curves. When they were cut out they weren't flat, but when the flanges were bent in on a sheet metal break, all the distances flattened out!... However, even after this is done, the dome may be springy to walk on."

<sup>32</sup> Voyd, "Funk Architecture" in Oliver, *Shelter and Society*.

<sup>33</sup> Besides oral testimonies, we have also written ones. See for instance *Street Farmer* (No.1 & No.2),

(London, UK: Architectural Association Student Journal: 1971-1972). The word 'vibe' is widely used and the place where the magazine was printed in London is declared as the "good vibes corner": The editors write, "This issue was printed by Guys and Sarah at IRAT printers 13 Prince of Wales Cres. (Good vibes corner). See also Durkee, "Lama Foundation Commune," *Architectural Design*, (1971), p.747. He mentions: "Soon one of us would be hanging out /in picking up on the vibes."

<sup>34</sup> This quote is excerpted from a personal interview with Peter Murray in his office in London, on November 25<sup>th</sup>, 2005.

<sup>35</sup> 'Becuz' was another favorite word for the droppers. It was an invented word, first used by Steve Durkee in his AD article for the Lama Foundation. Etymologically it paraphrases the word 'cuz' which derives from 'coz' >'cozen' (cousin) and refers to kinship, or family relationship of cousins. We can assume that it was Durkee who invented this word, since he was so inclined to 'titlemania'. Remember that Durkee invented the word 'zome' for Baer. Durkee wrote: 'becuz'- "a new word we don't even know exactly what it means; yet it describes people in relationship involved in process creating life together... to grow together with that mysterious process & come to know life in all of its forms." In Durkee, "Lama Foundation Commune," *Architectural Design*, (December, 1971), p.751.

<sup>36</sup> Kahn, *Domebook 2*.

<sup>37</sup> "Advertisements for a counter culture" in *Progressive architecture* (July 1970) Vol. 51, pp. 71-93.

<sup>38</sup> Tom Vanderbilt, *Survival City: Adventures Among the Ruins of Atomic America* (New York, NY: Princeton Architectural Press, 2002), p.25.