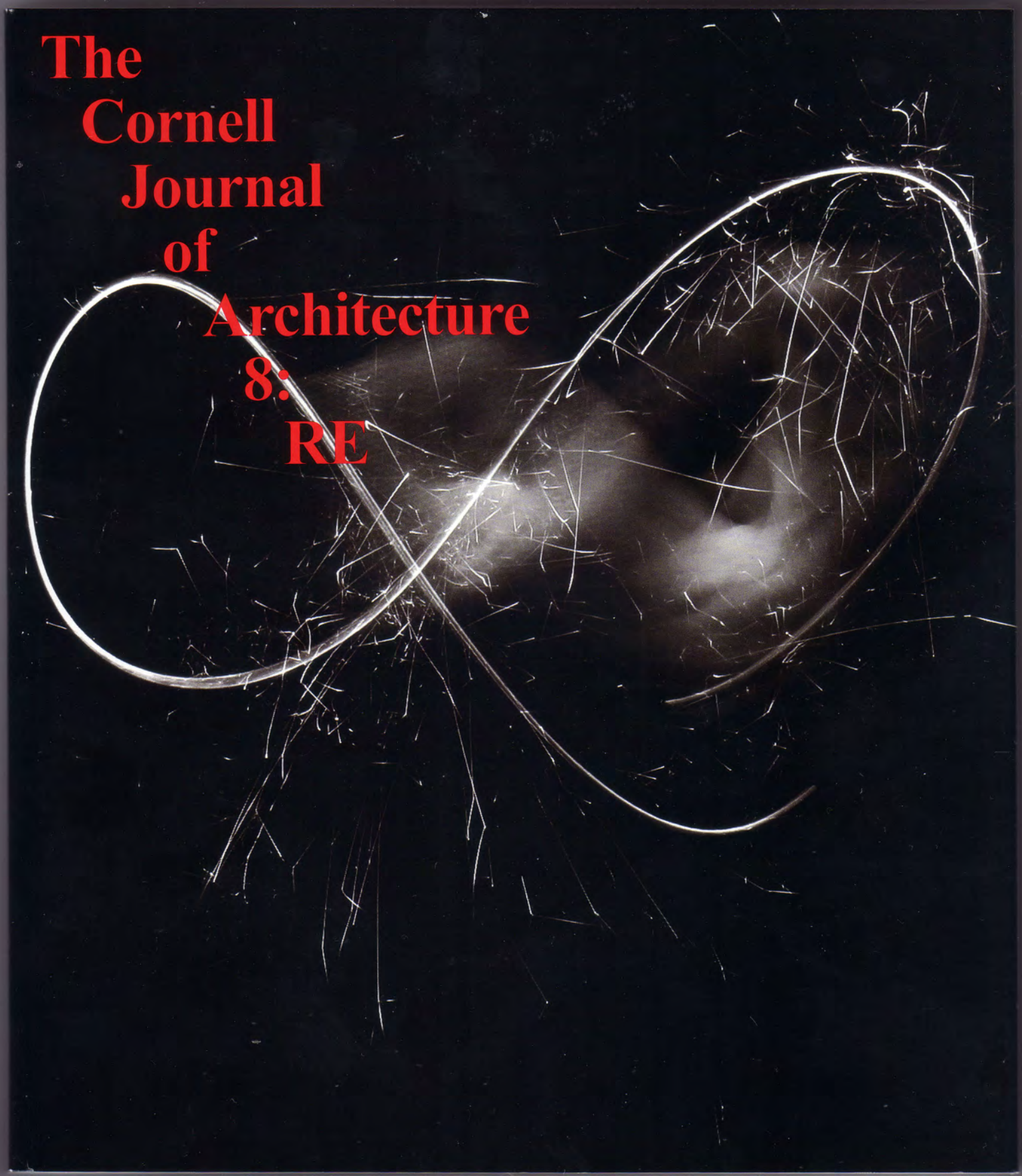
The Cornell Journal of Architecture 8: RE



Dear Jason and Aleksandr,

The United States produces approximately 250 million tons of garbage each year, of which 83 million tons is recycled or composted, equivalent to a 33.2 percent recycling rate, a figure that has been rising since the 1960s.[1] *But there is another kind of waste produced that is much harder to quantify and to recycle. Physical manifestations of this less tangible refuse can be found locally in the cities of the Rust Belt and among the networks of canals throughout New York State. Embedded within these fossils, there exist whole bodies of knowledge connected to those superseded modes of production and obsolete infrastructures. As technology and interests shift, and we realize that certain systems are outdated, irrelevant, and insufficient: that knowledge is at risk of being lost.*

Can you describe how we might recycle, in addition to our trash, some of this intellectual waste, and what the consequences of this might be on the physical realm?

—Eds.

Austin + Mergold

is an architecture, landscape, and design practice based in Philadelphia. A+M is engaged in a wide range of work with a special interest for re-interpretation of the local vernacular. Jason Austin is also an adjunct professor at University of Pennsylvania, Department of Landscape Architecture and Temple University, Department of Architecture. Aleksandr Mergold is a visiting assistant professor at Cornell University Department of Architecture.

Yes We Can

Some Musings on Canning and Infrastructural Metamorphoses

> *Cannery Row is a poem, a stink, a grating noise, a quality of light, a tone, a habit, a nostalgia, a dream. Cannery Row is the gathered and scattered, tin and iron and rust and splintered wood, chipped pavement and weedy lots and junk heaps, sardine canneries of corrugated iron, honky tonks, restaurants and whore houses, and little crowded groceries, and laboratories and flop-houses. Its inhabitants are, as the man once said, 'whores, pimps, gamblers and sons of bitches,' by which he meant Everybody. Had the man looked through another peephole he might have said, 'Saints and angels and martyrs and holy men,' and he would have meant the same thing.*
>
> John Steinbeck, *Cannery Row*, 1945

The term *infrastructure* did not appear in everyday conversation in the United States until the mid-1950s.[2] Until then, the word had been primarily used by French military engineers. It was by way of World War I that this French military jargon infiltrated the allied vocabulary, eventually entering the English vernacular as a term indicating that which provides the means to support our way of living. Today, along with energy distribution, transportation networks, and water/sewerage systems, the term also encompasses other basic service provisions—from garbage collection and policing to public libraries and schools. It is possible to argue that infrastructure is not only responsible for our *well-being*—on a purely elemental level—but rather also for our *well-living:* including not only support of life in a physiological sense, but also in terms of culture, society, and civility.

Food growth, processing, packaging, and distribution comprise a fitting example of this development of infrastructure and its eventual evolution into "infra-culture." For while food, in principle, provides daily nourishment to individuals, food also, particularly the kind that has been specially treated to keep for a prolonged period of time, has enabled geographical exploration, trade, and war for the last several hundred years. The production of processed preserved foodstuff became highly industrialized at the end of 19th century and, by the end of World War II, had spawned a vast infrastructure of its own, spanning the original producers, preservers, the industry and science behind it, as well as delivery, advertising, and distribution systems.

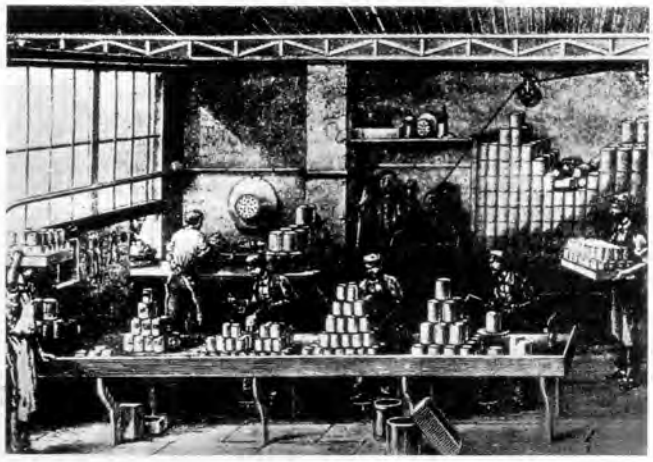
But by the second half of the 20th century and now into the 21st, canned food, at least as a concept, has transformed from its original premise of basic

sustenance into a cultural icon, a cultural pariah, and any combination of the above.[3] Furthermore, the idea of "canning" has transcended its original 1:1 scale. Large manifestation of the "can" containing grain, equipment, livestock, even people—Butler buildings, Quonset huts, grain silos, along with their famous derivative, the Dymaxion House, and the promise of quickly assembled prefabricated dwellings—are also part of our present physical or cultural milieu. These metamorphoses of a simple tin canister testify that we might be witnessing a transformation of infrastructure from its original "nuts and bolts" premise into a much more complex system encompassing human ecology, culture, convention, ritual, taste, and habit. Can this process, guided by exterior forces of human development, be controlled, or at least mined for its productive side-effects; and would we, the architects, as professionals particularly skilled at navigating this metamorphic "infraculture," be the ones to do it? We think yes, yes we can.

Can, the Original

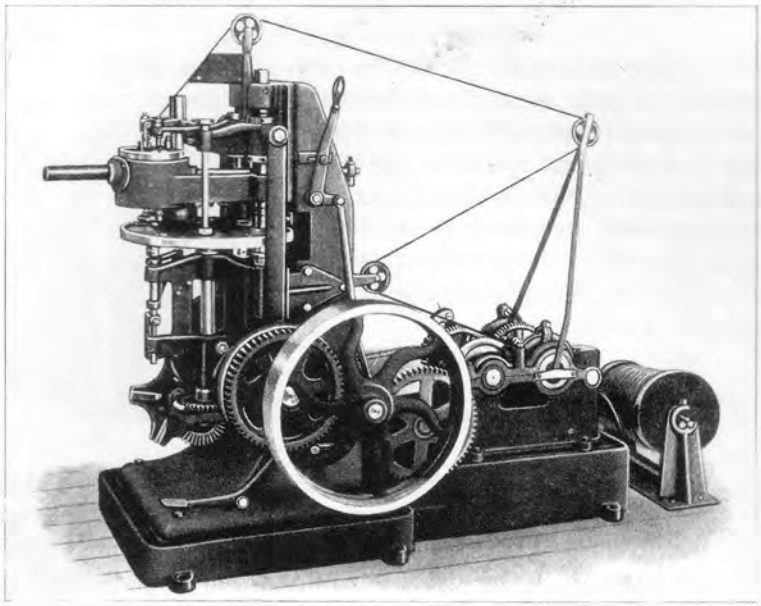
Canning, like the term *infrastructure* itself, is also a French invention, again very much related to military history. In 1802, Nicholas Appert answered the call of the French government to invent a method of long-term food preservation suitable for supplying the troops engaged in the multiple wars of the young republic. Napoleon Bonaparte himself issued a reward of 12,000 francs for the processes originally called "appertizing."[4] The process is largely unchanged today—prepared food, vegetables or meats, are briefly heated before being tightly sealed into a container. Appert himself was not quite able to explain the science behind his invention, and it was only by virtue of another Frenchman, Louis Pasteur, that the role of microbes and bacteria living in our food was understood.

The real breakthrough that allowed canning to become a serious industry, giving the whole process its modern name, was the invention of the sealed, corrugated, double-seamed tin. The appearance of this container sometime in the late 1880s enabled the exploration of the most remote corners of the world, the proliferation of colonial empires, the subsequent waging of the two world wars over those colonies, as well as the Cold War, and the Moon walk.



Neverslip
Solder

The Solder
that
Does Things



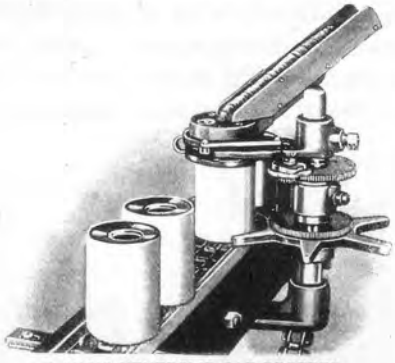
Steel
Can Capper

A Sure Seal
Guaranteed

LANG'S AUTOMATIC NEVERSLIP HEMMED CAP MACHINE

Lang's Neverslip Solder—
The product of Orignal distinction. Just a little bit better than other

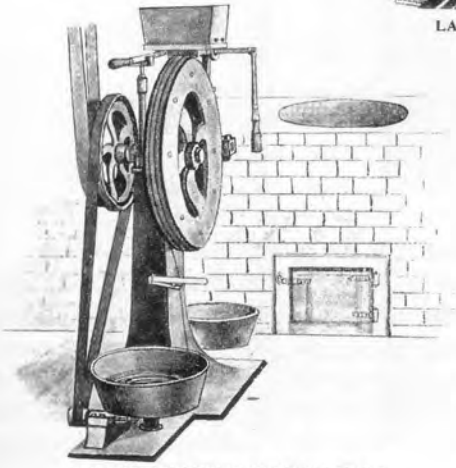
WIRE SOLDERS



LANG'S NEVERSLIP CAP DROPPER

Buy Lang's products and stretch the earning capacity of every

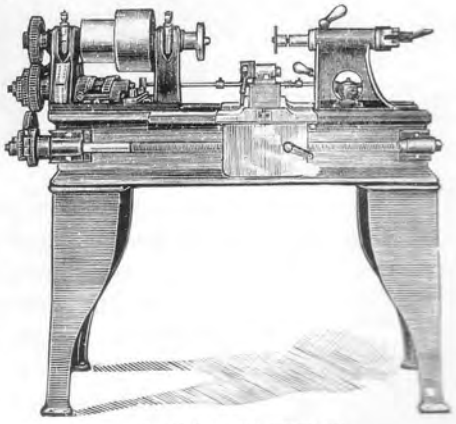
DOLLAR INVESTED



LANG'S NEVERSLIP WIRE MACHINE

The man who figures factory costs and NEVERSLIPS Recommends Lang's Products

Exhibit Space No. 164
BALTIMORE
CONVENTION



LANG'S WIRE SPOOLER

E. M. LANG COMPANY, Portland, Maine

While it is not clear who is solely responsible for the "tin canister,"[5] this simple device provided numerous benefits: it could be produced cheaply and its contents could be preserved longer, its shape and materiality reduced shipping weight and cost, making storing/stacking a more efficient operation. The United States itself owes its initials, the *U.S.,* and its namesake Uncle Sam, to a certain Samuel Wilson of Troy, NY—a meat-packer and canner, supplier to the American army during the War of 1812. Wilson's packaging was stamped with capital letters *U* and *S,* and soldiers called the produce Uncle Sam's. Wilson also looked the part, according to his photo. In 1959, Congress made it official.

Can Transform(ed)

World War II transformed the canning industry into a highly efficient system of farming, canning plants, metal fabricators, machine shops, and delivery services in order to supply the troops overseas. At this time, the military also started experimenting with canning things other than prepared food—first on a small, and then on a much larger scale. In 1943, the U.S. Navy started shipping clothing, ammunition, and engines in large sealed tin containers in order to minimize exposure to elements and better preserve the contents. At the same time, Buckminster Fuller was commissioned to design an easily deployable housing unit, based on his original experiments on the Butler grain bin. The result was two built prototypes of the Dymaxion House. Neither ever entered production—the war, by then, was over.

Yet the original metal grain bin, patented in the 1900s, is still a persistent landmark in most rural areas of the United States. New, prefabricated metal grain bins are still available from catalogs at relatively low prices in a variety of diameters and heights, complete with engineer's drawings and step-by-step assembly instructions that will yield a complete and sound structure in a matter of days (if not hours).[6] The horizontally oriented "halved" version of the grain bin, known as the Quonset Hut, has been in development since World War I and became widespread during World War II, housing ammunitions, supplies, and troops themselves. Today, the Quonset hut is no longer in production,[7] but the few that remain have attained a cult status.

(No Model.)

E. R. PRUITT.

CANNING MACHINERY.

No. 512,323. Patented Jan. 9, 1894.

Fig. 1.

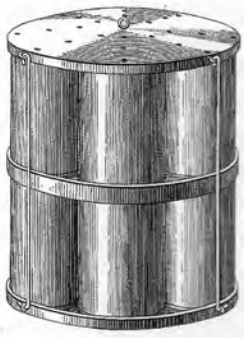


Fig. 3.

Fig. 2.

Witnesses:
Harry D. Asher
M. Pughsley

Inventor:
Eugene R. Pruitt
By Knebel & Knebel
Atty.

H. G. HARRISON.

GRAIN TANK.

APPLICATION FILED APR. 11, 1916.

1,242,935. Patented Oct. 16, 1917.

2 SHEETS—SHEET 1.

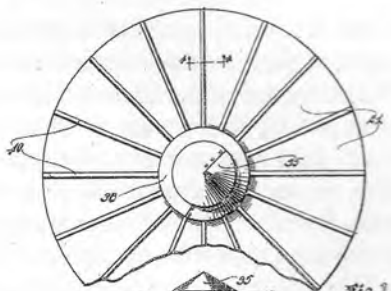


Fig. 1.

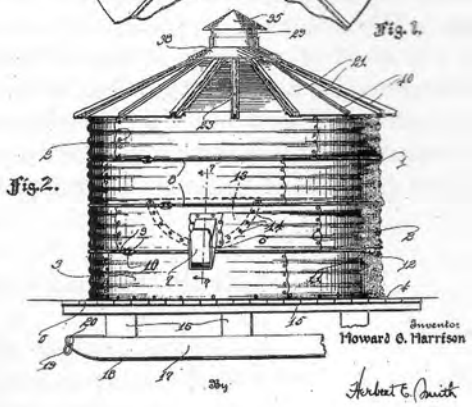


Fig. 2.

Inventor:
Howard G. Harrison
By
Herbert E. Smith
Attorney

1, 1942. R. B. FULLER Des. 133,411

PREFABRICATED HOUSE

Filed May 31, 1941

Fig. 1.

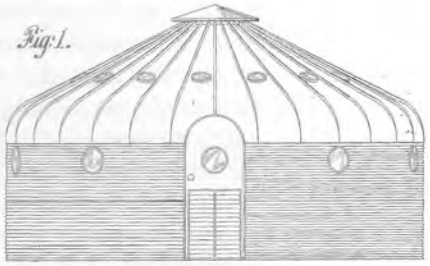
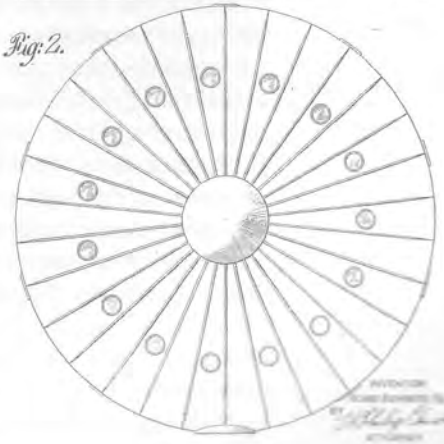


Fig. 2.



J. N. BALLOU & J. J. SHIRLEY.

STEEL GRAIN BIN.

(Application filed May 4, 1901.)

(No Model.)

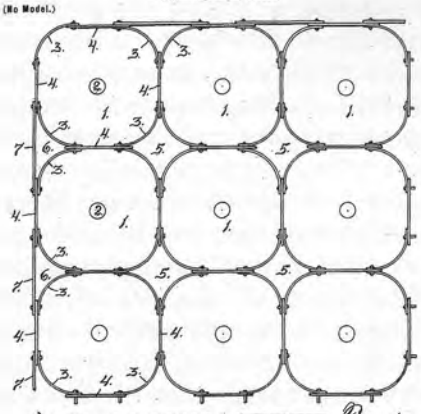


Fig. 1

Fig. 3.

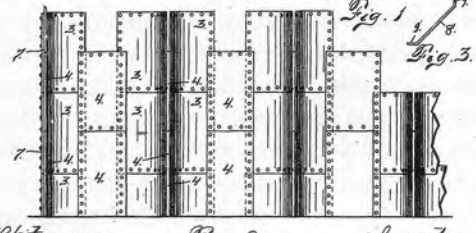


Fig. 2.

Witnesses:
C. B. Butler
Edw. C. Koester

Inventors.
James N. Ballou
Joseph J. Shirley
By W. T. Miller
Attorney.

Can Now?

Since World War II, canned products have been transformed from objects of necessity into cultural phenomena. Cans of Spam and Campbell's Soup have contributed both to the demise of the Eastern Block and the reemergence of (some of) those countries as part of the Western world in the early 1990s.[8] On an individual scale, processed foods have also been implicated in transforming us physically: preservatives used in canned foods are blamed for various cancers, not to mention the obesity epidemic. We have also arrived at the point where the original premise of canning, preserving food to enable an epic journey to the far corners of the world, is largely moot, as almost any remote point can be accessed faster than food can spoil. Another side effect of canning has been the "disconnect" of food production from food consumption. While food supply is still short in many parts of the world, a vast infrastructure built around instant processed preserved food is at a point where it is no longer sustainable ecologically, economically, or ethically. Today's emphasis is on the fresh and the local, not preserved or imported: "locavores" do not do cans.

And the Future Can ...

Today Steinbeck's Cannery Row is long gone. What remains is a vast network of supply, production, and delivery systems that has also outlived its intended usage. Scores of grain bins and silos dot the agrarian landscape, slowly rusting away, giving way to residential subdevelopments as food production shifts into its new paradigm. Instead of leaving the ruins behind and among us, like many other "legacy infrastructures" from the centuries of industrial boom, we wonder how some of this built-up mass that produced, packaged, marketed, and distributed a finished product can be of renewed use today and in the future. Rather than starting from scratch, knowledge and materials can be recycled—reutilizing existing tried-and-true supply and delivery methods for purposes beyond canned tuna. Furthermore, it is possible that the familiar image of this "infrastructure," along with its cultural and symbolic implications can be subverted for new rather than nostalgic purposes. There can be an evolution within the infrastructure. As political and social currents warm up, old infrastructure associated with "the ways of the past" becomes abandoned, a lesson that has been learned since antiquity. Yet also since that time, what was once "abandoned" has often become "repurposed." Consider the transformation of a roman arena into a medieval town a dozen centuries later. It is a development that is beyond the mere reutilization of brick and stone; it involves a change of scale, purpose, and societal convention, on the one hand, and direct reutilization of support system (enclosure) and a sense of place (appreciation for grandeur of a public structure), on the other hand. This simultaneous adaptation and invention normally takes a long time, but since speed and immediacy are characteristic of our time, we too imagine the possibility of "harvesting" canning, or at least certain manifestations of it, to new ends.

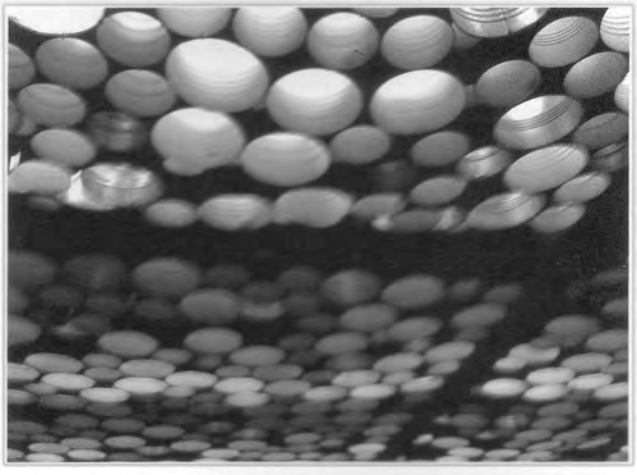
Consider a typical metal grain bin, 36 feet in diameter, roughly 1,000 square feet of interior footprint along with over a century[9] of amassed knowledge and technology associated with it. The production capacity that is associated with manufacturing, engineering, delivery, and assembly of these structures is truly impressive—within days, a new building, immune not only to weather outside, but also to certain internal

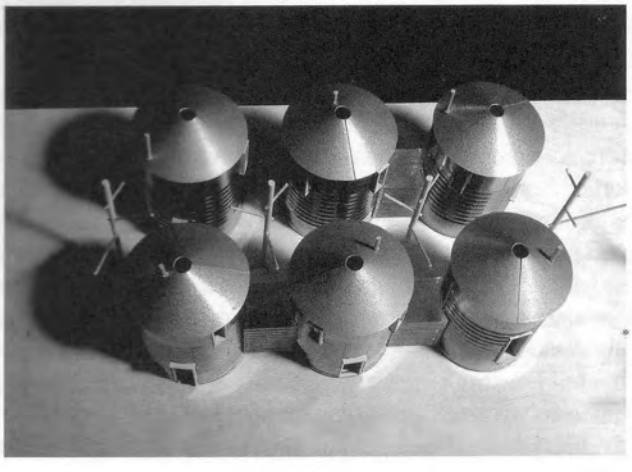
stresses and gravity, can be erected virtually anywhere. It is extremely durable, efficient, and inexpensive. There is a clear need for cheap quickly assembled structures for housing, storage, and even productive gardens on sites of earthquakes, landslides, brownfields, and so on that would allow displaced communities to be instrumental in supporting their own livelihoods. At a time when housing, both as emergency shelter and permanent construction, is a pressing issue across the globe, a metal grain bin, as an almost instant prefabricated housing solution, could be an attractive option. But in the last century, hundreds of patents on prefab houses were granted, and none of them made it into mass production precisely because they were lacking the manufacturing base associated with sourcing, fabrication, engineering, and delivery. In short, they lacked the fundamental infrastructure of a simple grain bin.

Apparently, the same appeal existed in 1943, when Buckminster Fuller's Dymaxion House was commissioned. The premise was beautiful: prefabricated metal shell, utilizing the excess of the military industrial complex, coupled with a passive ventilation system based on natural air flow noted to exist in a grain drier, combined with a prefabricated monocoque bathroom unit that was originally designed to be water-free.[10] Even though the infrastructural consideration was met, the house failed to enter into mass production. Much speculation exists on the Dymaxion failure: ultimately, the masterful consideration of "infrastructure" was simply not enough. It failed to consider the larger issue of "infraculture."

To the builders or the clientele of the suburban housing (at least in the United States), the failures of Dymaxion House and its "nonnormative" prefab brethren are quite apparent. One might ask: How do I live in a circle if my favorite couch, my kitchen table, and my armoire are rectangles? Why does my house not look like a "real house"? Why does it not look like the houses over in the next town? Will I be able to sell it? Will the others like it, even if I do? As primitive as they may appear, these are perhaps the most fundamental questions when it comes to housing: economics and aesthetics, tethered together in this mysterious notion of "curb appeal. "From the standpoint of local zoning codes and ordinances, "prefab" is not even considered on par with "real" housing and would more likely be relegated to a trailer park than be allowed in a "good neighborhood," citing lack of response and appreciation of the established residential context; in other words, again, the failure to uphold the curb appeal. Furthermore, even though prefab carries the promise of independence from local house builders and developers, this does not entirely hold true. Since building and zoning codes vary, regulating not only the appearance but, more importantly, delivery and connection of utilities, local contractors necessarily will be involved, at least in the foundation, mechanical, electrical, and plumbing work. And local builders and developers, ever sensitive to the balance of market forces and construction means, have devised a certain way of working that is tightly keyed both into the concept of curb appeal, and numerous other pragmatic considerations, such as market demand and construction materials, their sizes, prices, and availability. And fundamentally, construction loans, the financing and lending industry, fuel developers and builders alike. Lending parameters are defined by local real estate comparables and driven primarily by cumbersome assessment formulas as mysterious as the notion of curb appeal itself, resulting in a system in which prefabricated housing is not at all equally represented. More than 50 years of this paradigm has resulted in a fascinating amalgam of innovation and regression, manifested formally in the homogeneous suburban landscape with oversized and underused

housing stock—extremely efficient in the way it is built and extremely conservative in its appearance. The consequence is one that allows a very small margin of deviation formally and, therefore, structurally and materially.





Can Exterior

Now, nearly 70 years after Bucky's Dymaxion House, how might we begin to reconsider canned architecture? First, consider that the grain bin is not a foreign object and as such exists as a domestic infrastructure capable of its own role within the cultural milieu—as a signifier of country living. Metal grain bins continue to dot the American landscape; by now they are more symbolic of the pastoral farm of yore than a functional piece of agrarian infrastructure. Yet these structures transcend that symbolic role, for while often preserved as storage sheds, they have on occasion emerged as bespoke residences. This may take care of curb appeal: it is no longer a foreign entity, but rather a familiar, and increasingly more desired, sight. Along with an abstract image of a "house" (with a pitched roof) as a concept of domesticity, the grain bin can begin to conjure an image of farm living, a version of the American Gothic, albeit with a hint of industry, ingenuity, and innovation. Considered as an enclosure system, it is efficient and structurally sound—and builders would appreciate the possibility of erecting an enclosed structure cheaply, within days, in order to spend time on the interior build-out without being subjected to seasonal limitations of construction. Furthermore, as a function of quantity of material, the round exterior yields minimal perimeter and maximum enclosure, ultimately promising energy efficiency. Now that the age of the McMansion is over, the possibility of the expeditious erection of the house perimeter seems to be a more productive priority than its apparent opposite: maximum lot coverage with a single-story structure. This new way of living aligns with a readjustment in a new financial context and awareness of excess consumption.

Can Interior

The idea of inhabiting rotund spaces has a particular place in history of architecture—for it is often associated with exceptional, abnormal, elevated, or ceremonial circumstance—everything that is the very opposite of "domestic." The ancients preferred to bury their dead within circles—numerous rotund tombs dot Via Apia Antica in Rome—and to this day the tombs remain. Castel Sant'Angelo (née Hadrian's mausoleum) is an example of the repurposing of the infrastructure of the dead for that of the living. But at the time of the conversion of this tomb into a papal fortress, the idea of platonic shapes and their connection with the human body was being (re)discovered. Circles became appealing again. By the late Renaissance and beyond, the grandeur of a circular structure was further domesticated into Palladian villas, and eventually made its way into almost all corners of the old and new world.[11] Here, with a few modifications, it entered the American highbrow vernacular in Monticello, and even further, to the Oval Office in the White *House* (where the president sits at a rectangular desk).

After some flirtation with the rotund and the freeform in the 20th century,[12] the cylinders today remain largely unwelcome on a domestic scale. The problem is inevitable: a round hole into which square pegs of furniture and other domestic accoutrements must be inserted. In the past, within the architecture design studios (in this esteemed institution and beyond), certain colloquial terms were developed to describe various spatial conditions of a plan—such as the fried egg (referring

to a well-defined figure on the interior and a flexible, porous perimeter). Perhaps it is time to introduce another term—a breakfast of two soft-boiled eggs, for example, referring specifically to the "can condition," where both the rigid perimeter and the flexible interior can be addressed in the academic setting.

And in its new manifestation, the grain bin (or cluster of grain bins, à la the six pack) can become a canister for storing the humanoid, her possessions, her partner, and her pets, as well as all of their systems of *well-being* and concepts of *well-living*—without losing sight of the American Dream of a single and detached dwelling in the landscape. This newly conceived can allows a reengagement with history, ecology, and society of the American landscape. It can provide for the residents' civility toward themselves, as well as toward those who came before, through ingenious reuse; and those who will come after, by resourceful management of materials and resources. Perhaps this will constitute an essence in the creation of sustainable infrastructure, in which we, the people (and architects), can play a central role.

Endnotes

1 http://www.epa.gov/waste/nonhaz/municipal/pubs/msw2008rpt.pdf.
2 A search in the *New York Times* archives reveals that phenomenon.
3 For an example of cultural iconography, witness the original tin can in the Museum of Modern Art's Design section, as well as silk screens by Andy Warhol. As an example of canned food as a cultural pariah, consider Spam. Last, consider the Soviet Ministry of Culture denouncing Andy Warhol's art as "anti-Soviet" while distributing cans of Spam as "food bonuses" to its employees.
4 This version of the invention of food conservation process is embraced by the American Canning Association—and can be found in its annual publications.
5 Several U.S. and British patents were issued around the same time.
6 Though demand in the United States is low, most of the steel bin manufacturers refocus on overseas markets (i.e., Russia, China, and Latin America) or attempt at advertising their product for other purposes (i.e., general storage).
7 Though it spawned a whole industry of agrarian metal buildings. See http://www.ussteelbuildings.com.
8 In the late 1980s various Western food containers started to penetrate the iron curtain. While their contents were consumed, the containers themselves became venerated objects of desire: they were traded, repurposed, reused, or even simply displayed in people's homes as artifacts from the other, foreign, world.
9 Patented around 1900.
10 The early conception of Dymaxion House is described in Beatriz Colomina's *Domesticity at War* (MIT Press, 2007).
11 In the year that the world celebrated Andrea Palladio's 500th birthday, we would like to put forward the idea that his *Quattro Libri* is singlehandedly responsible for the proliferation of the roman circle in the world.
12 Consider, on the one hand, Le Corbusier and the idea of the free plan; and on the other hand, Konstantin Melnikov, with his 1926 house in Moscow—a twinned cylinder system that was developed as a prototype for efficient worker housing.