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THROWAWAY HOUSES

Garbage housing and the politics of ownership

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During an interview for the TV station of the Architectural Association (TVAA) in 1975, architect and critic Martin Pawley explained the origins of his decade-long project, Garbage Housing. Though the undertaking had matured into a fully-fledged antidote to the housing crisis, Pawley conceded that it started as an exploration of the ambiguity of meaning produced by ‘combining a pejorative term “garbage” with a valued term “house”’ (TVAA 1975). In saying this did Pawley mean that housing was akin to garbage, just a disposable object like any other consumer product? Or did he mean to imply that a house should be constructed out of throwaway materials? Or did Pawley mean to say that public housing was in a state of decline, like other sociologists and housing workers of the time (Cupers 2016)?

Pawley mined the potential of the Garbage Housing project through a series of design studios, research programmes, books, and critical essays from the beginning of the 1970s until the early 1980s. The stated goal of his research was to address shortages of housing by transforming consumer waste into building materials for low-cost construction. But Pawley also intended Garbage Housing to be a provocation to cultural and political norms. According to Pawley, the reuse of consumer waste for housing questioned the assumption made by housing policy that ‘value [is] the expression of a single use, and a single use the sum of a useful life’ (Pawley 1975a, 34). In place of a ‘single use’, Pawley proposed a concept of ‘secondary use’, imagining that consumer products and packaging could attain a second life as building materials or other uses.

By elevating trash and denigrating housing, Pawley exposed the ideal of privately owned, permanently occupied housing. Like Archigram and other proponents of expendable architecture during the 1960s and 1970s, Pawley imagined the house as a throwaway object on a par with an car or even a box of Sugar Puffs cereal (Archigram 1999; Colomina 2007; Pawley 1975a; Steiner 2008). Garbage Housing

embraced the consumer economy by integrating the manufacture of products and their reuse into a total system. The components of the garbage house were, in theory, indistinguishable from other consumer products and were thus easily disposed of and replaced, giving users more control over the construction and adaptation of their houses. Secondary use harnessed the immense productivity of consumer industry, making secondary use products and building materials free and widely available to users (Pawley 1976). Rather than construct housing, Garbage Housing expanded ownership to new users by making building materials easy to acquire and use, and then scrap.

In the 1970s, however, Pawley's designs for mass production transformed into studies of ad hoc, labour-intensive reuse of materials. Responsibility for Garbage Housing changed from a state sponsored industry to that of individual users. The impetus to change course was not merely technical. The political and economic backdrop to Garbage Housing transformed over the duration of his research, challenging presuppositions made by Pawley and his students about the production, use, and temporality of secondary use products. Though he conducted the majority of his research on the subject of garbage at American universities, Pawley's work was also informed by debates among politicians, social scientists, and development experts about the expansion of private home ownership in Britain, as well as the global South during the 1970s (Pawley 1978). The shadow of the Conservative ideal of a 'property owning democracy' in Britain loomed over his critique of housing policy, as did the uncertain political fate of housing constructed by the state after the Second World War (Forrest and Murie 1988, 25).

An examination of Garbage Housing sheds light on the sociopolitical motivations of early inquiries into architectural uses of waste materials such as bottles, sulfur, and commercial discards. The chapter focuses on techniques of assembly and construction in designs for three houses, at Cornell University (1973), Rensselaer Polytechnic Institute (RPI, 1975–1976) and Florida A&M University (FAMU, 1977–79) respectively. In each instance, Pawley and his collaborators used the design and reuse of consumer waste in order to reimagine the political economy of housing.¹ Like other research about alternative building technologies during the 1970s, Pawley kept Garbage Housing at arm's length from overtly political struggles over housing and land (Pawley 1971a, 90).² But while they shied away from political movements of the time, close scrutiny of Garbage Housing demonstrates that Pawley and his students grappled with new forms of governance and political rationality. The project's transformation from a partially state-sponsored program of housing in the early 1970s to a framework for individual skill building by the end of the decade signalled the retrenchment of the state from housing and the institutionalization of neoliberal norms of conduct. Still, Pawley imagined Garbage Housing as an experiment in the truest sense. As such, it was open to failure: Garbage Housing risked becoming single use. If not by design, the disposability of houses exposed the limits and contradictions of a property-owning democracy.

System building

Pawley initially conceived of Garbage Housing as an exercise in what he called 'system thinking' on a grand scale (Pawley 1971a, 90). Pawley's overtures to systems thinking were at once technical and political. He proposed that the housing industry should be inserted 'into the total complex of industrial production', liberating housing construction and maintenance from overly specific and redundant architectural products (ibid., 90). Short of designing a house, or housing, the architect of Garbage Housing designed systems.³ In his design studio at Cornell University (1973), Pawley and his students imagined new uses for garbage, redesigned consumer products for secondary use, and, where necessary, designed joinery in order to translate ordinary products into building materials. But systems thinking was also a reproach to political debates over the privatization of housing. In his 1971 essay, Pawley explained that a systems-based approach to housing was designed in response to the battle being waged between market ideologues and the State in Britain. Pawley's image of 'housing as a total system' replaced political struggles over housing with managerial dilemmas about resource utilization, repackaging social obligations such as housing and waste disposal as resources in need of management (ibid., 90).

During a visit to Chile in 1972, Pawley encountered an example of systems-thinking at an unprecedented scale. The *Unidad Popular* government was in the process of shepherding the transition from capitalism to socialism, using cybernetic models of management to redistribute authority to workers and factories (Medina 2011). At the International Housing Conference in Santiago (1972), Pawley proposed that the Chilean state undertake a 'highly visible, well-advertised government programme' to encourage the manufacture of secondary use products (Pawley 1975a, 117). Though the Allende government pursued the nationalization of manufacture, Pawley proposed that the system feed off consumer manufacturers in the West, such as Coca Cola. He insisted that their entry into a socialist market such as Chile should depend on their manufacture of secondary use products and subsidiary parts such as 'clips, jointing devices, extension pieces, preformed blanks and so on' (ibid., 117). A commitment to the Chilean market would then also be a commitment to its housing programme, resulting in a parasitic form of value such that 'the price of a can of beans or a bottle of detergent' was also 'the price of a house' (ibid., 117).

After reaching an agreement with Allende's Minister of Housing, Gonzalo Martner, Pawley commenced a study of prototypes for emergency housing with students at Cornell University in exchange for up to date information from the Chilean Ministry of Planning (ODEPLAN) about domestic production (Pawley 1975a, 92). Though the economic and political situation in Chile rapidly deteriorated soon after Pawley returned to Cornell, Pawley and 12 students proceeded to design three 'shells' constructed from products that they determined were available in Chile's inflationary economy (Pawley 1975a, 92–97; Perez de Arce 2015, 97).

The shells took on familiar, iconic forms made from everyday waste. An icosahedral structure drew support from *papier maché* studs made out of stacked soft drink and beer cans that were wrapped in paper. Warren Lee and David Mantanari's shell took the form of a Corbusian barrel vault, using cans as *voussoirs* sandwiched between cardboard panels (Pawley 1973, 783). Other forms recalled consumer products. John Zissovici, a student in the studio, has explained that the system for making studs out of stacked soda cans rolled in paper resembled a large cigarette roller (John Zissovici 2013, pers.comm., 8 August). Students also used the scale model for their system to roll cigarettes. Much like their cigarettes, Zissovici and his peers rolled structure: 'It was like a stud wall but we rolled the studs' (ibid.). The substance of cans and cardboard were unaltered, if deformed. Lydia Kallipoliti argues that substitutions of this kind represented a concern for 'hard' production methods in Pawley's work, signalling a change in context and syntax rather than a 'soft' change in substance (Kallipoliti 2013, 256). Students transformed a bicycle into a skylight, for instance, merely by way of changing its context (Pawley 1975a, 95).

Student Jeffrey Skorneck proposed a more outwardly visible change of context: a house made with the unused parts of a Citroën van (Figure 15.1). According to Pawley, the Citroën factory lay dormant due to the collapse of foreign credit lines in 1971, leaving a surplus of body parts and an unused production line (Pawley 1975a, 92). In response, Skorneck repurposed the factory to produce the materials for housing (Skorneck 1973). The strategy was a clear reference to precedents such as Buckminster Fuller's Dymaxion House (1928–1945) and the British AIROH house (1945), both of which made use of aircraft manufacturing methods and production lines for the construction of housing (Pawley 1984). Pawley imagined that the priorities of the factory would shift in Skorneck's project according to changing political-economic circumstances, creating a symbiosis of first and secondary use economies (Pawley 1975a, 97–98). Car manufacture, Pawley anticipated, might predominate after engines and transmissions were available again.

The car served as both metaphor and paradigm for Pawley's approach to housing. On the one hand, automotive manufacturing was a model for the industrial production. On the other hand, the car-like qualities and functions of the house indexed the growing mobility of society at large. New conditions of ownership unshackled the individual from the lifestyle of a permanent home. As Pawley observed in *Architecture Versus Housing*, the purchase of a car did not require the purchase of a 'stretch of road' (Pawley 1971b, 110). Why, he asked, should the purchase of a house be tied to the purchase of land? The scarcity of land in Britain and the rise of speculation and housing costs during the 1970s led Pawley to conclude that the capitalistic bond between housing and land should be severed completely. Pursuing the car analogy further, he imagined that the 'rental or hire-purchase of detachable [house] units ... could undermine the principle of ownership altogether', thereby 'replacing the traditional idea of possession with a new one of *temporary rights over things*' (ibid., 112).

Skorneck's 21-page document of manufacturer's and original assembly drawings was in this respect an 'owner's manual' for the Fourgonnette house. He emphasized

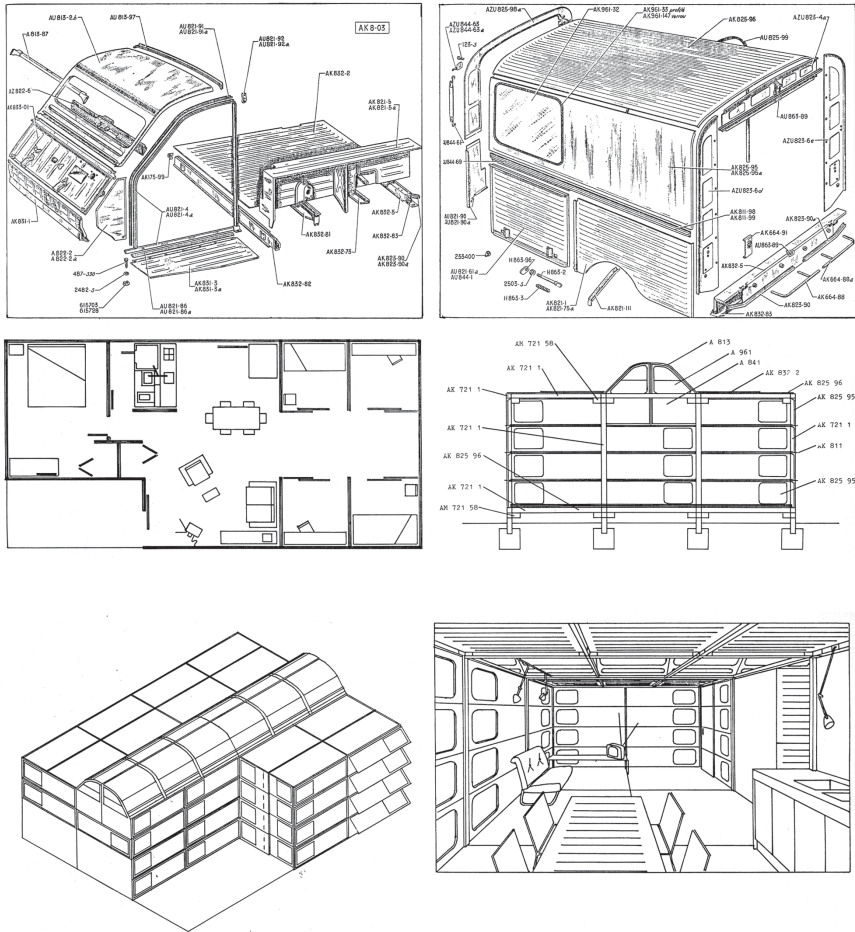


FIGURE 15.1 Drawings, *Automobile Body Components Housing, Citroen 2CV Fourgonnette*, Jeffrey Skorneck, 1973. Source: Reprinted from *Garbage Housing*, Martin Pawley, pp. 90–91. Copyright (1975)

that the high tolerance of body components was amenable to rapid assembly and unskilled labour, assuring that the occupants of the house could dispose of and repossess the parts of the house – and by extension the house itself – with considerable ease (Skorneck 1973, 2–3).

Though the conversion of car parts to building materials required a repurposing of meaning and use, car body parts retained many of their qualities and functions. Skorneck carefully studied and reused manufacturer's drawings of a 2CV Fourgonnette van, appropriating the Citroën's panels for a roof, sheer wall, and the windows of the house. The interior assumed the quality of an oversized vehicle cabin, replete with bench seats and a low ceiling profile. Skorneck proposed that 'support systems' such as the headlamps and alternator be drawn from Citroën

leftovers for use as lighting and ventilation, respectively (Skorneck 1973, 21). Shock absorbers from the van would also be used to separate floor framing from the foundation as protection from seismic volatility. Skorneck may have designed a house, but the Fourgonnette house was replete with the trappings of a car.

In *The Private Future*, Pawley acknowledged that the car was an emblem of growing privatization of all aspects of life, writing that ‘the car is a social diving suit, an isolating personal environment ... all cars are getaway cars’ (Pawley 1977, 59). But the Fourgonnette house was no fast escape. While the occupants controlled the architecture of the house, its assembly would have relied on the coordination of industry, the state and other intermediaries, a managerial role that Pawley granted to the architect. Construction depended on output from government factories and state-led efforts to manage the social and technical tolerance of automotive parts, including the production of joinery and advertising aimed at bridging the gap in meaning between car and house. With the managerial role for the architect and architectural knowledge, the role of industry and socialist planning faded from Pawley’s research and teaching.

A pedagogy of reuse

Because of the overthrow of the Allende government in 1973, Pawley was forced to wait until the latter half of the 1970s to construct more permanent, occupiable garbage houses, first at RPI and then at FAMU. On paper, the production and reuse of waste materials required the architect to coordinate between industry, governmental institutions, and resource recovery operations. In practice, students and faculty at RPI and FAMU were forced to make-do with the discards of existing systems of production and consumption. Localized maintenance of building materials and ad hoc agreements about their procurement superseded the management of large-scale systems, challenging the protocols and politics of parts-based manufacture and assembly. Time gained new meaning in their work, shifting from an overarching preoccupation with speed of production and assembly of parts to concerns about the ephemerality of low-cost housing and the decay of cans, cardboard, and other waste materials over time. Indeed, Pawley’s approach to garbage housing changed after the 1973 Oil Crisis, as growth and other mantras of postwar development appeared increasingly ephemeral.

Pawley and his students constructed a nominally habitable 600 square foot garbage house on the campus of RPI for Professor Dora Crouch during two terms and the summer in 1976 (Haviland RPI 1976; Pawley RPI 1976b), boasting that it cost a mere \$501.70. Like the Cornell studio, the design process relied in large part on hands-on, site-based problem solving. Pawley rationalized the manual appropriation of consumer products as a ‘put up or shut up’ approach to architectural work (Pawley 1976a). But hands-on study of materials and systems was also a reproach to dominant modes of housing production, demonstrating the role of ‘use’ in Pawley’s teaching methods and criticism. Like other critics of housing in the 1970s, Pawley argued that impersonal government redevelopment

schemes and other efforts at consumer housing interrupted the individual's biological and cultural attachment to property, hindering their ability to personalize and appropriate the environment around them (Cupers 2016; Habraken 1972, 12–13; Pawley 1970, 132–138). In *The Time House*, the essay accompanying his diploma project at the Architectural Association, Pawley contrasted a personal relationship with objects to prevailing functionalist doctrine, which, according to Pawley, demanded that an individual shed accumulated experience like a snake sheds its skin (Pawley 1970, 141–142). Instead, 'historical evidence seems to indicate that the design, use and retention of objects is an accumulative process like learning or growth' (Pawley 1970, 141). Garbage Housing extended his critique to the reuse of consumer waste. Though consumer objects were also impersonal and mass produced, he imagined that their reuse allowed users to contextualize and personalize them to their own needs.

Studio assignments approximated Pawley's conception of housing as a process of continuous making and change (Pawley 1976a). Pawley always emphasized hands-on studies of materials over architectural drawings, placing the burden of proof on full scale mock-ups (Lawrence Birch 2018, pers.comm., 24 April; Pawley RPI 1976a; John Zissovici 2013, pers.comm., 8 August). He also periodically assigned 'sketch projects' in between studies of materials and building. His definition of sketching was capacious, using drawing and blocks of information to situate concepts about reuse within a system of material flows. For instance, the first sketch assignment for the Dora Crouch house required students to demonstrate the feasibility of their ideas by showing 'materials used, general construction methods, confirmation of sources and availability of materials used, outline cost implications and delineation of problem areas to be resolved during detailed design' (Pawley RPI 1976e). Like the construction of physical prototypes, sketching was open-ended and responsive to changes in waste materials, ranging from cost and availability to physical characteristics. By contrast, drawing would have interrupted an otherwise accumulative process of learning.

The acquisition of materials for the Dora Crouch house further reinforced the role of individual, personal appropriation of mass produced objects, drawing on materials that were readily at hand (Pawley RPI 1976c). The frame of the house was comprised of columns and trusses made of 4-inch cardboard tubing from a local newspaper company (Pawley 1982, 5). Cans sourced from a local manufacturer, campus food services, and generous local residents served as truss joinery and purlins for the cardboard tube structure and infill for walls (*ibid.*, 5–9). Further, the president of a regional rubber company offered the by-products of automobile bushing manufacture after hearing about the project on a local radio show, donating 2-foot-by-2-foot sheets of neoprene that Pawley's team used for roofing (*ibid.*, 13). In the draft of an article submitted to *Architect's Journal*, Pawley referred to it as a 'roof good for 30,000 miles', playing on ad slogans for the life cycle of car tyres (Pawley 1976d) (Figure 15.2). In marked distinction to Pawley's initial plans for secondary use manufacturing in Chile, material procurement was forged off the cuff, reliant on equal parts serendipity and intention.

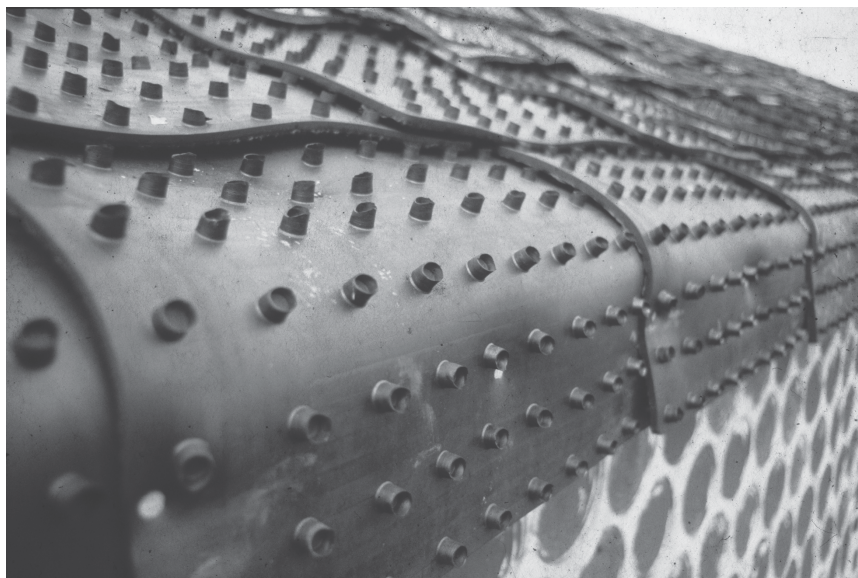


FIGURE 15.2 'A roof good for 30,000 miles', showing the neoprene tiles of Dora Crouch House, 1976. Source: Private collection of Philippa Morrison and Oliver Pawley

Waste materials proved volatile. In an infelicitous encounter between smoking teenagers and tar sealant, the first paper tube frame went up in flames (Pawley 1982, 5). A second study of steel cans was destroyed by vandals (*ibid.*, 5). The first roof, constructed out of cardboard tiles that were cut from old furniture boxes and infused with sulfur, was destroyed by a rainstorm (*ibid.*, 13). Polyethylene panels were then used as an alternative, but these deteriorated under UV radiation. After initial completion of the house, the cans rusted, leaking water into the house and leaving rust streaking down the façade (*ibid.*, 15). Using leftover sulphur, the students applied a sulphuric glaze over the cans, creating a waterproof layer that disguised the rusted surface (*ibid.*, 17). Different heating times and temperatures created variable shades of yellow, leading to a camouflage-like pattern on the exterior (*ibid.*, 17).

Design happened in stopgap measures and handshake agreements. All labour focused on sourcing and figuring out materials. Pawley relished the ad hoc quality of their work, describing a 'strange exhilaration' in the 'absolute poverty' of their situation (Pawley 1982, 16–17). It suggested a different mode of production than his earlier propositions: 'I myself had become convinced,' he wrote, 'despite all mistakes and exaggerations, that it was possible to develop a technology to build with wastes *as they are*, instead of processing them into special building materials at giant municipal facilities' (*ibid.*, 15). The sulphuric hues of its walls and neoprene nipples on its roof amounted to a weird, discomfiting beauty (*ibid.*, 19). Envisioned initially as a system of industrialized forms of assembly, his experiments turned out to be more

unstable than anticipated, demanding in situ management of messy, unpredictable changes in the substance of waste material.

If the assembly of interchangeable parts correlated to Pawley's image of the architect as a technocratic intermediary, the bleeding, rusting amalgams of materials and ad hoc forms of assembly required another role for the architect and the potential occupant of a garbage house: incremental maintenance and upkeep. The final assignment for the class in October 1976 asked students to speculate on the long life of the house by creating a new design brief that included plans for weatherizing the house for the winter, improvements to the interior in order to make it more habitable and potential extensions to the home in the service of 'increased longevity' of the house (Pawley 1976a). Where design and maintenance started and stopped was unclear at best, given that much of the construction process involved ongoing weatherization of consumer and commercial waste.

The unfinished house

During the early 1970s, Pawley argued that industrially manufactured, throwaway housing liberated home ownership from the vicissitudes of the real estate market and state control. Pawley wrote in 1971 that the components of a housing system could be 'transplanted, renewed, repaired or updated like a human organ' (Pawley 1971a, 90). As a result, he argued, the 'house is never finished' (*ibid.*). Pawley's research changed during the late 1970s. As director of the Experimental Low-Cost Construction Unit (EXCON, 1977–1979) at FAMU, Pawley studied the design of services and incremental improvements to houses instead of designs for a housing system. Though the shift in Pawley's research reflected growing consciousness about energetics after the Oil Crisis in 1973, it also represented changes in the political economy of housing. EXCON research operated under the assumption that home ownership for low income households in Florida was indefinitely deferred, due to state retrenchment from housing production and severe poverty. Was the unfinished quality of houses a route to ownership, as Pawley imagined, or evidence of its postponement?

Pawley moved from RPI to FAMU in Tallahassee in 1977, after an invitation from Dean Richard Chalmers to direct a graduate-level research programme in the newly formed architecture school (Michael Alfano 2018, pers.comm., 18 June).⁴ Though garbage remained important to Pawley's pedagogy and research at FAMU, energy use took precedent in the form of a two-year research project, Energy Efficient Technologies and Methodologies for Low-Income Rural Housing in Florida (1977–1979). From the onset, Pawley established the goal of the programme as improvement of existing housing stock. He stated in a grant application that EXCON research about low-cost energy saving technologies aimed to determine the 'economic possibility to finance improvements' in the energy efficiency of dwellings (Pawley FAMU 1977). The programme commenced with a survey of energy 'deficiencies' in 320 houses in rural Leon and Gadsden counties, concluding that they lacked inoperable windows, control over air circulation,

adequate insulation, and protection from infiltration of air (EXCON 1978, 17–18). The survey, and the conclusions drawn from it, focused on the infrastructure of the home. Rather than propose significant, expensive renovations to rural houses, Pawley asked students to use survey data in order to develop a series of ‘energy kits’ and other basic infrastructure that resolved specific deficiencies but left the architecture of the existing houses largely intact.

Energy kits, ducts, and pipes plugged into and encircled the existing structure of a shotgun house that was donated by Ms. Hora Buchan, a resident of Tallahassee (EXCON 1978, 18). Similar to research conducted at Cornell and RPI, prototypes in the Buchan House drew from a milieu of locally available discards, low-cost building components, and simple tools. Once again, Pawley appropriated car parts for a new use (Figure 15.3). He observed that disused car hulks often sat outside

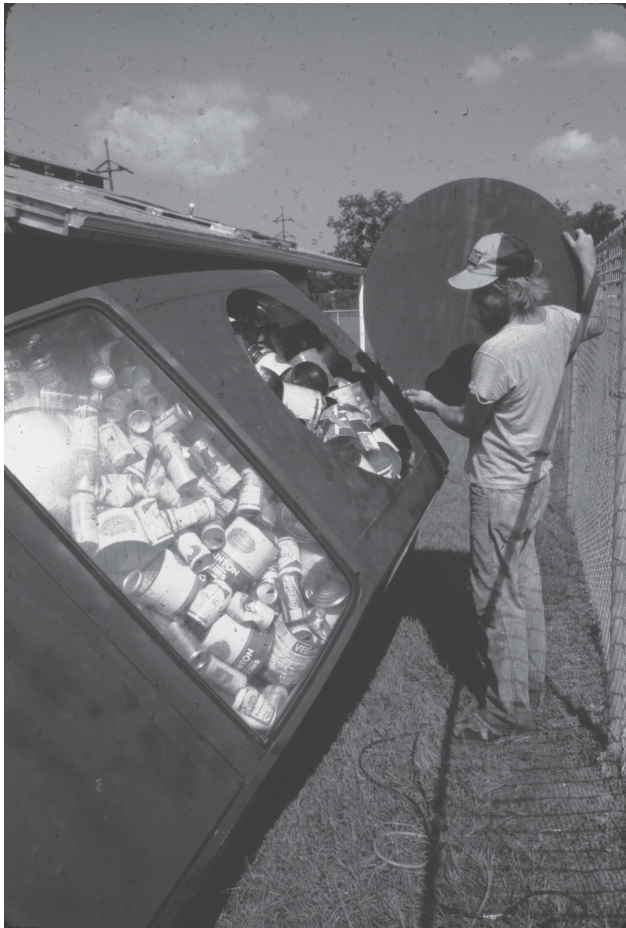


FIGURE 15.3 Filling the Buchan House ‘auto collector’ with disused cans, 1978.
Source: Private collection of Philippa Morrison and Oliver Pawley



FIGURE 15.4 Space Addition System (SAS), David Tod Hollister, 1979.
Source: Private collection of Philippa Morrison and Oliver Pawley

dwelling that lacked space heating, sparking inspiration for a solar heat collector in winter months (EXCON 1978, 29). Pawley salvaged a 1970 Plymouth Arrow at no cost from a local scrap dealer, stripping the cabin of interior fittings and filling it with waste aluminium and steel cans, a fan and a duct that attached to the house (EXCON 1978, 28–34). Another installation circulated air from inside the house through an underground duct made out of tyres and polyethylene in order to cool the interior (EXCON 1978, 97–99). The upturned Plymouth and wormlike tyre duct reprised themes from the Fourgonnette and Dora Crouch houses, re-contextualizing car parts and discards. Only now, the car was not a building material. Energy kits such as the car collector modified the environmental conditions of the home but not its architecture.

Like energy kits, EXCON thesis projects examined incremental improvements to the architecture of existing houses rather than designs for an industrial housing system. Student David Hollister, for instance, developed what he called a ‘Space Addition System’ (SAS) of rigid hulls that were constructed out of sealed, folded cardboard sourced from home appliance boxes (Hollister 1979) (Figure 15.4). Hollister constructed two small rooms that he affixed to the Buchan house, projecting the life span of the SAS to be a mere 5–10 years (*ibid.*, 27). He rationalized the expendability of cardboard by observing that many houses in the energy efficiency survey were nearing the end of their life, due to poor maintenance and intractable poverty (*ibid.*, 27). Consequently, the structure bordered on disposable. The SAS could be attached and removed from a house, but cardboard was fixed in place by adhesives

and waterproofing, meaning that the structure would have to be thrown away after use. Like the installation of services, the SAS was designed to achieve modest, temporary improvements in the comfort and cost of domestic life.

In part, this was due to Hollister's unease with restrictions imposed by state support. He concluded that state subsidies and other poverty alleviation programmes were unsuitable to existing socio-economic realities of low income occupants in rural Tallahassee. Hollister observed that subsidies from the Federal Housing Administration relied on standards of construction and repair that were too costly for low income occupants, resulting in the demolition of houses or denial of funding (Hollister 1979, 25–26). Further, grants and subsidies privileged the rehabilitation of homes for owners, rather than renters, overlooking the considerable number of renters in rural Tallahassee (*ibid.*, 27). In response, Hollister designed the SAS to avoid subsidies altogether, limiting its cost to the minimal budget of a low income household. Together with the installation of energy kits and basic services on the Buchan house, Hollister proposed improvements that severed the house from infrastructural support, financial or otherwise.

Support assumed other forms, however. Training and service formed the human material of EXCON inquiry. The last and final phase of Pawley's research about energy efficiency at FAMU was comprised of an 18-week job training programme of 'economically disadvantaged persons' from the community (Pawley FAMU 1977; EXCON 1979). The programme rehashed the pedagogy of the EXCON design studio, training students in the analysis of energy efficiency and the design and construction of energy kits. In part, the EXCON programme's focus on service reflected growing concerns about educational opportunity in the United States during the late 1970s. EXCON research was funded by STAR (Service Through Application of Research), a state grant programme that prioritized energy and educational opportunities in the state of Florida (STAR 1977). FAMU, a historically black university, was itself situated at the crossroads of equal opportunity politics during the 1970s. The architecture school was founded in 1975 in response to Federal pressure on the State of Florida to desegregate higher education (Michael Alfano 2018, *pers.comm.*, 18 June). Service animated all levels of FAMU pedagogy, ranging from a Masters level programme about government service to extension programmes such as the EXCON job training programme (*ibid.*). A FAMU poster from the late 1970s conveyed the school's worldview: 'today the scope of architectural services has broadened to include improvement of the quality of life itself' (FAMU 1979).

Training programmes were designed to give occupants greater control over the housing process by building knowledge, not architecture. Was service all that remained of Garbage Housing? Constraints imposed by subsidies and grants restricted the scope of EXCON work to the study of temporary improvements to derelict houses. In response, Pawley and his students accepted that ownership remained out of reach to the majority of surveyed households. Given that their research stopped short of designing housing for economically disadvantaged, largely African American residents in Tallahassee, the programme's focus on skill

building and basic infrastructure may have reflected the architectural limits of waning efforts to redistribute wealth and opportunities in the United States. Garbage Housing prototypes at Cornell and RPI were unfinished by design; Pawley and his students imagined that occupants would continue to renew the walls and components of houses after they occupied them.⁵ But houses in rural Tallahassee verged on abandonment and finitude. Devoid of industry or state support for reuse, garbage itself risked lapsing into mere expendability. Had housing also become a one-off use?

The application of garbage to housing for economically disadvantaged communities of colour made EXCON research vulnerable to criticism that the use of ephemeral, abject building materials made people disposable, reinforcing their abandonment by the welfare state (Bauman 2003). In response to Hollister's SAS, a planner in Tallahassee cautioned that elderly African American residents would refuse to live in 'something made out of garbage' (Hollister 1979, iv). Years earlier, the Chilean audience at the International Housing Conference balked at Pawley's proposal for secondary use housing, expressing dismay at the prospect of greater dependence of the Chilean market on American or European industry (Pawley 1975a, 89). The ambiguous meaning of Garbage Housing left open the possibility that the value of waste could be perceived as equal to that of housing. But when used in housing for disadvantaged social groups and contexts of structural inequity, garbage remained just that. In the eyes of potential occupants, bottles remained bottles, and bricks remained bricks.

Pawley's research about secondary use design claimed that occupants would redress the supposed failures of mass housing if given the material resources to build for themselves. Bottles and cans, not home plans, served as building blocks for social improvement. At the International Housing Conference in 1972, Pawley argued that self-determination derived from consumption. He explained to the audience that Chile's national housing programme 'must emerge from the reality of the people's pattern of consumption, from the investment of their own labour, and from the enthusiasm of their own ambition for betterment' (Pawley 1975a, 116–117). But, ironically, responsibility for Garbage Housing rested on the shoulders of those who were denied access to home ownership and the benefits of a consumer economy. By the late 1970s, incompletion of houses signified the inability of such occupants to possess their houses fully.

Pawley's advocacy of the cause of Garbage Housing bears striking resemblance to contemporary arguments for industry-led production of reused and reusable consumer products (Braungart and McDonough 2002). But Garbage Housing and other architectural uses of waste during the 1960s and 1970s differed in motivation, subordinating moral and technical claims of environmental responsibility to the pursuit of housing. Research by Pawley, John Habraken, the Minimum Cost Housing Group and other architects threaded concepts about environmental stewardship with different approaches to the provision and maintenance of low-income housing (MCHG 1977; Pawley 1975a, 26–34; Wilson 1979). While it may be

tempting to revisit Pawley's proposition as a model for rethinking the consumer industry and sustainable design more broadly, his critique of home ownership is indispensable to understanding the role of waste materials and other alternative building technologies in designs for new structures of responsibility for housing during the 1960s and 1970s. That Garbage Housing included research about waste and energy use only underscored that Pawley imagined responsibility for housing as an extension of management of the environment at large.

Notes

- 1 Like Pawley, Buckminster Fuller envisioned a housing system based on industrial production and temporary ownership of housing components. Jonathan Massey writes that Buckminster Fuller's proposal for a shelter subscription service 'used design to rethink the political economy of housing' (Massey 2012, 35).
- 2 For example, see the Minimum Cost Housing Group's series 'The Problem Is...' (MCHG 1977).
- 3 My use of 'system building' is an allusion to Thomas P. Hughes' analysis of the development of large technological systems (Hughes 1987).
- 4 Pawley conducted EXCON research with the assistance of FAMU professor Lawrence Birch, a former student of Pawley's at RPI who went on to work at USAID.
- 5 The incompleteness of Garbage Housing reflected similar approaches in international development work during this time, including 'site and services', 'self-help', and 'core housing' models (Muzaffar 2007).

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