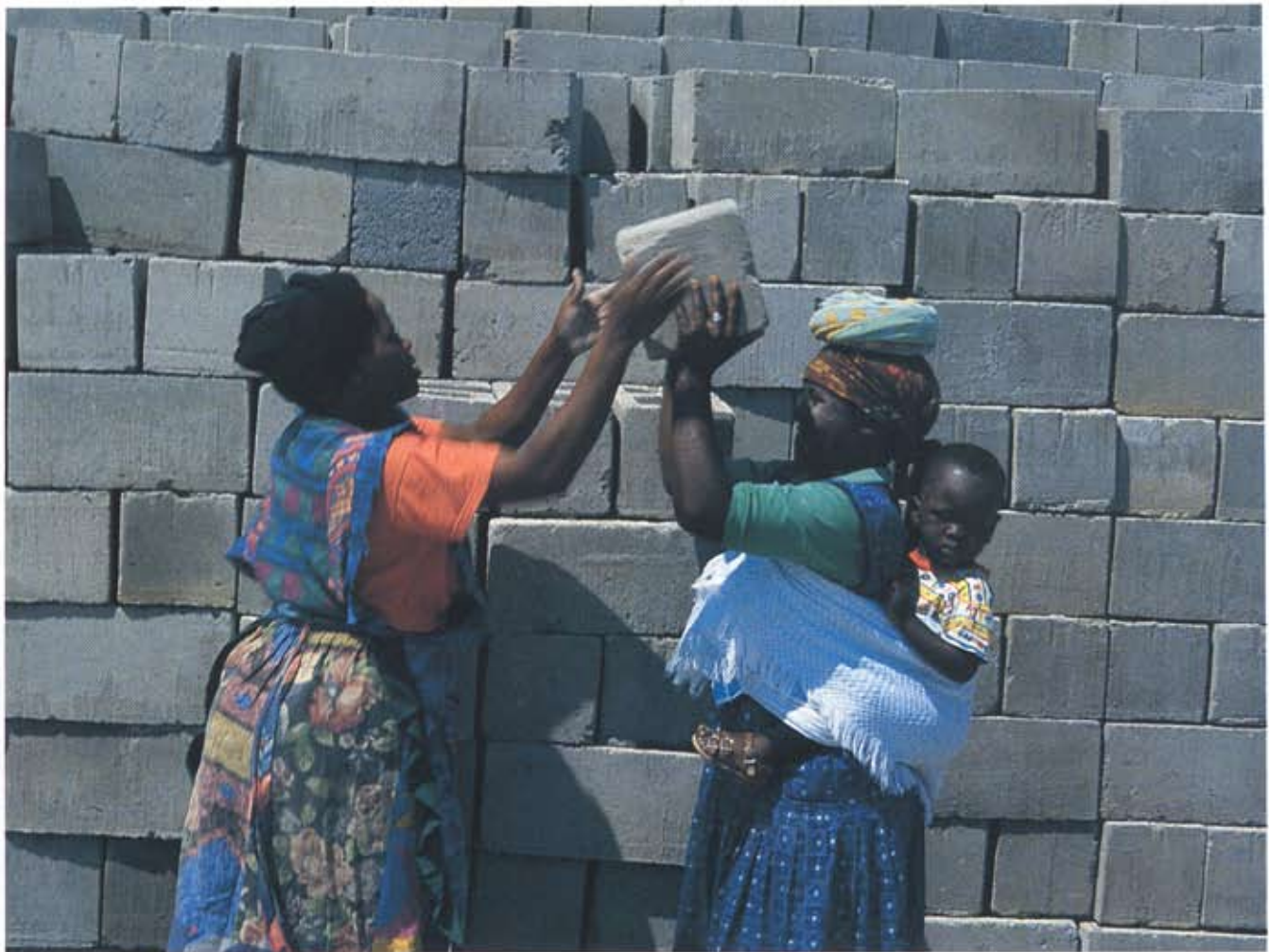


Out of the & into the mud

This article examines four housing projects in which the future occupants are involved in a hands-on way in the building process and in which there are architects participating, albeit in perhaps unconventional roles. Three are in what could be called the 'green' camp and one in the 'development' sector. These camps are usually thought to have different, if not opposite aims, yet there is at the core of these projects, a deeper force that links them.

The nineties have been termed the decade of the environment. There is a general perception that the planetary support system – clean air, water, nutritious food, natural beauty – at one time seemingly without end is about to fail us. We are about to lose our home and therefore ourselves unless we find ways to exist that instead of exhausting, replenish the environment. The fifteen thousand year old notion of man's dominance over the world, a kind of omnipotence fantasy invoked by the invention of agriculture, is now giving way to one of a mothering, albeit ailing, earth.

Story and photographs by Ruben Mowszowski



The desire to redress the harm our species has done to this earth lies behind many individual efforts to build in a green manner. To heal the mother by living in a manner in which energy taken equals energy replaced and in so doing to keep our environment clean and healthy – the way we like it – is what much of this is about.

On the Cape Flats a group of 20 homeless women are building a house out of concrete blocks which they make using a hand press. Many of these women have lived in earth buildings in the rural areas and here in the city they

live in the recycled detritus of the consumer society; corrugated iron, flaps of old lino, bits and pieces of wood, old doors. Their interest now is to get in out of the rain .

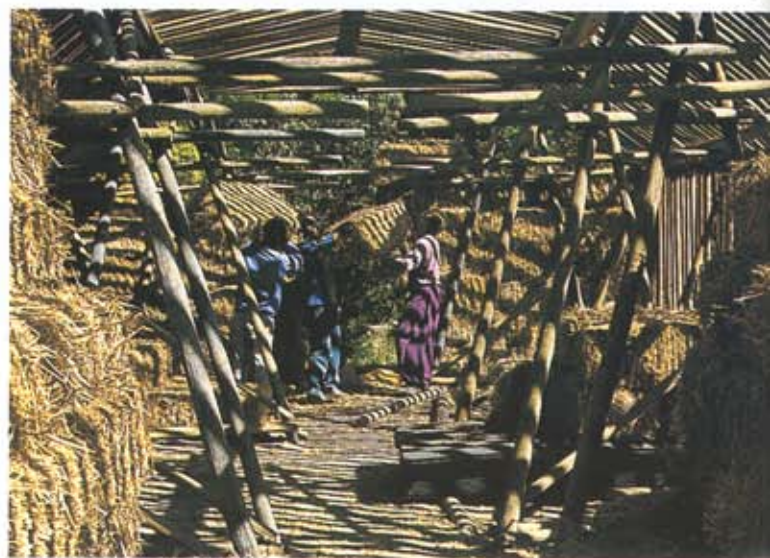
Out past Hermanus a young woman and her mother are building a house out of car tyres. The design makes use of cast-off junk – car tyres and aluminium cans – to build the walls of a house that will be entirely independent in terms of water, electricity, and sewerage. The house (the architect prefers to call it a vessel) is called an Earthship. It uses state of the art technology, orientation and building mass to capture

energy from the sun, store and then release it. As a closed system it recycles waste water to irrigate plants within its greenhouse zone. Once the initial investment is made the occupant can feel that their energy requirements place no further burden on the earth.

Etienne Bruwer, the architect for the first straw-bale house to be awarded a building permit in this country, is acutely aware of the environmental costs of the manufacture of the various building materials, cement for instance, yet for him the emphasis tends to be on the use of wholesome and simple materials not just for the planet's sake, but for one's own, (He will of course say they are the same) He

advocates the use of clay, a material that requires no energy input to qualify it for use, and straw, a by-product from farming that is in plentiful supply. There is something deeper here than 'energy used equals energy gained', some deeper purpose than addressing the biophysical needs of the planet.

According to archetypal psychologist, James Hillman, the Gaia hypothesis, (the notion of the earth as a living system,) is still too scientific, too rooted in the old physics, too focused on pathology. Duty, guilt and the fear of extinction, he says, are not enough to stir us to save the world. "Below the ecological crisis lies the deeper crisis of love, that our love has left the world. For love to return to the world,



Straw Bale House

The use of straw bales as a walling material originated in North America around the turn of the century with the advent of the baling machine. In the 90's there has been a major revival of the method with building codes for load bearing and non-loadbearing straw-bale walls adopted in several USA states including California. Over 400 straw-bale houses have built worldwide and their use is expanding rapidly. In South Africa, architect Etienne Bruwer has conducted his own tests into the performance of straw bales and is using them to build his own offices (pictured above) as well as houses for clients.

Bales vary in size but generally provide a wall that is about 40 cm thick. Because of their lightness and width, they usually do not need a foundation, only a base to keep them just off the ground out of permanent contact with water. Walls are constructed by stacking bales in offset layers much like bricks. Each layer is skewered to the layer

below with iron rods. At roof height bales are bound to the foundation with a top-plate which compresses the bales and serves as a wall plate for roof trusses. Lastly (sometimes even after moving in) the walls are plastered with clay.

Because of their highly compacted nature straw bales with plaster both sides have a fire resistance rating of over 2 hours. They are quick and easy to erect, cheap to build and even cheaper to live in (because they save cost of heating and cooling) durable (a 90 year old building is still in use) they use an underutilised resource, they are not susceptible to vermin (straw is almost entirely non-nutritive cellulose) and they are great insulation – three to ten times better than standard constructions. All they ask is to be kept out of a permanently moist environment until plastered.

For information: Etienne Bruwer of Greenhaus Associates, Architect;
Telephone: (021) 762 0965; Fax: (021) 762 0966 USA Energy Efficiency and Renewable
Energy Clearinghouse (EREC) : email: doe.erec@nclinc.com

beauty must first return, else we love the world only as a moral duty" And why 'beauty', that desperately out-of-favour word? Because out of it springs "a desire for the world which affords the vitality, the passionate interest on which all other efforts rest. We want the world", he says, "because it is beautiful, for its sounds and smells and textures, the sensate presence of the world as body".

For Bruwer, there are major benefits to the person who lives in a 'natural' house, who participates in its building, whose hand has helped to shape it. In most modern houses, he says, we are insulated from the earth by petrochemical water barriers, from the air by walls that do not 'breathe,'

Low cost straw-bale house

According to Architect, Etienne Bruwer a 400 thick wall of straw-bales finished with lime-sand plaster that will keep a house comfortably warm in winter and cool in summer can be built at a lower cost than a 190 thick plastered concrete-block wall – and with less labour input.

Each straw-bale costs about R4 to buy compared to about R5 for the materials for five concrete blocks that would give an equivalent face area – and then the blocks still need to be made. The straw-bales would be erected much faster because they are lighter and no mortar is required. An in-ground foundation is not required though the straw-bales do need to be separated from ground moisture. The straw-bale wall will provide insulation that is at least fifteen times more effective than a concrete-block wall. (A190 concrete block wall plastered both sides has a R value of about 3. A straw-bale wall plastered both sides has an R value of 43 to 57, depending on the size and density of the bale) The savings in energy needed to heat the house in winter and to keep food cool in summer and the contribution to the comfort of the householders is obvious. According to Bruwer, the noise-isolating and sound-absorbing properties of thick straw-bale walls are another major factor that should lead to use of this system, particularly in situations where large numbers of people occupy small homes or where homes are sited close to each other.

*For information: Etienne Bruwer of Greenhaus Associates, Architects.
Telephone: (021) 762 0965 Fax: (021) 762 0966*

from natural fields of energy by synthetics. Until, for instance, we spend a night under a thatched roof instead of a metal roof with a layer of coated sisalation, glass fibre insulation and a ceiling coated with a plastic paint, we do not know what it is to sleep breathing air that is 'alive' and then, when we do, because we don't know how to 'scientifically' quantify it, we ignore it in the house that we build.

The return to the simple, to the elemental, in building therefore is a force that springs not just from weighing the cost benefits (is it good or bad for the earth?) but from the very deepest need of our psyche. For our own health, not just for the planet.

What has this to do with the issue of 'green' versus 'development' thinking in this country, the question of saving the earth or saving the baby, the notion that clay is an indulgence for those who have too much and concrete block a necessity for those who have too little?

It seems to me that, as these two ships slide past each other, those who are getting out of the rain and those who are getting into the mud, there is the opportunity for dialogue, for synergy, for community. At the deeper level, they are not two ships but one. They are moved, if we are to use Hillman's terminology, by the same force, by the face of beauty, the attraction to which is called love. And if the beauty is in the world, in the *body* of the world (and that includes those who live on it,) then we are all on common ground whether we use concrete blocks and carry our child on our back, or pile mud on walls and drive the child to school.

Only Hillman's definition binds these two groups. Between the person who is building the mud house, who uses a motor vehicle to get to work and the woman pressing concrete blocks who does not have and probably never will have a car, and who lives in a world of recycled goods, who is it that is being 'green' and can one even make the distinction? For one reason or another, all these people are participating in the building of their own houses with their own hands. Saving money is one reason. Hillman would say it is because the world's beauty calls.

A love of the world, of its air and sun, "the sensate presence of the world as body" (it's beauty in other words) is

what he says will keep us safe. A love of power or control, of dominance, of accumulation of money, of prestige, a condition which Hillman says arises wherever the world's beauty does not call and one turns ones love inwards, is what in the end separates us and might well send us over the edge.

There was a full page statement in one of our newspapers in that fraught but vivid time before the elections that described us as "a people united in our love for this beautiful land". We had no country then, no leaders, no institutions so we had reverted to what is most enduring, most simple,

and which touches us at the very deepest level, the earth. To read that was to know that one was both at home here and in community. It seems to me that the people who are building their mud houses, their straw-bale houses, their 'Earthships' and the women of the savings club with their concrete block houses are, whether they know it or not, all joined in the same endeavour borne out of love for the body of the world.

Quotations from *The Practice of Beauty* by James Hillman (*Sphinx vol. 1 1989*.)



Cob House

Cob walling is a technique for building walls out of mud and straw by hand without moulds or shuttering. It is a simple and yet highly effective form of building. It requires hardly any investment in equipment and the skills are easily learned by almost anyone.

The walls are built out of a mixture of clay, straw sand and water. These are mixed and worked in together, usually with one's bare feet, and then packed on course by course by hand and worked in with a simple tool. The walls are then plastered with a mix of clay, sand and finely chopped straw – white flour is added to the final internal coat.

It is a method of building that has been in use since earliest times and there are cob wall buildings in Great Britain of great antiquity. It is essential to have dry foundations and good roof protection.

A wall of clay and straw retains only about 4% moisture compare with a concrete block's 25%. In other words, the wall breathes. For Herta, (pictured above) the act of moulding the

wall with her hands imparts something to the wall that will continue to resonate for her when she moves into her 48m² house. Using her and her son's labour, building costs have so far been negligible. The clay comes off the land and dead gum trees have provided the building timbers. Recycled car windows and broken plate glass are cobbled directly into the 30 to 45 cm thick walls. The floor will be mud, again with sand and chopped straw.

Herta and her son Jan Sturman (who trained in USA) will be giving workshops in cob-walling techniques for 'architects and like minded people'.

For information: Herta Sturman: Tel/fax: (021) 887 4047
Architect Etienne Bruwer has been monitoring the progress of this project with a group of students from the School of Architecture at the University of Cape Town.
Telephone: (021) 762 0965 Fax: (021) 762 0966
Internet: <http://www.teleport.com/~sparking/cob/door.html>



Concrete-block house

This is one of 150 houses being built by the women members of a community savings scheme on the Cape Flats. Rather than wait for the housing subsidy and being ineligible for bank loans a group of shack dwellers (mostly women but a few men,) started a saving club, acquired some land and began building houses for themselves with the aid of overseas funders. Minimal technical support is provided by architects in an affiliated organisation called People's Dialogue.

The external walls of the houses are of 190 mm thick hollow core concrete blocks manufactured on site by the women. The basic house, from the start of foundation work, is completed in two weeks. The women work in a teams. The house owner is usually part of the team that builds her house. Training is given by those already experienced. Women from other saving schemes also come to receive training and contribute their labour as others will contribute theirs to them when they come to build their own house. In this way strong community bonds are built as well as links with other communities. For these women there is immense satisfaction in initiating the building of their houses without waiting for the the flow of government subsidy nor even the provision of local services.

Houses vary in size from 56m² to 70m² They can get into their house for R7500 to R9000 – around half of what they would have to pay for a similar house purchased from a developer. Plastering, a ceiling, even the concrete floor, can be done afterwards. The additional construction costs to provide roads, water, sewerage to each house amounts to R6,300 which will come out of the R15,000 government subsidy.

Priorities have been to achieve maximum size at the lowest cost. A single skin of concrete blocks has been used but the insulative quality is poor and condensation on the inside face is an inevitable consequence. There will be an ongoing cost of keeping the house warm in cold weather.

For information: Patricia Matolengwe, Victoria Mxenge Housing Association, (Part of the SA Homeless People's Federation); Telephone: (021) 314 687 Fax (021) 314 685.

The Earthship

The Earthship concept was developed by architect, Michael Reynolds of New Mexico, USA. He describes it as "a heavy duty solar heated and naturally cooled shelter that comes with all of its own utilities". Reynolds has been making houses out of tyres for the last 25 years. The walls of an Earthship are made of car tyres laid on flat which are then filled with earth and compacted. Because of the width there is usually no need for a foundation. The walls are built in a series of U's. Skills for building these walls are easily acquired and the work is often done by the house owners.

The Earthship is either half sunk into sloping ground or ground is beamed up against the back and sides of the U's so that backfilling takes place as one goes up. The insides and the exposed external faces of the U's are then plastered with mud using recycled aluminium cans for packing to smooth out the bumps and achieve a flat surface. The tread of the tyre forms a useful key. The walls act as an energy battery, storing heat from the sun for release in cold weather and absorbing heat from the rooms in hot weather.

The north face, where all services are located, is glazed in such a way as to allow maximum sun in winter and contains planter boxes into which waste water is recycled.

Plans, details and an instruction manual are provided to the owner/builder by the Earthship company. An integrated systems package can also be supplied that includes the solar power system, batteries, solar water heater with back-up gas demand heater and pressure tank. The cost of an Earthship is comparable to that of a conventional house, less of course the cost of labour that might be put into building it oneself. Thereafter, energy costs (water, power, sewerage rates) are of course nil.

For information: owner/builder, Yvonne and Angel Camp; telephone: 082 4911645; Internet: <http://www.taosnet.com/earthshp/>

