

The Case For Cob

(... and the 500 million houses, 2000-2010)

by Etienne Bruwer, Greenhaus Architects

The second Southern African Conference on Strategies for a Sustainable Built Environment, held in Pretoria at the end of August, brought together a wealth of information from practising professionals, academics, research institutions and non-government organisations. While a considerable share of the conference focused on sustainability in affordable housing, energy-expensive commercial building systems and their demands for artificial environmental controls were equally challenged.

Mike Rainbow from the international engineering firm Ove Arup pointed out that buildings consume an estimated 50% of the world's rapidly declining energy resources. He outlined some of the simple strategies that contribute to conserving energy usage — fundamentals of design such as orientation, insulation, shading and ventilation. More complex strategies which are engineered to make use of natural systems, such as solar energy, wind, rainwater and natural light, are also being used increasingly in buildings internationally. There is clearly a growing demand for alternative approaches to design and construction.

Architect Etienne Bruwer from the Cape Town based firm of Greenhaus Architects delivered a thought-provoking address on cob as a building material which has all the attributes for sustainability and more. His paper is presented here, complete with the questions and challenges it raises for anyone concerned with buildings and the built environment.

Towards the close of this conference and following on the erudition of the previous speakers who, as scientists and engineers, provided us with the fruits of their dispassionate analysis, allow me to nudge the agenda a tad, and perhaps also to add to the review and self-critique which we have begun to hear in the latter presentations.

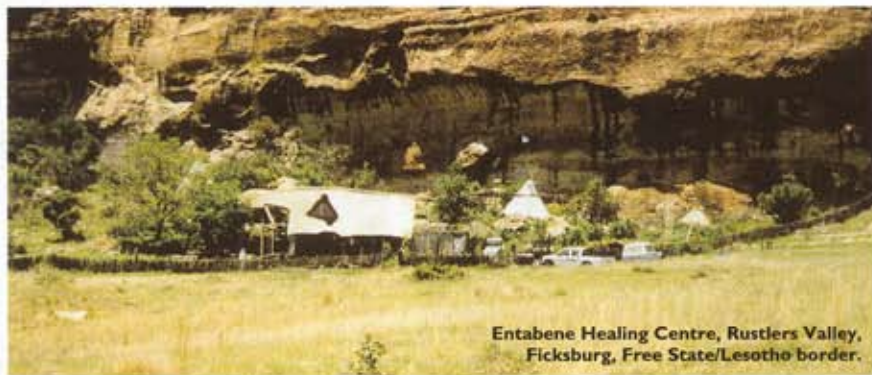
"The profession is changing greatly. I believe that there will be two types of architects ... the architect-artists, the Frank Lloyd Wright type architects, who will do smaller volume constructions, and the rest, the great industrial mass who will form the large superstudios. The individual architect, like the village doctor, will go away. As it so happens, having to admit to this at the age of 37 is very hard, because you will realize that perhaps you have chosen the wrong profession, or that it will be ridiculous to struggle to do things in a different way at all."

Thus, in February 1990, spake Mr

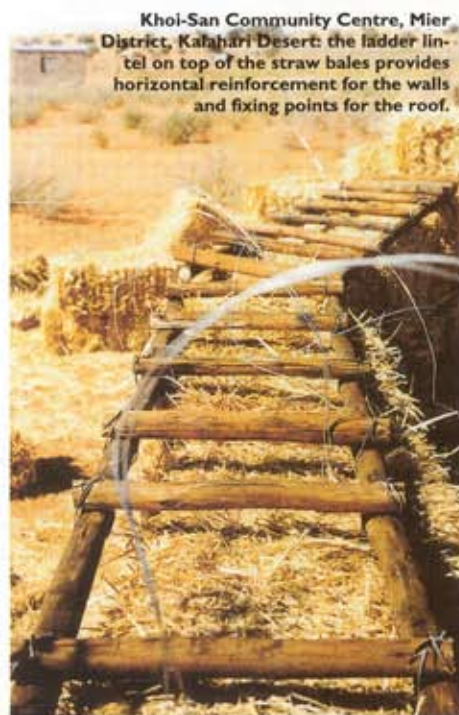
Santiago Calatrava, Spanish-born architect, practising in Zurich. A decade on, this is still, more or less, where we find ourselves as a profession, with perhaps one notable change in course — "doing things in a different way" has a decidedly greener hue than Mr Calatrava may have envisaged in 1990.

Since that time, many green conferences — the Rio summit, Agenda 21 etc. — have collectively shifted all things green much closer to the epicentres of debate and the decision-making process. In addition, eco-watching and highly visible activism have had profound effects — from Exxon Valdez to Chernobyl to Muroua to Kutsch, there are ever fewer places to hide — and politics are more and more 'made of this' — what with Greens even holding the balance of power in some cases.

Here in South Africa too, our purview has shifted; prompted by vast social change, matters have taken a new course. The awak-



Entabene Healing Centre, Rustlers Valley, Ficksburg, Free State/Lesotho border.



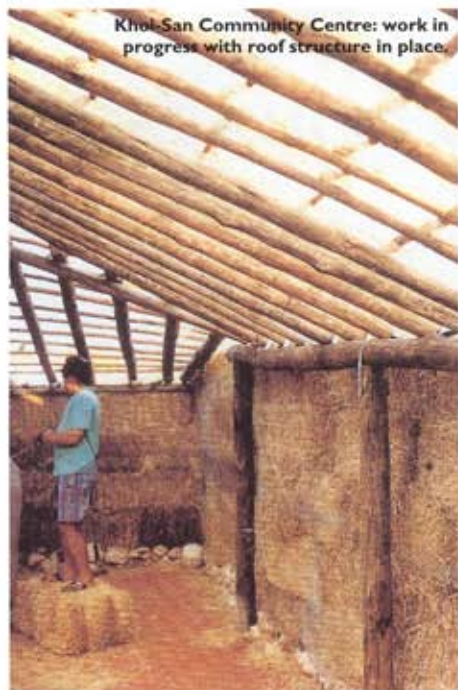
Khoi-San Community Centre, Mier District, Kalahari Desert: the ladder lintel on top of the straw bales provides horizontal reinforcement for the walls and fixing points for the roof.

ening to green issues has *inter alia* been fostered by constitutional developments, and mostly, whilst lagging behind that of our Euro-counterparts, this awareness has developed in a healthy way, inasmuch as it has been contextualised better, within view of the central issue, that of social transformation.

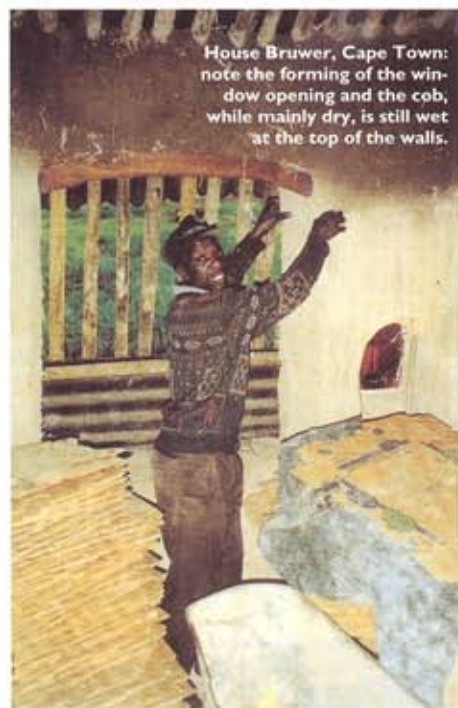
We now know more about our constitutional rights, those of the unborn, the young, and the trees and the remaining forests, and a groundswell of new perspectives defining 'relevance' now has shifted consciousness and action into a different, greener gear.

It was at the other end of this continent, 2 300 years ago, that Aristotle said to the young and conquering Alexander, that it would be as difficult to organize peace as it would be to win wars ... As far as the built environment and professional involvement with it are concerned, much good will only 'happen' through the pro-activity of the practitioners; it cannot come to pass unless we all 'own' it; by definition it exists only in wholeness ...

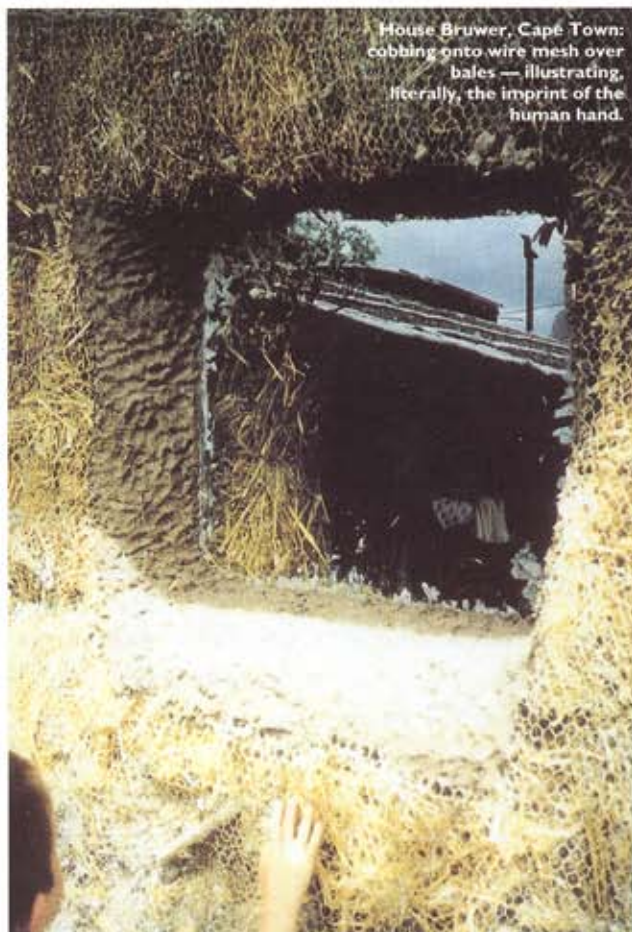
As citizens and architects alike, we find



Khol-San Community Centre: work in progress with roof structure in place.



House Bruwer, Cape Town: note the forming of the window opening and the cob, while mainly dry, is still wet at the top of the walls.



House Bruwer, Cape Town: cobbing onto wire mesh over bales — illustrating, literally, the imprint of the human hand.

ourselves shuttling about in a fruit salad of theme parks — Suburban, Corporate, or (in the most vulgar kind, those made for the single shared sacrament of) Shopping — where architects either have become purveyors of designer filing cabinets on main street, the sick-building syndrome counting-houses for profit/inflation/ (and less disclosed) loss, or, on the other hand, have escaped or reacted and retreated to the margins, to sit in the electronically rigged security-fenced suburb or in the ungreened, unsustainable (but much friendlier and more socially vibrant) township; a choice between two post-apartheid cultures, each characterized by its own brands of entitlement and disengagement.

As the 'architects of aspiration wars', we are either helping the 'haves' to surpass further their present extent of ownership, or, against seriously stacked and structured odds, trying to facilitate in the (justifiably resentful) 'have-not' survivor-communities the very

development which we know can only ultimately 'come from within' ... 'Life' happens somewhere in between.

BACK TO BUSINESS

Although we will look briefly at the properties and virtually universal value of cob as a building material — why it is so wonderfully affordable, so green, so perfectly lifecycle-plannable — I believe, in South Africa at least, it is in its potential role in the sphere of social ecology, and the transformation to sustainable practices required now, that cob holds a key. With respect, it is indeed this aspect, the central role of human action and aspiration, which I have found so conspicuously absent from much of what we have entertained in our green fora over the last years.

It is also on this score, the social agency function of South African professionals concerning themselves with the making of the manmade environment, that I have felt some concern.

When we face up to the underlying issues, the real drivers, which are surely: burning ambition for betterment and a longing for *ubuntu*/participation/belonging — and given also the oft-antithetical nature of these two motivations — we will be measured by how well we meet and channel the frustrated energies of our short-changed communities — now maybe some 8 million able sets of idle hands strong.

BUILDING COMMUNITY IS COMMUNITY BUILDING

We will do well to be reminded that it is only in the last century and a half that we 'kinda lost it'. In older more culturally homogenous regions and in all the new mestizo cultures

like our own, South America, Australia, the Philippines, and Indochina, our detachment and consequent modern consumerist madness set in when we lost communal place-making as a universal prerequisite to community building.

Until relatively recently, when we all were less nomadic, more 'propinquitous', we owned the public realm, insofar as each of us found a part of ourselves out there — not only because buildings were made in the image of Man rather than in the image of the machines, but because, most likely, we partook in its making in some form or another.

It is the readable presence of the human hand, evidenced in shared place-making, that still characterizes 'living' environments, especially in city precincts older than 100 years. We experience belonging through being identified in or with something bigger than our individual selves. In

contradistinction to this, today the making and maintaining of the stuff in the buildings entail much more than the housing of it. Having valued our slave-machines, our appliances and private mobility in both workplace and place of dwelling over all else — our 'disowning' of this process of 'making the world' has led us to our current detachment and dependency, away from any sense of belonging or real choice.

We have reduced both participation and betterment to 'Having Stuff'. Houses 'Have Security', Unquestioning Workers 'Have Money', One-stop Shopping Malls 'Have Everything' and Other Kids 'Have More Than'. 'Have' culture invests ever more in convincing the 'Have-nots' that 'Having' will equalize and make everything and everyone okay. Apartheid culture exacerbated this by divesting responsibility for the whole from the segregated individual.

SO WHY AND WHAT IS COB?

In some form or another, it is the most widely used earth construction method. The material consists of one-fifth clay, four-fifths soil, reinforced with plant fibre (usually grasses or straw — the non-food fibrous remains of grain production). It is mixed together underfoot and is either applied by hand directly onto walls, or into formwork or shuttering, or formed into bricks. It is the stuff of which a third of the world's architecture — from Europe to the Americas to China to Africa — is made.

WHAT DOES IT COST?

In South Africa, 2000:
2 rooms, 18 m² in area, @ R 400 (US\$ 56) per m², cost about R7 000 (US\$ 1 000).

7 rooms, 72 m² in area, @ R 310 (US\$ 46) per m², cost about R22 000 (US\$ 3 000).

These total figures constitute 45% materials to 55% labour. They would include a basic roof, timber joinery and finishes and exclude plumbing and electrics, which would be the same as for conventional industrially-sourced housing. The walls and floor represent a third of the cost — about R125 or US\$18 per m².

WHAT DOES THIS MEAN IN THE LOCAL CONTEXT?

In terms of the current housing subsidy (which is to disappear as such, we are told), this would translate into a 60m² house, an income for an owner and two trainee assistants at the going labour rate of say R85 per day (US\$12) over 21 working days — a working month.

Most importantly, however, in building a cob house, the owner:

- will have had the empowering experience and dignity-restoring personal transformation of actually 'making (my) place in the world', determining his or her own environment and 'owning a part of the world', in the real deeper *ubuntu* sense of being/belonging/owning;
- will have acquired a marketable skill;
- would have imparted the same skill and confidence, plus a living wage for a month, to two more of the 8 million sets of hands;
- would have contributed to real place-making.

The appreciable difference between this living process and 'housing procurement' — which reduces the individual to being a unit, a consumer of a good which has been kicked up and 'sold' through a disposal process, much like a car or an appliance would be — will be evident in the benefits.

WHAT ARE THE BENEFITS?

These are as much social as environmental as economic, because they are one whole. Building community is community building.

In old English we encounter the word 'byldan', root word for both 'to be' and 'to build'. One can indeed say that these two fundamentals are one, or 'in one'.

Building with cob is: educational and intergenerational; empowering and self-determining; cost-effective and it uses 'labour' in an ennobling manner — you work for yourself or with a view to building for yourself. It favours innovation, encouraging doing over buying; devolves control and responsibility to the owner, and presents an opportunity for self-expression and individual initiative.

Cob structures are highly adaptable and extendible. Cob has an unlimited lifespan, is totally recyclable, without waste and transformable. It is enormously health-giving — it reduces sound pollution, extracts toxins from the atmosphere and is a perfect thermal mass medium. Cob honours the first common-sense principle of green building: use what is at hand — it lies under your feet, on your own site, and does not require mechanical transport. In any maintenance required, the same on-site material is used, by on-site

labour, rather than buying in thermoplastics which do not breathe and often are prone to UV decay, pollute the environment, and are not biodegradable.

Building with cob happens best when it is community driven — like the house-raising and barn-raising of most buildings until the 19th Century. It creates skills banks and goodwill through labour barter and skills exchange.

Building with cob always makes for innovation and retains the essential quality of a

humanized environment — the evidence of the human hand and human heart — a longing of all who have ever not belonged. Many, most, still do not. ■

Handbooks on building with cob and straw bales are available from Greenhaus Architects.

For additional information see: Architechnology October 1999 — A brief guide to Building with Cob, by Keith Lurie, and sister publication Urban Green File Sept/Oct 1998 — Building with Straw Bales, by Carol Knoll.



Credit: Andy Horn @ Eco Design



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