The Fore Cast

Mark West

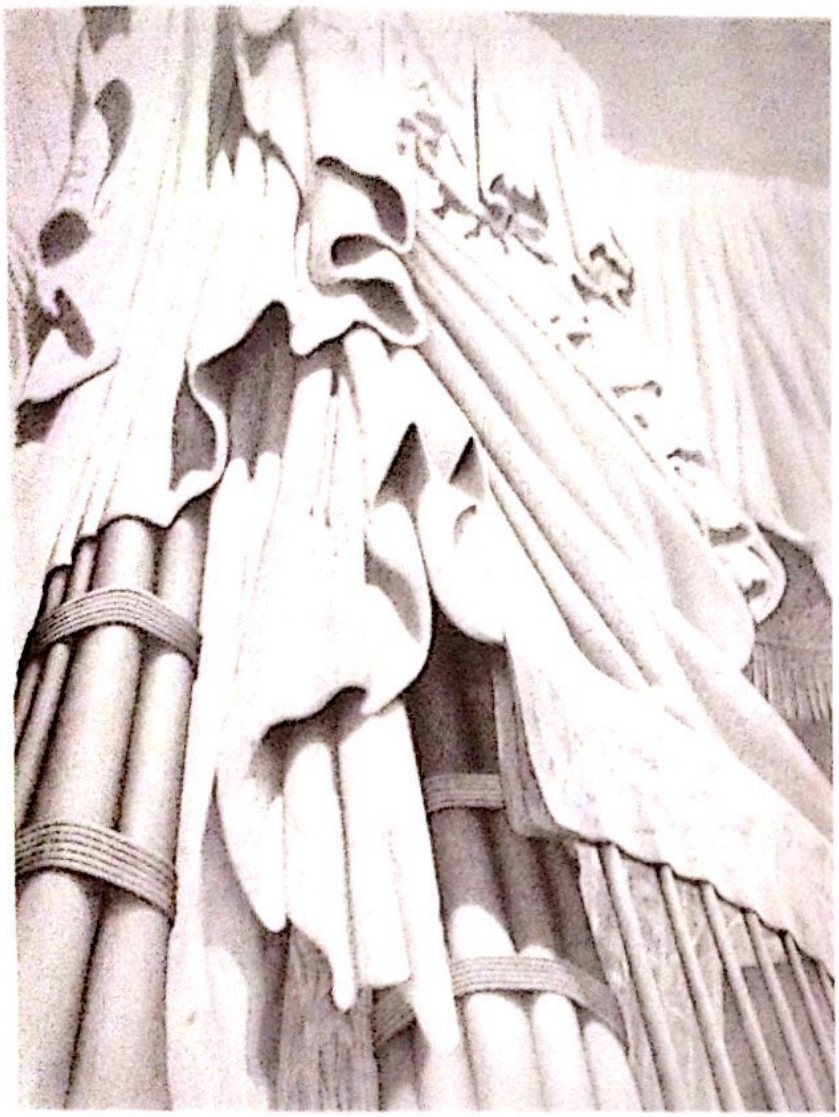
Using fabric as a flexible and malleable restraint, Mark West makes extraordinary concrete structures at the Centre for Architectural Structures and Technology at the University of Manitoba. His work is admired by designers, engineers, builders and academics, for its originality, rigour, efficiency and beauty. It has influenced a generation of followers across the world who are inspired by the vast potential his methods have unleashed. Central to his work is the act of speculative and inquisitive drawing. Here he retraces the evolution of his work from its earliest steps, and reviews as much as recounts, how the site and practice of drawing is an integral act in the excavation and search for ideas.

This is a story about the spontaneous eruption of Form, and about techniques for finding the unexpected in the ordinary. It is also a story about how creations in disparate scales, modes and materials can inform each other as an intertwined and linked series of subtle and unforeseen prototypes. This is only a small story, and includes merely a few ways in which such things can happen, but the story may be interesting for restless makers, struggling with the confines of Habit.

Near the end of this story, we find techniques for forming reinforced concrete, freed from the confines of prismatic mould-making. Many techniques have been found for casting wet concrete in flexible fabric moulds, where the materials themselves flexibly negotiate their final form within the gravitational field.[1] In this flexible regime of building, certain boundary conditions are rigidly fixed – for example, the locations and dimensions of edges, or maximum/minimum depths, and so on. The fabric membrane, held to these fixed boundaries, is then left to its own devices to negotiate a precise geometry of stasis between these fixed points and edges while it holds its wet load. The results are a combination of preconceived control and uncontrolled (immaculate) natural events. This way of building runs counter to several deep traditions of architecture, engineering and industrialised construction, yet without surrendering the simplicity and logic that these linked enterprises demand. But all this is near the end of the story, and lest we get too far ahead of ourselves, we must go back to a proper beginning.

Blackout Drawings

This method of building which forgoes forms of rigid control was arrived at by a curious path, more or less unconscious of its own direction. The scent of this trail was picked up through a series of aberrant drawings begun in the early 1980s. Unlike conventional architectural drawings, these have nothing to do with conveying the visual likenesses of anything. In fact, strictly speaking, they are not visual things at all, but rather analogues for a *kind of action* that spontaneously produces unexpected Form.



Thin shell, spray-concrete 'Curtain Wall' from a hanging fabric mould, 2007
© Mark West

After a long series of photo collages (a venerable weapon for surprise attacks on the citadel of habit), a method of drawing emerged that takes explicit action on habitual perception. These 'Blackout' drawings start with a photograph or photo collage that is selectively and systematically 'blacked-out' using a soft graphite pencil. The game is to remove the recognisable bits from the photographic reality until some other figure(s) spontaneously emerge to vision. So, for example, faces, hands, or anything else that insists on naming itself, must be removed first. By cutting the moorings to their names, perception is set adrift. In this unnamed indeterminate state, emergent figures will spontaneously appear to vision inside the photographic 'reality', exactly as they do when we stare into clouds, and exactly as Leonardo proposes in his 'Advice to a Young Painter'[2] to stare with similar intent at a stained wall. The figures that appear are then clarified by 'blacking out' the now extraneous portions of the photograph that 'are not them'. This is a game of systematic visual forgetting, an induced amnesia, a renunciation of the already named and recognisable in favour of surprising, unexpected and *nameless* figures and spaces that seemingly arrive of their own free will.

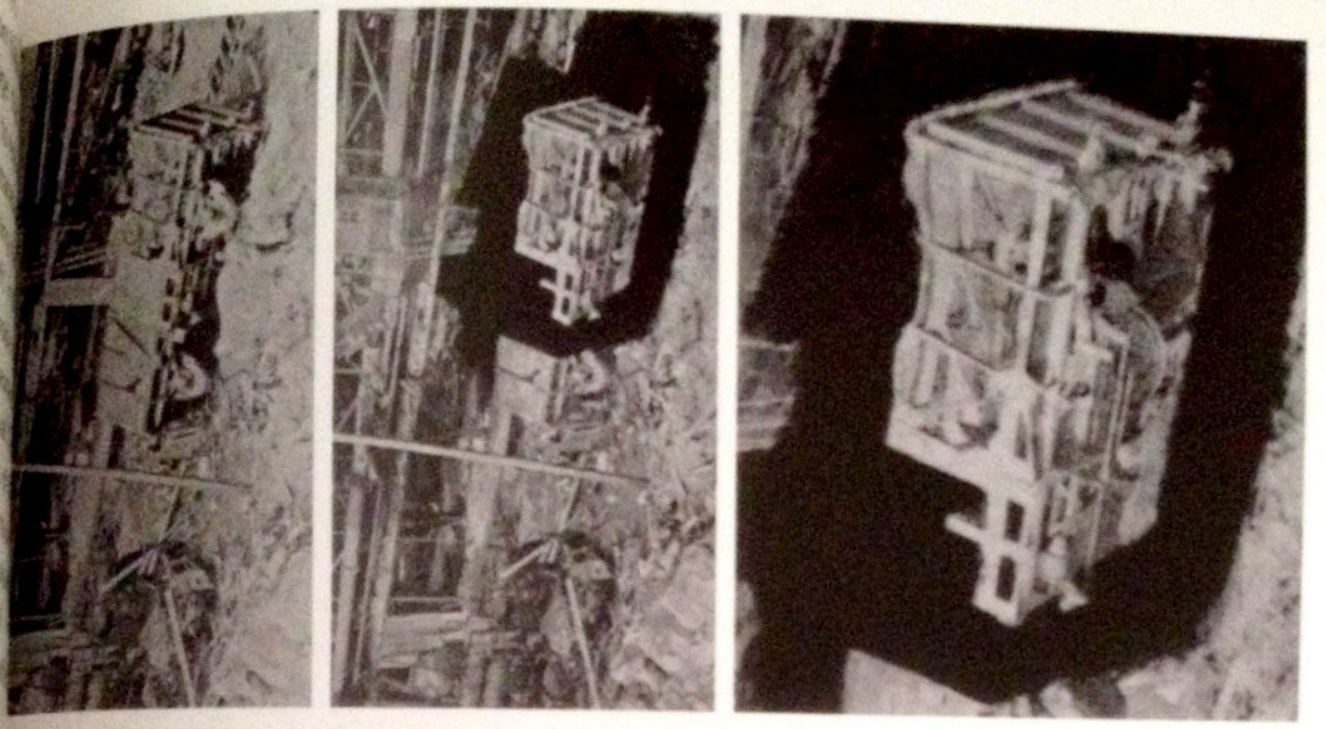
These drawings were an explicit attack on habitual perception, that abiding, steadfast and unshakable enemy of *seeing*. All the works described here represent different attempts to find ways of making that might lift the veil of habit and reawaken direct perception. Of course, one can do this temporarily through novelty, but novel things are an entertainment and, like a drug, wear off quickly, demanding constant replacements with the next and the next new thing. What I wish to describe here is something altogether different from novelty; these are ways to surprise perception through understanding and handling Matter as something *alive*. To clarify what I mean by 'alive' we must take a brief detour into some novel and provocative physical theories.

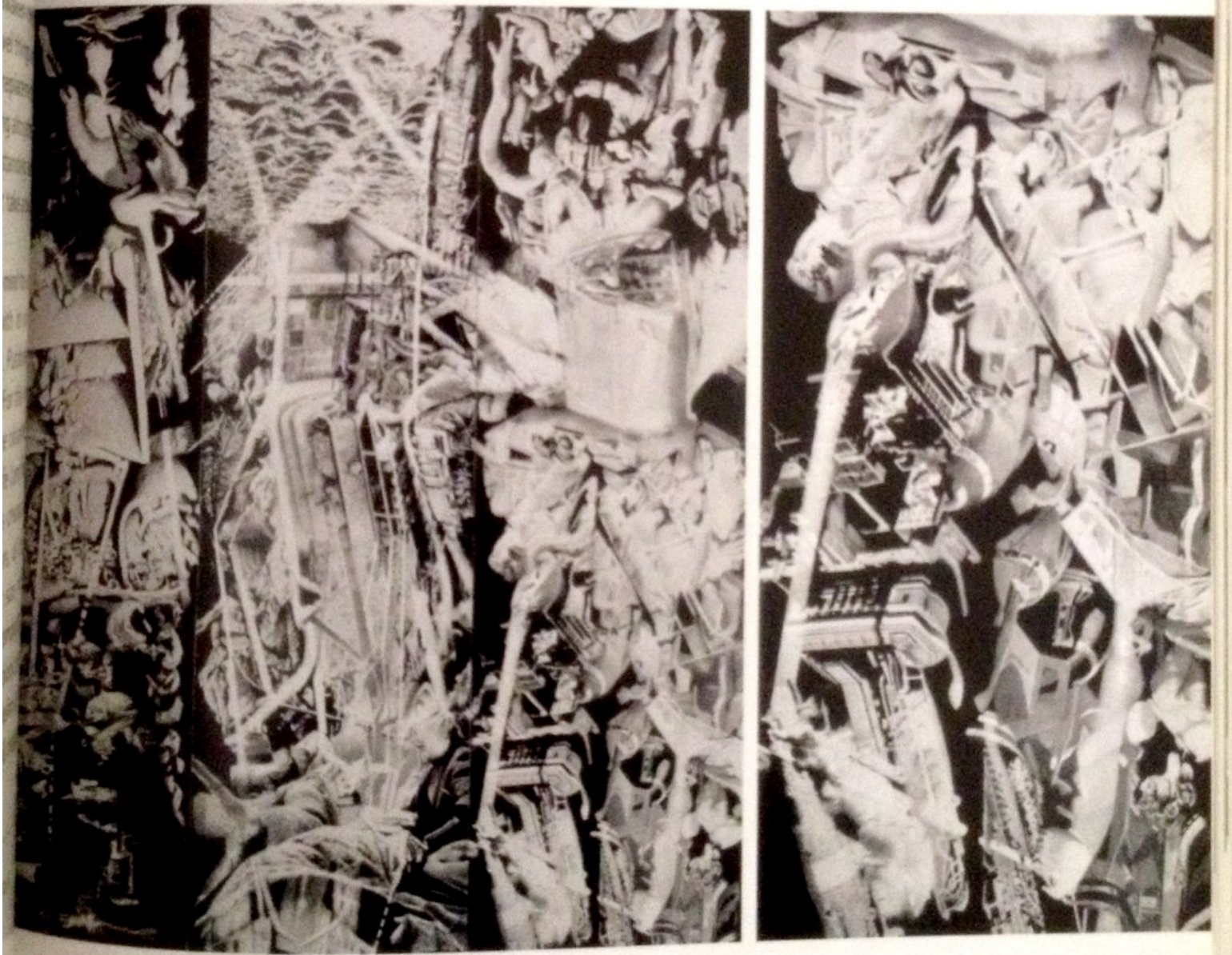
Understanding all matter as 'living' is, in part, a game. It is a trick of the mind to see a 'dead' material (graphite or concrete, for instance) come alive, restless with its own desires and will-to-form or form-fate. But it is not simply a game of pretend. Putatively 'dead' matter can be understood in an entirely objective sense as truly alive. For this we can refer to the ferocious empiricism of Teilhard de Chardin's physics, where he observes that all matter is everywhere prodigiously active, organised as a kind of protolife (and for Chardin, a protoconsciousness).[3] The truth of this is seen every day in matter's chemical restlessness: the rusting of iron, the peeling of paint, the decanting of odours, all the result of restless and incessant material (molecular) action, though usually at size and timescales far different from our own. Further empirical support is given by contemporary energy flow ecologists who explicitly distinguish between biotic life and non-biotic (or pre-biotic) life.[4] This larger embrace of what constitutes life is based on a broad definition that sees life as the 'negentropic'[5] flow of energy. From this frame of reference, all matter self-organised against entropy is a form of life, biotic or otherwise.

---

top. Anatomy of a Blackout drawing – what is found inside photographic 'reality'. © Mark West.

bottom. (left) Large Blackout drawing, *Everything Falls*, made from collaged photographs. (right) An enlarged portion of this drawing, 1984. © Mark West.





Blackout drawing (detail), 1983. © Mark West.

But let us return to acts of drawing and making. When I found the Blackout method nearly 30 years ago I was filled with an intense youthful euphoria. I felt I had fallen into a deep discovery, something with heavy implications I did not understand, but could only intuit. I drew incessantly, finding ways to eventually free myself of the photographic 'canvas' as a starting point, yet keeping the hallucinatory/amnesic method of production. A long series of 'free' graphite drawings followed, done on blank paper using various versions of collage and Blackout techniques.

But despite their compelling pleasures, these were only images. As a builder I wanted to make actual things, not illusions. Furthermore, these particular images were useless as guides to construction. Despite their compelling realism, they were not descriptions of anything, but rather the found results of a specific kind of action, an action of self-formation. The signal value of the drawing technique was its extreme simplicity – these things almost literally make themselves. Their ease was a hallmark, a temptation. Were there other simple analogous actions suitable to making/finding *actual* things in the world?

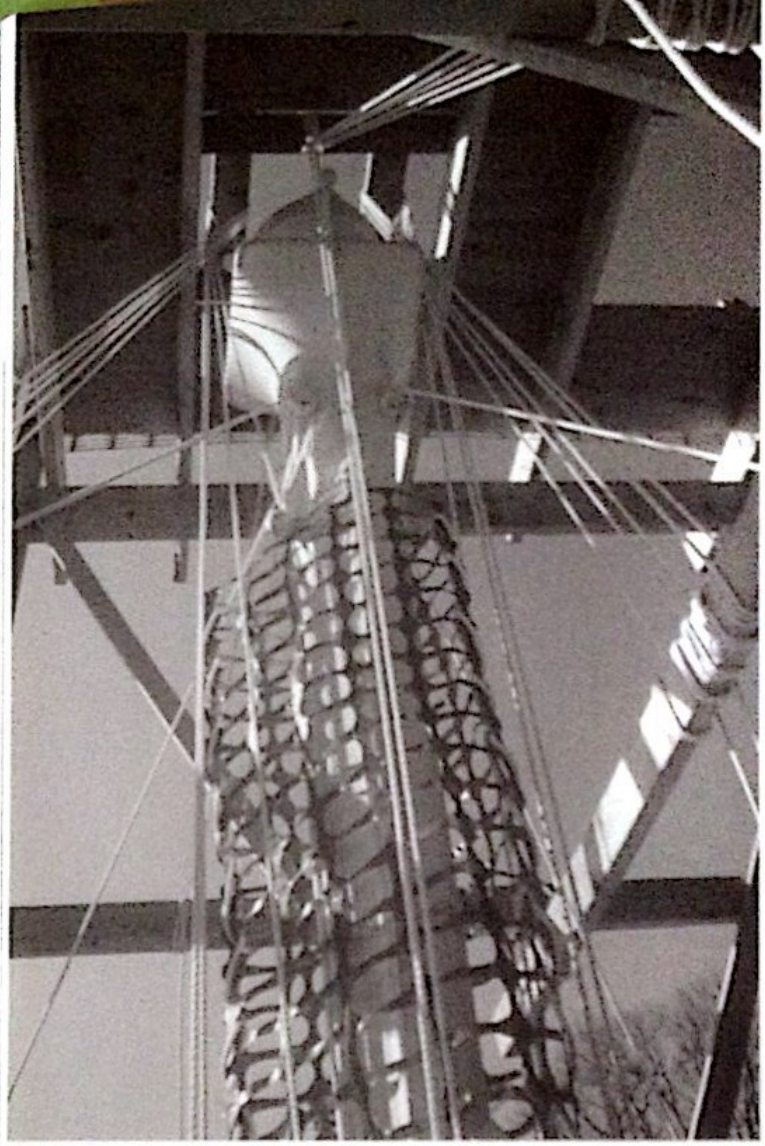
The answer to this question came from a sculptural practice that was explicitly aimed at taking the lessons of collage and the Blackout drawings as prototypes of action in construction. During this work I stumbled upon the trick of casting plaster in a thin flexible sheet which was subsequently redeployed in various ways over the years. The solid/fluid, soft/hard, wet/dry things that resulted were truly uncanny. Much like the illusory figures that spontaneously emerge from a Blackout drawing these were, in their own full-dimensional way, self-forming things – intricately defined figures that arrive with no assigned meaning. But unlike the figures that appear to us in clouds (or clouds of graphite), these forms were produced, or 'hallucinated', not by vision but by the materials themselves. Significantly, these objects arrived in full-dimensional material reality with the greatest of ease and, following a builder's intuition, were evidently capable of being built large if the small modelling materials were scaled up to tarpaulins and concrete.

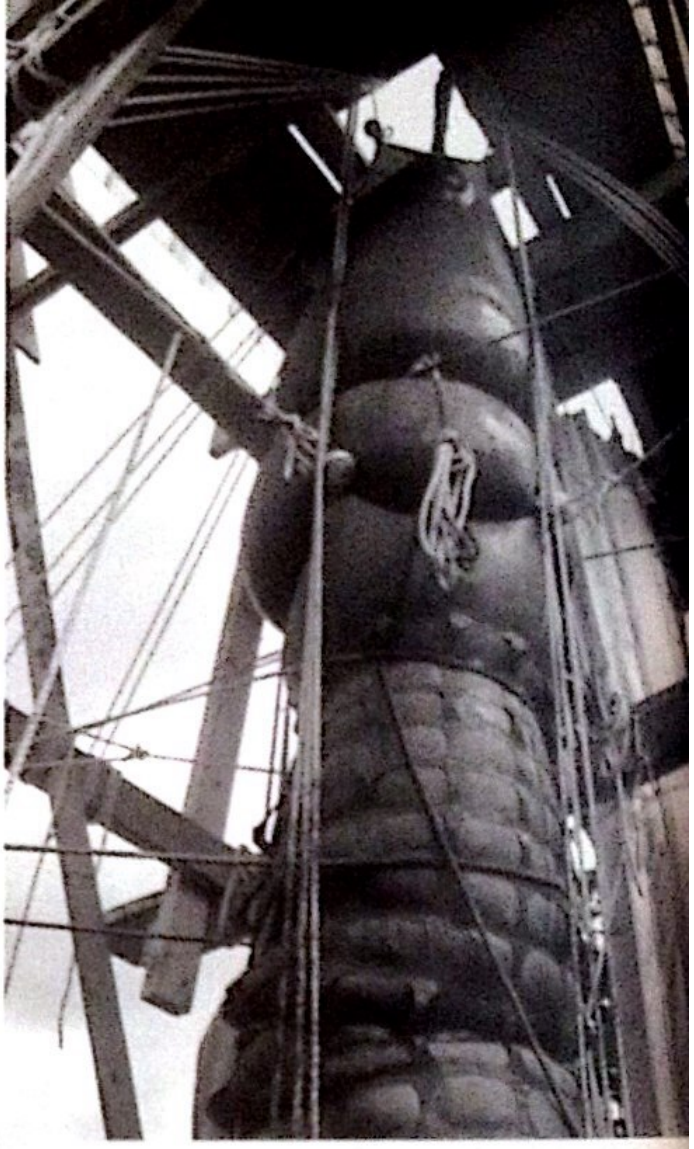
Self-Formation

When the work of scaling up these miniature self-forming casts began, I made a choice to limit the fabric membranes to flat sheets taken directly off the roll – no tailoring or cut patterns. This limitation was an overlay of a builder's sensibility (the imperative of simplicity) mapped on to the freedom of sculptural practice and its search for a particular state of mind.

While the simplicity of these constructions is assured by a reduction in means (flat sheets, simple tools and fasteners), the complexity of the results originates in the *self-forming* nature of the constructions. The final forms produced are found by the materials themselves through their own negotiations/struggles to reach a certain precise shape. In every case this is a singular and inevitable form – a kind of fate. The precise curvatures as well as all the details of buckled folds and stretch marks are calculated by the materials themselves to form the spatial trajectory of their own stability – a one to one, automatic, three-dimensional drawing of their mutual equilibrium state.

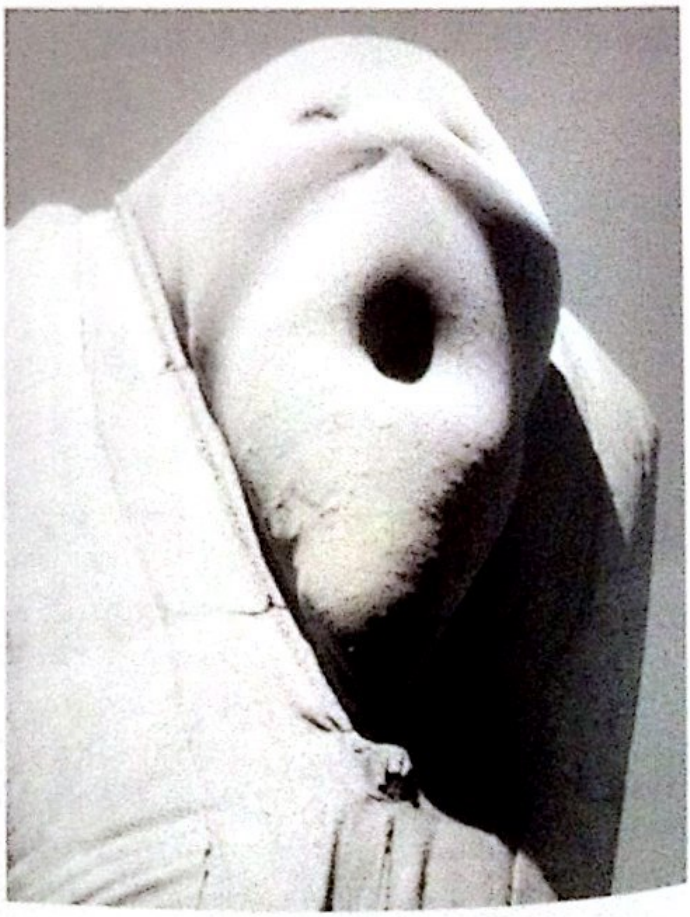
Of course, concrete and fabric do not spontaneously self-organise themselves. A builder's hand, attention and energy are all required to contrive these events, implicating a builder's will





top: Early experimental fabric column mould (left), filled with concrete (right).

right: Bar Harbor, Maine, 1990. © Mark West.



and craft in the process. But this goes without saying. The interesting part is not that craft is required to build these things, but rather that the most beautiful and intelligent bits take place *between* the controlled and crafted boundaries. In this case, the builder's deeper craft consists precisely in learning how and when to get out of the way, how to make a space of action in which the materials can self-organise their own shape of resistance unmolested by human will.

The Immediacy of the Thing

The beauty of these self-formed things, or the self-formed portions of these things, is striking. They are immediately recognisable as natural events rather than as designed form. As such they have a strange *time* about them that entwines their fluid (previous) and solid (current) states. Here are things that refuse to locate themselves in any time except for the moment of their creation which is *held* in an immaculate and permanent form. They may appear to be artefacts of some unknown ancient civilisation that flourished briefly, or something entirely new – some kind of science fiction perhaps? They refuse historic placement while the past of their moment of creation is permanently present. Like something from nature, they somehow remain permanently alive to perception.[6]

The Secretion of Meaning

This is a way of making results in things that are, to some extent, without direct intention. As when you find some realistic form inside a cloud, there is no sense of authorship to its discovery; it is simply 'there'. This lack of intentional authorship changes the basis of meaning found in these forms, freeing them from any semiotic structure; there is no pre-established code, no conceptual key to meaning. Things that arrive by natural processes 'represent' nothing but themselves in their suchness. In this case, perceived meaning erupts spontaneously through the *affect* produced by their presence. Percept displaces concept – or perhaps more accurately, perception *secretes* meaning without intending to.[7]

This kind of *found meaning* is prelinguistic, or nonlinguistic. It arrives unbidden, as in the presence of music, not through interpretation of a code but as a presence. And as with music, the fact that one cannot easily *say* what that meaning is does not in any way diminish the reality and immanence of what has been grasped. It occupies us with the force of an irrefutable argument devoid of language. It is not something one needs to get, but rather something that gets you. In this sense it is allied with and akin to Surrealism's attack on the heartland of intentionality. Do I overstate the case? Perhaps. In any event, an author's testimony should never be trusted – though in this case one's sense of authorship, as such, is nearly disabled.

A Hybrid Method

In the case of flexibly formed concrete, a definite sense of authorship is felt in the craft that is required: choosing the fabric, determining the boundary and support conditions, the connection details and, perhaps, the pre-stress (pre-stretching) of the fabric. Getting these things right is no different, in essence, from any other act of building, except for the fact that these are merely *preparations for an event* that will shape the construction

Fabric-formed column being unwrapped, Bar Harbor, Maine, 1990. © Mark West.

according to its own lights. Everything else that follows these preparations is determined by the materials themselves according to natural law. What emerges in the balance is a composite form of 'design' where wilful control and a surrender to natural events occur in the same space at the same time.

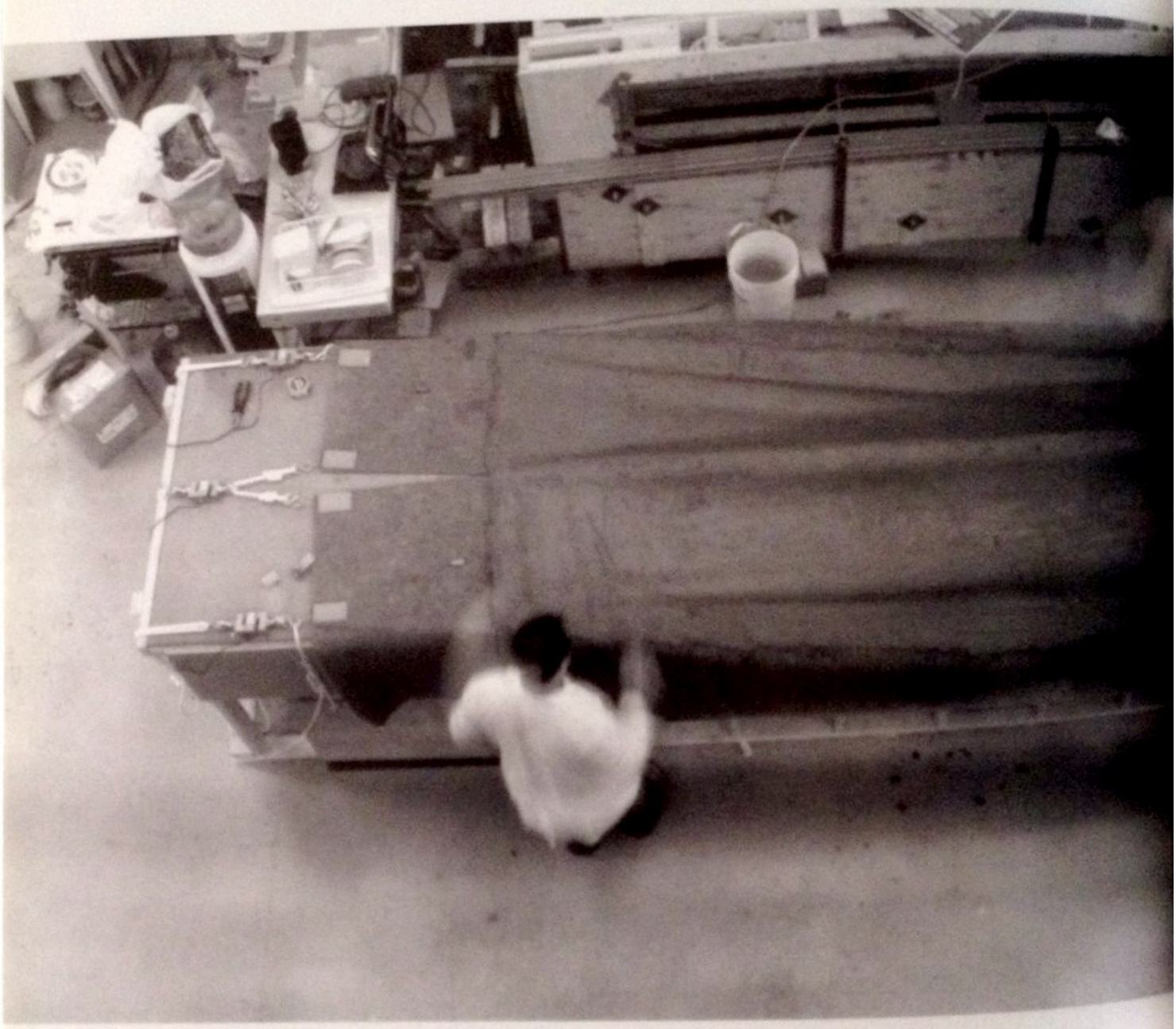
This hybrid methodology has proved to be extraordinarily fruitful. After more than 20 years of innumerable experiments, flat-sheet moulds are still revealing surprising new forms and possibilities, many of which are both beautiful and materially efficient. This unexpected and unreasonable fecundity suggests that within the simplicity and pragmatic constraints of this operation lies something deeper and quite a bit more complex. Here pragmatism does not serve the ends of convention or reduction, but on the contrary induces a kind of constructive metabolism that, as with all natural events, produces complexity as a consequence of extreme simplicity.

The Fore Cast

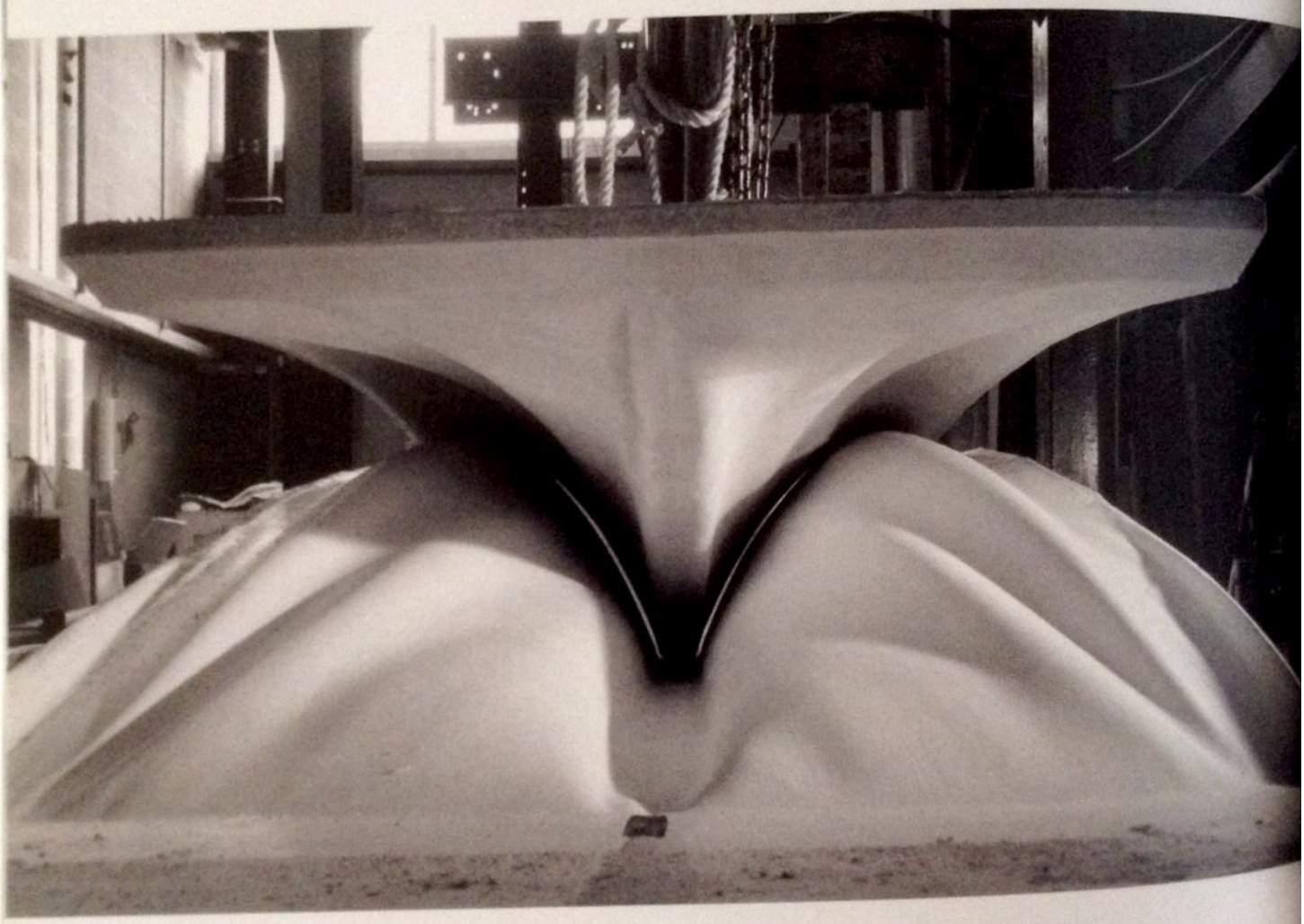
The work and research recounted here traces a linked series of retrospective 'prototypes', each one replaying a slightly different and more complex version of a similar search; each one a subtle prototype of action suitable to its own materials, size and complexity; each one producing a surprise of its own, and each one subsequently nested within the next incarnation/trial. To recount: this Chain began with Collage, turning into Blackouts, leading to free hallucinatory graphite drawings (early 1980s and onwards), followed by a free sculptural practice (late 1980s), reaching a kind of culmination in the first full-scale flexibly formed concrete structures (1989–92). The project of developing this new way of building has been ongoing since then. Having reached the point where a practical and economical building technology has been developed, one is tempted to start building – and indeed there is no reason not to. But what if the chain or web of linked prototypes is yet unfinished? What if the technical development of flexible moulds is a subtle prototype of action for something more complex again, something with more dimensions than a mere set of building components – another way of thinking about and doing architecture, for instance.

Returning once more to the physics of energy flow, we recall that every bit of matter, caught as it is with us in a temporal flux, plays out its own actions and exchange of energy in the world according to its own timescale and physical/chemical/atomic engagement with everything else around it. These behaviours are not the kind of behaviours mimicked by robotics, 'interactive' architecture, or so-called 'intelligent materials' which are, after all, focused on stimulating (or simulating) our own desires. These are, instead, behaviours innate to the materials themselves according to their own more-than-human[8] requirements, desires and fates. This is the life of the pre-biotic and post-biotic more-than-human world, the actions of the world from which we come, in which we are enmeshed, of which we are made, and into which we will return. When we build we enclose ourselves in another kind of living 'flesh', non-biotic, yet very much alive nevertheless.

Having found all this through these last subtle prototypes of concrete and steel, a series of questions comes to the fore: what if architecture were not made to be so strictly



A flat sheet of fabric, loaded with a thin layer of concrete, self-forms itself into a funicular compression-shell mould. CAST lab/studio, University of Manitoba, 2009. © Mark West.



Fabric-formed thin-shell mould and funicular compression thin-shell cast from this mould. The deep buckling-resistant 'corrugations', which are spontaneously formed along principal lines of tension stress in the fabric mould, provide buckling-resistant 'corrugations' in the compression shell cast from this mould. CAST lab/studio, University of Manitoba, 2009. © Mark West.

about *us*? What would life be like in architecture acutely alive to the events of its *own* existence, quite apart from the rhythm and scale of our lives? Is there an architecture that might assist us in our own living by pointing us not towards ourselves, and what we, we, we, want, want, want, but rather an architecture that helps turn our attention towards the more-than-human world and our role in it?

Notes

1 Fabric-formed concrete research is described at length elsewhere. See, for example: http://www.umanitoba.ca/faculties/architecture/cast/research/fabric_formwork/index.html and http://www.umanitoba.ca/faculties/architecture/cast/resources.html

2 Leonardo da Vinci in *A Way of Developing and Arousing the Mind to Various Inventions* in his '*Advice to a Young Painter*', teaches the following: 'I cannot forbear to mention ... a new device for study which, although it may seem but trivial and almost ludicrous, is nevertheless extremely useful in arousing the mind to various inventions. And this is, when you look at a wall spotted with stains, or with a mixture of stones, ... you may discover a resemblance to ... an endless variety of objects, which you could reduce to complete and well-drawn forms. And these appear on such walls confusedly, like the sound of bells in whose jangle you may find any name or word you choose to imagine.'

3 Teilhard de Chardin, *The Phenomenon of Man*, trans. Bernard Wall, Wm Collins Sons & Co Ltd (London) and Harper Row Publishers Inc (New York), 1959. Originally published as *Le Phénomène Humain*, Editions du Seuil (Paris), 1955.

4 The terms non-biotic or pre-biotic life are commonly used to describe the molecular/chemical foundations of biotic life. Biotic life is differentiated from pre-biotic life by the fact that it can self-reproduce and has memory (its DNA). See, for example, ED Schneider, JJ Kay, 'Order from Disorder: The Thermodynamics of Complexity in Biology', in Michael P Murphy, Luke AJ O'Neill (eds), *What is Life: The Next Fifty Years: Speculations on the Future of Biology*, Cambridge University Press (Cambridge), 1995, pp 161–72.

5 The usual direction of all molecular action is 'downwards' into less differentiated energy gradients, often referred to as disorder or chaos. This is the natural entropic 'flow' of the universe and, according to the second law of thermodynamics, the very foundation of time's one-way arrow. The prime exception to this inevitable flow towards greater entropy is biotic life, which assembles matter *against* entropy and toward greater differentiation, order and complexity, what physicist Erwin Schrodinger called 'negative entropy'. See Erwin Schrödinger, *What Is Life?* and *Mind and Matter*, Cambridge University Press (Cambridge) 1967, first published 1944.

6 Other things, over time, anaesthetise themselves and us, creating a somnambulist's world. The capital-D Design market is predicated on precisely this exhaustion of interest and the subsequent desire for the next and the next new and temporarily interesting thing. As Eric Hoffer has famously said: 'You can never get enough of what you don't really need.'

7 A central lesson of Surrealism.

8 I take the term more-than-human from David Abram, *The Spell of the Sensuous – Perception and Language in a More-Than-Human World*, Vintage Books (New York), 1996.