The Mimic, the Model and the Dupe

Mike Cooter

New Walk Museum, Leicester
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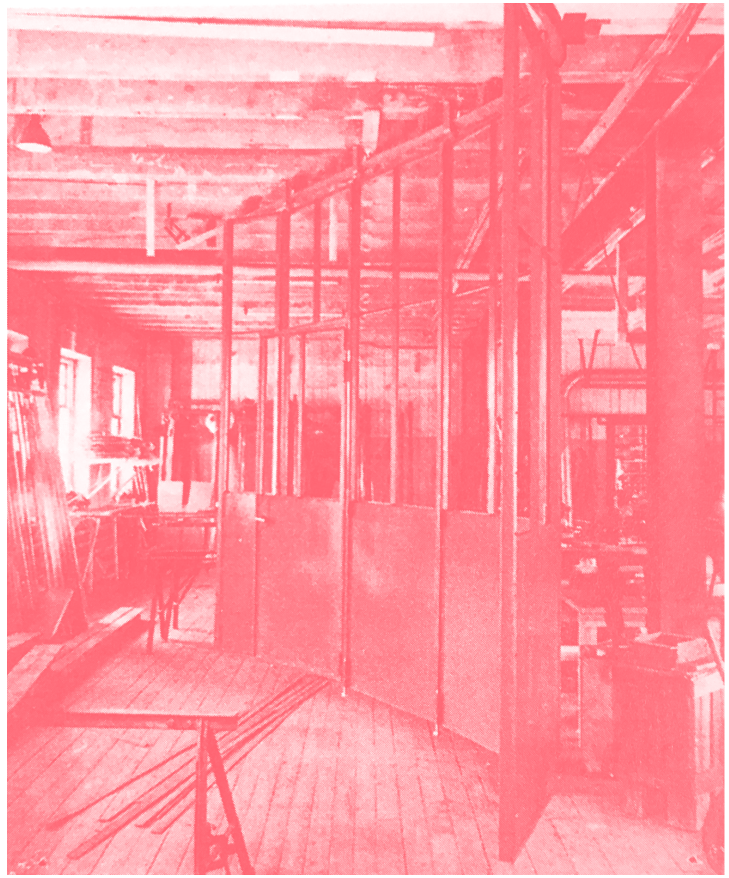
Eileen Gray, stool, c.1934
Eileen Gray by Caroline Constant, 2000.



The interior of the IDESTA workshop c.1950. IDESTA was owned and run by the Swedish architect Sigurd Lewerentz. 'A steel and glass partition has been set up for testing before delivery.' *Sigurd Lewerentz, architect* by Janne Ahlin, 1987 / 2014.

One of sixteen postcards produced by Michael Asher on occasion of his exhibition at Le Consortium, Dijon, 7 June–27 July, 1991. Each depicted the heating system of a cultural building in the city, this being that which heated the Musée des Beaux-Arts.

Daniel Watt

Tadeusz Kantor's Objects

What was vital in the work of the Polish artist and director Tadeusz Kantor (1915–1990) was a staged space that gradually becomes an object in itself. In Gaston Bachelard's, *The Poetics of Space* he considers the intimacy of certain objects and spaces:

> Wardrobes with their shelves, desks with their drawers, and chests with their false bottoms are veritable organs of the secret psychological life. Indeed, without these 'objects' and a few others in equally high favour, our intimate life would lack a model of intimacy. They are hybrid objects, subject objects. Like us, through us and for us, they have a quality of intimacy. (Bachelard 1994: 78)

The wardrobe is an important object for Kantor's work, as was the chair, both relics that haunted his memory as many of them were left behind in a square in Krakow after each transportation to Auschwitz. In Kantor's theatre the issue of the object is raised to such significance that it gradually overwhelms the intimacy of the subject and takes on another form of existence:

> There are no returns.
> This is the tragic fate of a human.
> Instead, something else returned – the time of the o b j e c t ;
> of that 'something' that exists at the opposite pole of my
> consciousness, of 'me' –
> unreachable. [...]
> The object, which has been deep inside me,
> now started to call my name obtrusively and enticingly. [...]
> I was aware of the fact that its traditional representation, its
> 'image', could not return
> because it was merely a reflection,
> just like the moonlight,
> a dead surface.

> But the object is alive.
> (Kantor, 1993: 289)

Such an existence, here the 'time' of the object, then transforms further into the 'space' of the object. As was demonstrated in his 'machine of annihilation' (a heap of folded wooden chairs roped together) which, when noisily unfolded, crushed actors out of the small performance space they occupied with it.

Such a 'thing' becomes for Kantor the bio-object, not simply a fusion of thing and actor, but the entire staged space, the mise-en-scene as living object:

> BIO-OBJECTS were not just props that the actors made use of.
> Nor were they bits of the décor that you could play around with.
> They formed an indivisible whole with the actors.
> They emanated a life of their own, self-determining, independent of the FICTION (the content) of the drama.
> It was this 'life' and the ways in which it was made manifest that constituted the real content of the performance. Not the *plot*, but the actual *materials* of the show.
> (Kantor 1990: 158)

In the final piece of the trilogy of works usually associated with Kantor's 'Theatre of Death' period, *Let the Artists Die* (1985), the final transition from the closed room of childhood, via the shared room of family, and into the realm of culture and history is made. In this performance the recreation of an altar-piece is an excellent example of the bio-object: a manipulation of historical reality into the present by the co-existence of actors and the machines that held them in their awkward reconstructed poses. This could be seen as a synthesis of many of the works that had gone before; in many ways an approachable and understandable incursion of the real into the imaginary. But this invasion of the marginal, the interest in form (or *de*formation), not content, had been present for many years. In the context of object work it is worth recalling the *Popular Exhibition* (also called the *Anti-Exhibition*) of 1963 in which seemingly unimportant elements of the process of artistic production are exhibited instead of the work; notes, letters, packaging, materials. Similarly the *Emballages* of the 1960s allow a kind of entry to the performativity of materials as they become obscured, or detached from their real function, fused into a kind of hybrid that shows motion and a new kind of activity in their stillness. In the 1967 *Anatomy Class According to Rembrandt*, the clothing of the 'subject', the contents of his pockets and other apparently useless items, are shown to be the focus of the work. Kantor gradually pushes everything outside of its proper context, much as his wooden chairs ousted his actors from the performance space. Indeed, the very space itself is called into question in his performance of *Lovelies and Dowdies* (1973), where the audience were confined to the cloakroom of the theatre, looking on upon the entrance doors to the theatre that they never entered. The activities unfolding before them happened in an in-between space that was neither a place to perform, nor one in which the everyday activities of existence made any sense.

The thinking of the object went through many transformations in Kantor's work, eventually synthesising the bio-object and the performance event itself, re-emerging from the particularity of Kantor's Polish past to connect again with the object orphaned from history in his earliest work. Kantor provides us with a form of artistic practice straining at the limits of representation, struggling as it does to articulate the blended spaces of imagination and memory, particularity and impossibility. Kantor was continually crossing borders, and disciplinary boundaries, changing faces and bodies; transforming actors into animated things that challenged space itself. Kantor—this strange border-guard between the living and the dead—created an imagined space, based on a tangible reality, that brought thought, theatre, art and imagination together in a fashion at once unique but also incredibly familiar; for it seems so much the story of us all, this tale of a life lived through pictures, things and unreliable recollection. And now that Kantor's time has passed how might we begin to think again with objects and make them speak of us, but also listen to their own strange voices that tell of other realities and existences beyond our own?

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Installation views of the *Everest* exhibition at the New Walk Museum, 1953.
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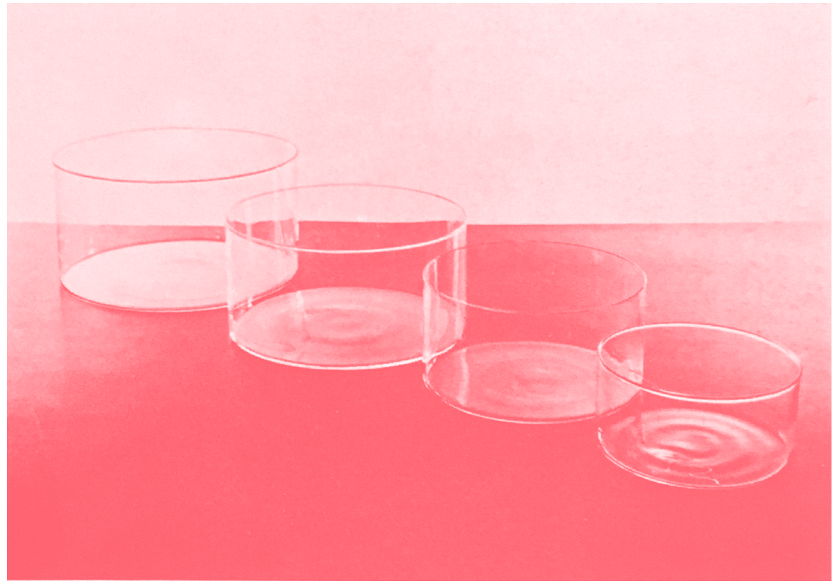

Frederick Kiesler, window display for Saks Fifth Avenue (New York), 1927/8
Contemporary art applied to the store and its display, Frederick Kiesler, 1930.

Catalogue image from *Machine Art*, produced on occasion of the exhibition at the Museum of Modern Art, New York, curated by Philip Johnson, 1934. The original caption read: '367 – Crystallizing dishes – Used in obtaining crystals from saturated solutions by evaporation – Corning Design Works – 45¢ to $1.25. – Eimer and Arnold'

Zoe Simmons

Mimicry

Over 1.7 million species of animals, of which over half are insects, have been described by scientists to date. Estimations of total numbers have ranged from between 3 – 30 million: within which is such a level of variation in shape, form and function of the life around us that in one breath we can be filled with both confusion and wonder. How can such a fabulous array of forms and behaviours have evolved? The answer is that we simply don't know yet. Research on the taxonomy, morphology and ecology of many species is still needed, as well as explorations of ecosystem functioning, speciation and niche exploitation.

Each of the species described to date lives, grows, breeds within a habitat, surrounded by other living organisms such as plants, fungi and bacteria. The functionality of complex habitat structures is in some ways a little like the insides of an intricate ticking pocket watch, each tiny piece working together in synchronisation. Habitats are organic systems however, growing and changing within lifetimes, and evolving through generations. They have the capacity to die and to heal. Organisms within these systems are equally as complex. Life histories are divided between stages to exploit different niches. Individuals develop new behaviours, others learn from them. Adaptations that lead to success are more likely to be retained genetically and thus, through the millennia, life has been able to proliferate into multivariate forms.

Cryptic colours and patterns are designed to camouflage the body, either against a specific background or generally within a particular habitat. Some species of crab spider such as *Misumena vatia* will adapt their body colour as they grow so as to match their background. Leafy seadragons have evolved a series of elongated fleshy appendages that mimic the shape and colour of the surrounding seaweed and kelp forest. As they move around gently in their underwater habitat they blend in against the background, no matter where they might be, looking for all the world like a drifting piece of seaweed. Whilst their camouflage is imperfect to the human eye when seen up close, when viewed at distance and through water it makes them nearly invisible.

These species have evolved methods to hide within their habitats as a form of defence. Defence mechanisms come in many forms, encompassing everything from the stings of bees and wasps to the venomous bites of snakes. Many of these adaptations include the production or sequestering of chemicals that are bitter or caustic. The bombardier beetle, for instance, has an extreme adaptation, utilising two chemicals and enzymes to produce a redox reaction that creates a super-heated gas that it sprays over would-be predators.

Cane toads have successfully colonised large areas of Australia after they were introduced as a pest control agent in sugarcane crops. Adult toads have a number of poison glands on their back; even their tadpoles are toxic if ingested. Subadult toads however lack the poison glands of the adults and rapidly lose the toxicity they had as tadpoles once they develop into froglets and move out of water and onto land. At this point in their life cycle they rely on the drab speckled brown colour of their skin to act as camouflage and keep them safe from predators. In this way they demonstrate how species have evolved to exploit different niches within a habitat at different points in their life cycles and how each stage is adapted to maximise the individual's chances of surviving to the next stage.

It is easy to understand camouflage as a form of visual mimicry of one's immediate environment, however some species deliberately and openly advertise their presence via aposematic colouration, which is where two colours 'oppose' each other, highlighting the difference between them and therefore standing out more than they would do otherwise. Common combinations of colours are black and white with red, yellow and orange. The common wasp for instance advertises in this way and with bright yellow stripes contrasted against black are easily recognisable, even when seen from a distance. The Blue-ringed octopus has a venomous bite containing a powerful neurotoxin: it causes paralysis of the respiratory muscles, leading to death by asphyxiation.

The bright colours of these species are their first line of defence and as such need to be as visible as possible. The secondary line of defence, be that a toxic skin secretion or venomous sting, are hidden from sight and thus invisible in the first instance. Whilst these secondary defences can be incredibly potent, or even lethal as in the blue-ringed octopus, it is easier and less costly if potential predators are dissuaded from even testing them.

Edward Bagnall Poulton coined the term 'aposematic colouration' in 1890 to describe this phenomenon after he was inspired to investigate the warning colouration of animals based, in part, on research by famous explorer and friend, Alfred Russel Wallace. The word 'aposematism' is derived from two Ancient Greek words meaning 'away' and 'sign', neatly summing up the employed mechanism. The examples Poulton gives in his text includes the 'gaudy colours of stinging insects' and the 'white tail of skunk'. His book on the colours of animals was one of the first comprehensive reviews of the subject and drew many examples from the insect class. He summarised the research that had been produced to date and discussed at length the various methods through which colours are produced, both their defensive and aggressive uses and, most importantly for this discourse, how they are employed by mimics.

Mimicry was first described by Henry Walter Bates in his 1861 work *Contributions to an insect fauna of the Amazon Valley: Heliconiidae*. Bates had left England in 1848 with his good friend and colleague Alfred Russel Wallace. Wallace spent four years in the Amazon whilst Bates went on to spend a total of eleven years exploring the Amazon River basin, its habitats, animals and plants. He made a number of scientifically important observations, but his work on mimicry has had the most impact, with researchers still investigating this phenomenon today. 'Batesian mimicry', as it is now known, is where one species, the 'mimic', evolves the same or very similar colour pattern as another species, the 'model'. Model species have aposematic colouration and some form of defence mechanism whereas mimics have only the colour. With the butterfly species that Bates studied, the models were distasteful to predators but the 'counterfeit' mimics as he described them were not. By matching the model in form, colour and pattern the mimic species gained a measure of protection from those predators.

Batesian mimicry is best thought of as a game of numbers: in any such system the predator, or potential 'dupe', has to learn to avoid the prey item. This means that a number of individuals will be eaten, either in whole or part. How many are eaten depends on how quickly the individual predators come to the conclusion that the prey item is not worth consuming and learn to avoid that particular colour pattern. It thus makes sense for the prey item to not only advertise through aposematic colouration but also to live as a relatively dense population so that a smaller number of individual predators must be 'trained'. This may have to happen with each successive generation and across a number of different predator species. Training, however, is passive and an individual within the prey species relies almost entirely on luck to avoid predation.

How do mimics survive within this system if they are unable to defend themselves? The answer, as alluded to earlier, lies in the numbers: Batesian mimicry is about bluffing, and the mimic must be present in lower numbers than its model. This reduces the overall effectiveness of the model's message, but not beyond that significant point at which it becomes so diluted as to be lost altogether. Instead, whilst it may take longer for a predator, or dupe, to learn the colour pattern, the numbers of individuals lost to both the model and mimic species will remain sufficiently small enough so as to not reduce the overall efficiency of the system. Thus the mimic can cheat its way through, with enough individuals surviving so as to reproduce and retain the genetics from one generation to the next.

Where two or more harmful or unpalatable species (previously defined as models) have evolved the same colour pattern they demonstrate Müllerian mimicry. Described by Johann Friedrich Theodor Müller in 1878 it was one of the first biological theories ever produced with a supporting mathematical model. Simplistic at its heart, Müller was able to use his theory to demonstrate how it would be profitable for multiple species to evolve a similar colour pattern, even when they have the ability to defend themselves. We once again return to a game of numbers though in this instance the mimicry is described as honest, and predators cannot be thought of as dupes as none of the species involved is being deceitful. Predators still have to learn to recognise a colour pattern and combination (and to some extent body shape) which requires them to eat, or attempt to eat, a number of individuals. The effect of multiple species participating is to reduce the percentage odds of predation for each of them.

Mimicry rings are more complex, and involve a group of species that conform to a general colour pattern and shape. Probably starting from a two species paired through Müllerian mimicry, additional species evolve to meet this through advergent evolution, forming a ring of species. This abundance of defended species all utilising the same colour and pattern increases the likelihood that this adaptation spreads, as predators will avoid this in both other species and the original models. Thus rings can include species exhibiting Batesian mimicry as well as Müllerian.

How good of a mimic a species has to be in order to benefit from any of these described scenarios though is still under debate. It is for instance easy to ascribe mimicry where coincidence or convergent evolution has occurred. It is also easy to forget the power that the dupe(s) has. Whilst it may be passive, the dupe is the one exerting the ultimate control over the situation, choosing whether or not to pursue a prey item. External pressures such as climate change or habitat degradation cause adaptation, evolution and behavioural changes that continually influence this decision-making process.

Natural selection and species evolution continues, though for many species it works on a longer time-scale than the average human lifespan. Organisms that have relatively short lifespans and high fecundity allow it to be seen and investigated: bacteria and some species of insect, such as aphids and fruit flies belonging to the genus *Drosophila*, have proven to be good study subjects as they can be kept within laboratory conditions. This has allowed researchers to test how selection pressures influence genetic inheritance and begin to explore evolution at the cellular level. Whilst our understanding of such things is still not comprehensive enough to be able to predict how different pressures influence habitat systems and the assemblages of species within them, we can demonstrate how inheritance creates change through time. From our point of view, evolution of antibiotic resistance in bacteria is perhaps one of the most unwelcome examples, though for those bacteria species it is a fine success.

Visual mimicry has evolved repeatedly in a range of organisms and whilst the basic principles are easily understood, recent research to understand the genetic basis for this evolution has revealed a much more complex narrative. The principles of Batesian and Mullerian mimicry as outlined here do nothing to reflect this complexity which needs to be investigated further. Whilst the majority of studies have been undertaken on butterflies, other famous case-studies include that of coral snakes, salamanders and perhaps one of the most impressive of all, that of the Mimic octopus that models, among other things, on Banded Sea Snakes, some of the most venomous snakes in the world.

What makes the Mimic octopus, and indeed many of its fellow cephalopod counterparts such as the Bobtail squid or Broadclub cuttlefish so impressive is their ability to mimic not only the visual colours of their chosen model, but also the texture, size, and if applicable, behaviour. They can also mimic a number of different models, switching between camouflage and Batesian mimicry as they choose. The Mimic octopus will draw its arms together so that it looks like a flatfish, and it will undulate across the seabed, copying its swimming motion as well as camouflaging itself against the sand by changing its colour. It also is able to copy the shape and behaviour of the Lionfish, which has poison tips to the barbs on its fins.

There are other forms and styles of mimicry beyond even this. Visual mimicry also encompasses the signal stealing behaviours of certain species of Lampyrids or fireflies. Females of different species signal to prospective mates when it is dark through bioluminescent signalling akin to the dot-dash system employed in Morse code. Each species has its own signal pattern so as to ensure males and females of that species can find each other within mixed species habitats. Some females however will learn and then mimic another species' signal pattern so as to lure a male and secure herself a meal. Auditory signalling works similarly, with some bird species for example, mimicking the warning calls of another species so as to scare away individuals from a food source, by turn securing extra food for themselves. Instead of aposematic colouration the Delicate Cycnia moth produces a clicking sound to warn predators away, a behaviour that is copied by its mimic. A predatory assassin bug, *Stenolemus bituberus*, has learnt to mimic the vibrations made by prey items that have fallen into the webs of spiders. In this extraordinary example of evolution, the predator has in turn become the prey, as the bug exploits the spiders prey response on its web to lure the spider into a trap.

Many more such stories may come to light as we continue to explore the world around us; mimicry is a fascinating yet small part of the overall narrative of evolution and speciation, and our natural environment remains a treasure trove to all who may wish to explore it.

Further reading

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Glossary of species

Misumena vatia. Family Thomisidae, Crab Spiders.

Phycodurus eques or Leafy Seadragon. Family Syngnathidae, which includes seadragons, pipefish and seahorses.

Bombardier beetle, various species. Family Carabidae, Ground Beetles.

Pieris brassicae or Large White butterfly. Family Pieridae, Whites and Sulphurs

Cane toad, *Rhinella marina*. Family Bufonidae, True Toads.

Poison Dart Frog, various species. Family Dendrobatidae, Poison Dart or Dart Frogs.

Blue-ringed octopus, Genus *Hapalochlaena*, various species. Family Octopodidae, Octopus.

Heliconidae butterfly, various species, now Heliconiinae. Family Nymphalidae, Brush-footed Butterflies.

Coral snake, various species. Family Elapidae, Elapid Snakes.

Mimic Octopus, *Thaumoctopus mimicus*. Family Octopodidae, Octopus.

Banded Sea Snake, various species. Family Elapidae, subfamily Hydrophiinae, Sea Snakes or Coral Reef Snakes.

Bobtail squid, various species. Families Idiosepiidae and Sepiolidae, Bobtail Squids.

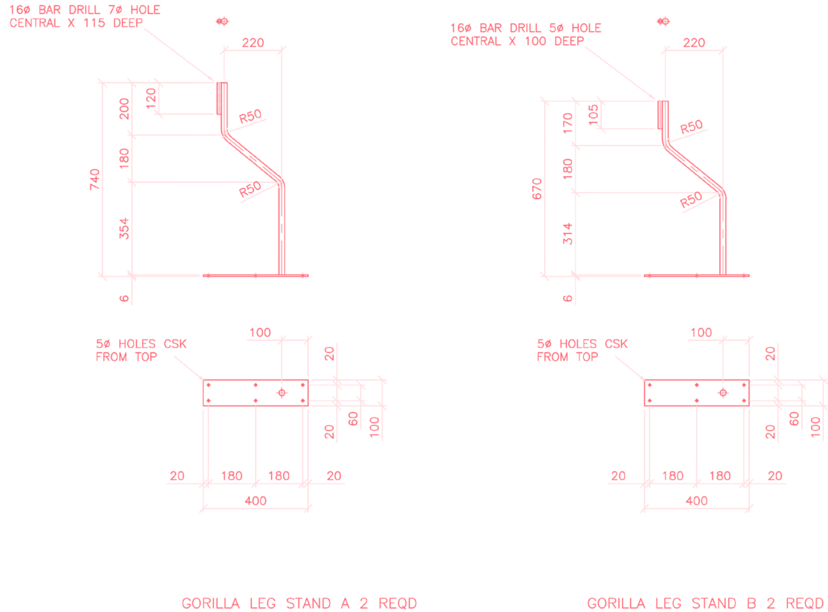
Broadclub cuttlefish, *Sepia latimanus*. Family Sepiidae, Cuttlefish.

Lampyrid, various species. Family Lampyridae, Fireflies or Glow worms.

Delicate Cycnia moth, *Cycnia tenera*. Family Erebiidae, subfamily Arctiinae, includes Tiger, Footman and Lichen moths.

Thread-legged assassin bug, *Stenolemus bituberus*. Family Reduviidae, Assassin bugs.

Image of wooden board formers for shaping and dyeing nylon stockings.
Corah of Leicester 1815–1965 by Keith Jopp, 1965.



Fabrication drawing by Denis Swann for gorilla skeleton / leg supports
produced for the exhibition. Design specification by the artist.

Daniel Watt
Dr Daniel Watt is a Senior Lecturer in English and Drama at the School of the Arts, English and Drama, Loughborough University.

Zoe Simmons
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The images in this publication have been selected by the artist.

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Mike Cooter: The Mimic, the Model and the Dupe is the second in a series of collaborative exhibitions and artist commissions proposed by Radar at Loughborough University Arts. This commission follows the first by Matthew Darbyshire at Nottingham Castle Museum and Art Gallery. Both artists have engaged with the work and ideas of Tadeusz Kantor.

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