les immatériaux

Inventory

« Les Immatériaux »

*Inventaire* [Inventory] catalogue

English version, 2022

This volume (*Inventaire* [Inventory], 71 pages, unbound, 19.5 × 29.5 cm) formed the third part of the catalogue of the exhibition « Les Immatériaux » (Centre Georges Pompidou, Paris, 28 March – 15 July 1985), and was originally only produced in French. The English translation and the reconstruction of the original design by Grafibus / Luc Maillet were commissioned by the Centre Pompidou in the context of « Beyond Matter » (2018 – 2023), a cooperative project with the ZKM | Center for Art and Media Karlsruhe and others, supported by the Creative Europe Programme of the European Union. Curatorial team at the New Media Department of the Musée national d'art moderne / Centre de création industrielle: Marcella Lista, Head Curator, Philippe Bettinelli, Curator, and Julie Champion, Assistant Curator.

Centre Georges Pompidou

# Inventory

# plan of the exhibition

Machines Stylistiques

Logiques artificielles

Texte dématérialisé

Peintre sans corps

Toutes les copies

Architecture plane

Petits invisibles

Peinture luminescente

Mémoires artificielles

Epreuves d'écriture

Contes et chansons modulaires

Les mots sont des objets

Temps différé

Creusets stellaires

Profondeur simulée

Volées d'escaliers

Jus d'oronge

Référence inversée

Visites simulées

Trace de voix

L'objet perdu

Mots en scène

Matériau dématerialisé

Indiscernables

Surface introuvable

Variables cachées

Matricule

Auto-engendrement

Irreprésentable

Arôme simulé

Odeur peinte

Images calculées

Tous les auteurs

Terroir oublié

Vestibule de sortie

« Infra-Mince »

Corps éclaté

Jeu d'échecs

Langue vivante

Musicien malgré lui

Négoce peint

Monnaie du temps

Préparlé/Précuisiné

Vestivule d'entrée

Accès

Les trois mères

Corps chanté

L'ange

Deuxième peau

Nu vain

Ration alimentaire

Toutes les peaux

Habitacle

Mangeur pressé

Homme invisible

Tous les bruits

Trace de trace

Théâtre du non-corps

Lumière dérobée

Espace réciproque

Ombre de l'ombre

Vite-habillé

Philippe Delis, architecte DPLG

| raw material [matériau] |
| matrix [matrice] |
| hardware [matériel] |
| content [matière] |
| maternity [maternité] |

So as to facilitate the order of your visit and the use of the *Inventory*, a key is given on each sheet, highlighting the title of the site in bold type, along with the main rubric to which it relates. Other sites that relate to other rubrics, but with which the site has some affinity, are indicated in regular type.

*In certain cases, we have been unable to identify the exact origin of images. We thank the authors and rights owners for their understanding.*

# entrance chamber

Humans receive life and meaning: the soul. They are supposed to give it back intact, perfected. Today, is there anything that is *destined* for them? This will be a major question in our show.



Egyptian bas-relief—goddess offering the sign of life to King Nectanebo II, the last independent Pharoah of Egypt—presented in low light.
On the soundtrack, breathing. There follows a long corridor at the end of which, in a mirror, we see reflected the space to which it leads. A doppler sound (of the carotid artery) in this passage.

Fragment of the temple wall of Karnak North. Goddess offering the sign of life to King Nectanebo II.

# I at the theatre

'[...] the words are there, somewhere, without the least sound. I don't feel that either. Words falling, you don't know where, you don't know whence? Drops of silence through the silence? I don't feel it. I don't feel a mouth on me, nor a head. Do I feel an ear? Frankly now, do I feel an ear? Well frankly now I don't. So much the worse: I don't feel an ear either. This is awful. Make an effort: I must feel something. Yes, I feel something (they say I feel something). I don't know what it is, I don't know what I feel. "Tell me what I feel and I'll tell you who I am." They'll tell me who I am, and I'll have heard (without an ear I'll have heard). And I'll have said it (without a mouth I'll have said it). I'll have said it inside me, then in the same breath outside me. Perhaps that's what I feel: an outside and an inside and me in the middle. Perhaps that's what I am: the thing that divides the world in two—on the one side the outside, on the other the inside. (That can be as thin as foil.) I'm neither one side nor the other, I'm in the middle. I'm the partition. I've two surfaces and no thickness. Perhaps that's what I feel: myself vibrating. I'm the tympanum. On the one hand the mind, on the other the world: I don't belong to either. It's not to me they're talking, it's not of me they're talking. No, that's not it, I feel nothing of all that. Try something else [...].'

Samuel Beckett, *The Unnamable.*

# theatre of the non-body

Five dioramas illustrate the question of the body in theatre. Absence to the world, absence from the world. The body is exhausted. Imperceptible movements in scenery and lighting render this Beckettian interrogation perceptible.
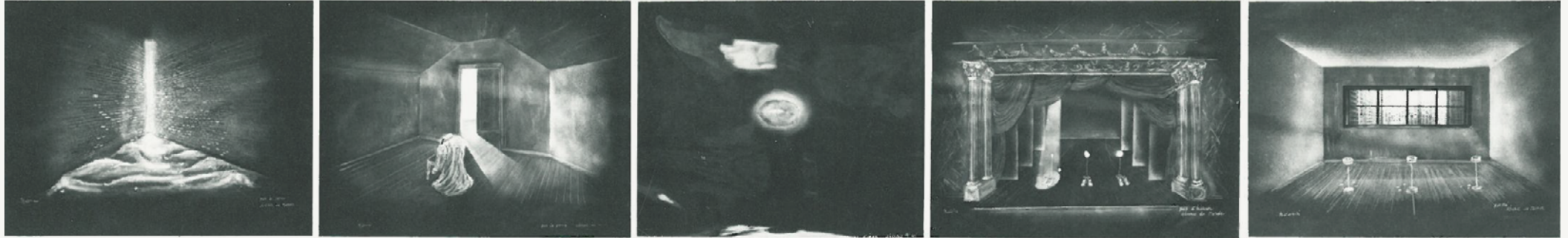


Dioramas by Jean-Claude Fall
and Gérard Didier.

Each case introduces a staging of one of
the five sequences governing the concept
of the exhibition:
not the body: raw material [matériau]
not speech: matrix [matrice]
not the other: hardware [matériel]
not history: content [matière]
not I: maternity [maternité]

This extensive site suggests the resistance
of the body (I, here, now) to the demateria-
lisation of its contexts in a mediated life.

**Design**
Jean-Claude Fall

**Maquettes**
Gérard Didier

**Fabrication**
Les productions de l'Ordinaire

# raw material [*matériau*]

Kevlar fibres, one and a half times denser than water and four or five times stronger than steel. With this paradoxical raw material you can build in earthquake zones.

Gender: masculine. Unless it turns out that you hate being a man. Biochemistry and surgery can make you a woman's body. Make this raw material, your sex assigned at birth, conform to your desire. Escape the fate prescribed for you.

Raw material [*matériau*]: that in which a message is inscribed; its carrier. It puts up resistance. One must know how to take it, how to overcome it. Such was the task that was set: to make a table out of a tree.

But what happens when the raw material [*matériau*] is planned, simulated, and then made according to the needs of the project? Any resistance to the project's inscription of a message would be gone. The message no longer comes up against its material support, but invents it to order. The work does not confront its object, but calculates and deduces it.

Shifting of professional work toward design and informatics. The declining value of work, of experience, of will, of freedom. Combinatorial imagination, experiment, and repeated trials are the order of the day.
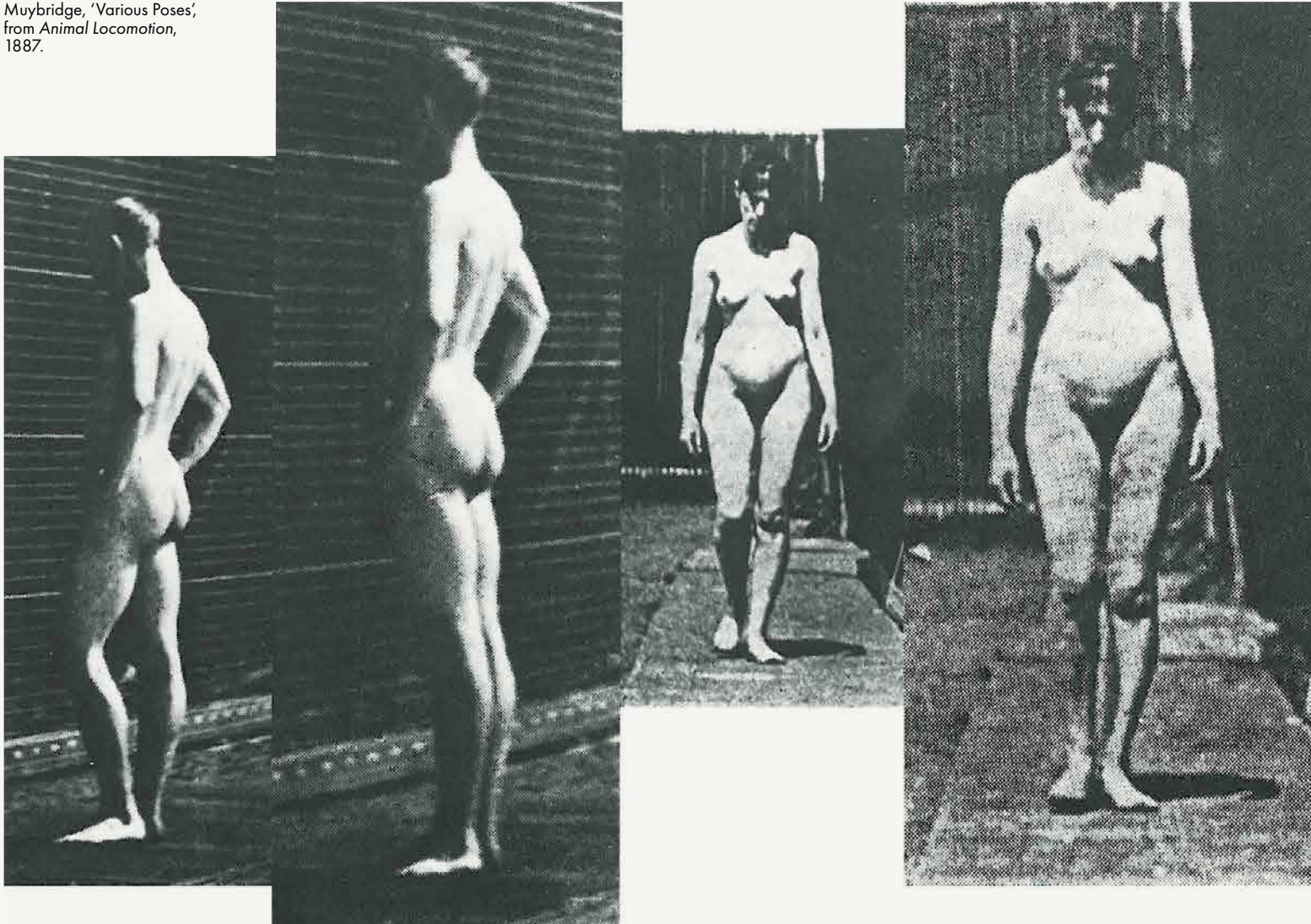
An urgent question: Does this loss of raw material [*matériau*] necessarily entail unemployment?

J-F L

# vain nakedness

The stripped-down body. Nudity as limit of meaning, as absurd presence. Flesh replaced by neutral, measurable, multipliable, countable raw material.

Muybridge, 'Various Poses', from *Animal Locomotion*, 1887.



raw material [matériau]

matrix [matrice]

hardware [matériel]

content [matière]

maternity [maternité]

A forest of twelve asexual mannequins. Inside, projection of a sequence from the film *Monsieur Klein*, alternating with a photograph of a deportee during the Second World War.

Muybridge, 'Walking', from *Animal Locomotion*, 1887.

Photograph from the Centre de Documentation Juive Contemporaine.

Extract from the film *Monsieur Klein* by Joseph Losey, 1976 (Franfilmdis).

# second skin

Natural skin considered as our first garment. An envelope protecting the body from external forces, it instigates the opposition between inside and outside. Skin prostheses displace this limit. Where does the outside begin?
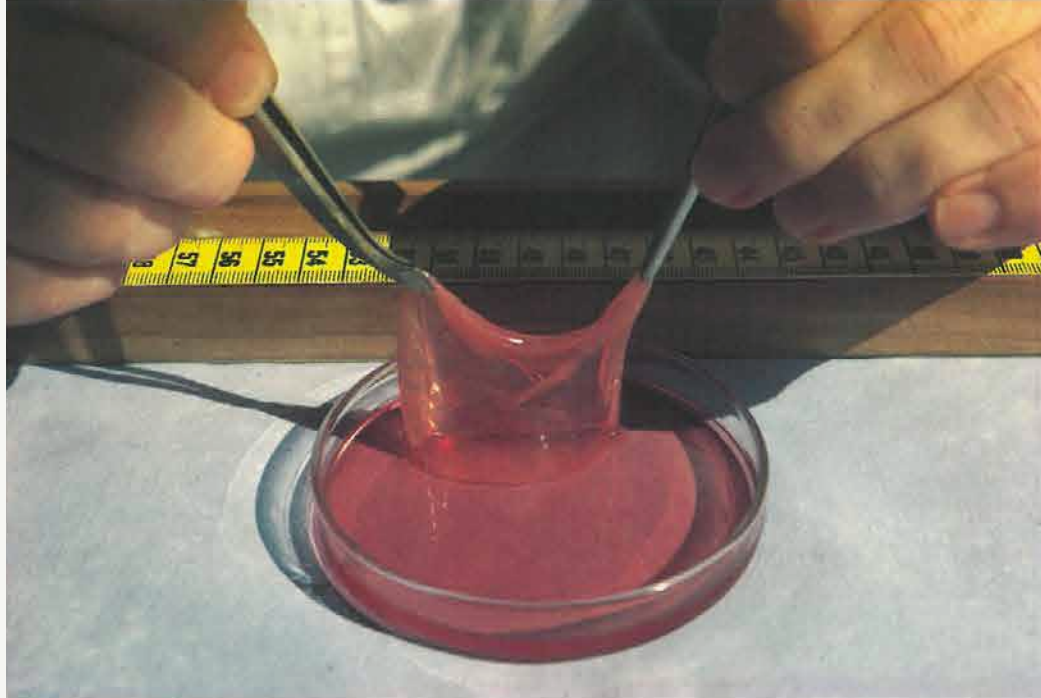


Different types of skin under plastic:
• Provisional skin graft: pig skin, a collagen film, synthetic dressing;
• Autograft and combined graft: Total graft, expanded skin, combined with homograft skin, autograft;
• Artificial skin: synthetic skin.

In display case: skin culture (dermal equivalent and epidermisation).

As a counterpoint, the combination of an astronaut suit and a sensory deprivation chamber, artificial envelopes that make it possible to push the limits of the skin outward.

Dermal Equivalent.

| raw material [matériau] | second skin |
|---|---|
| matrix [matrice] | all kinds of skins |
| hardware [matériel] | compartment |
| content [matière] | |
| maternity [maternité] | speed dressing |

**Photo recto**

**Photo**
Louis Dubertret (Hôpital Henri Mondor,
Créteil)

# the angel

The raw material of the body has its own identity. To what extent can the desire to be other, to be the other, be inscribed into the body?
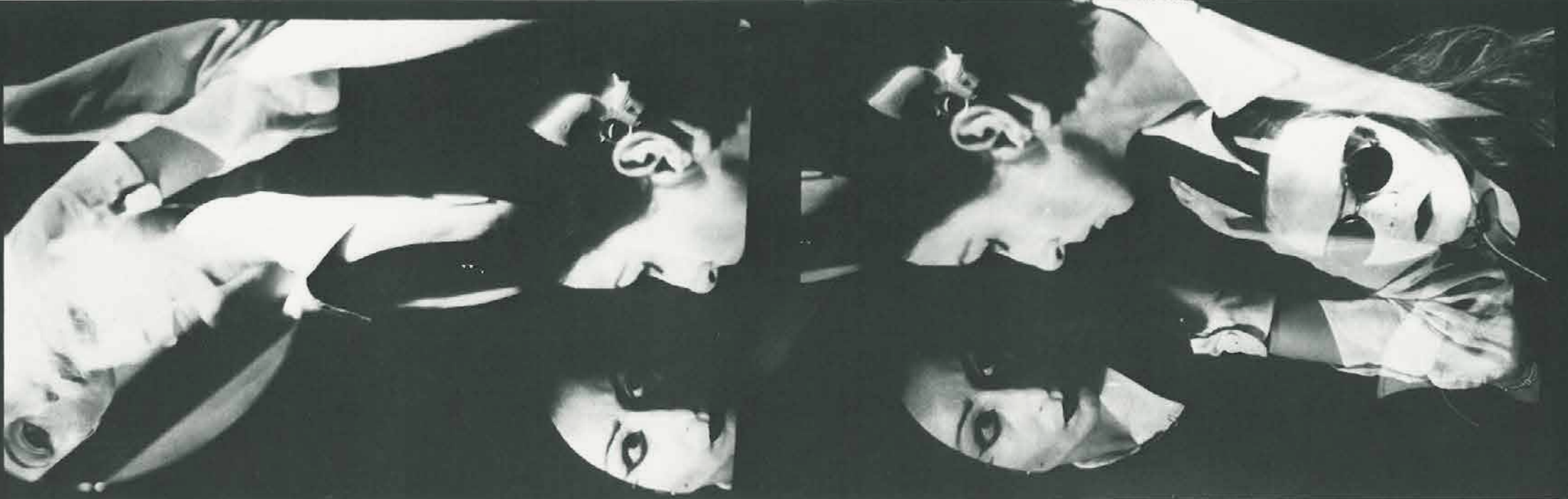


| raw material [matériau] | the angel |
|---|---|
| matrix [matrice] | |
| hardware [matériel] | invisible man |
| content [matière] | |
| maternity [maternité] | the three mothers |

Enlargement of a photo by Annegret Soltau, *Schwanger*, 1978. Body reworked according to the 'choice' of identity: the transsexuate scar. In the background, as a frieze, photographic enlargement of the statue *Sleeping Hermaphroditus*, myth of a lost unity.

A series of photos by Maria Klonaris and Katerina Thomadaki playing on the ambiguity of identity. In the centre, a staging of the duality of the sexes, at once invincible and uncertain:
 • two profiles, man and woman, face to face, separated by a two-way mirror that reflects each image in isolation;
 • two profiles, man and woman, face to face, separated by glass upon which the reflection of one is superimposed upon the image of the other.

Maria Klonaris and Katerina Thomadaki, extract from *Orlando-Hermaphrodite II*, 1983.

**Photo**
Annegret Soltau,
*Schwanger I [Pregnant I]*, 1978.

**Photos**
Maria Klonaris, Katerina Thomadaki, extracts
from *Mystery I: Sleeping Hermaphrodite*,
1982, and *Orlando-Hermaphrodite II*, 1983.

# sung body

A new genre, the music video features its own style of writing. Images of the singer's body and those of his bandmates, and of the space around them, are cut up and reedited to fit with the rhythm and melody.



Elvis Costello, clips
from music video for
*Accidents Will Happen.*

| raw material [matériau] | sung body |
|---|---|
| matrix [matrice] | all kinds of noises |
| hardware [matériel] | inadvertent musician |
| content [matière] | unrepresentable |
| maternity [maternité] | |

On three monitors, sequences analysing effects of appearance, disappearance, encapsulation, and sequencing. Drawn from around sixty music videos, they have been ordered into twenty-four categories developing the themes:
- re-treated body
- scenery and decoration
- framing and encapsulation of images
- movement, speed, and rhythm

'Clips under the Magnifying Glass'

## Directors
Christophe Bargues
Jean-Paul Fargier

## Directors' Assistant
Catherine Testanière

## Montage
Cédric Bossard

## Mixing
Nicolas Joly

## Head of Production
Annyck Graton

## Editor
Thierry Chaput
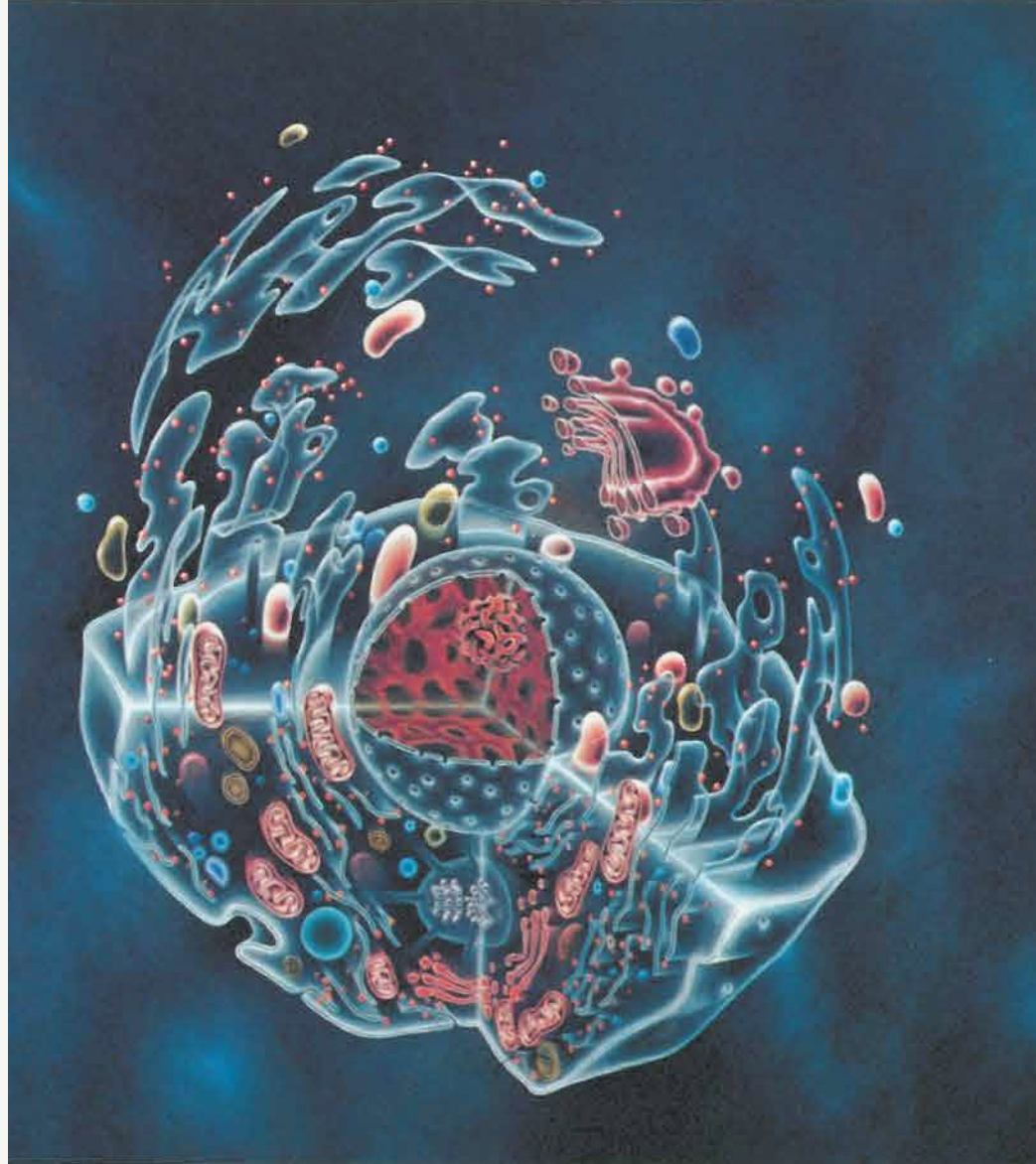
# exploded body

From the individual human to the anonymous molecule, an approach to a universal constitution of the living. Disassembling a more complex organism reveals the same elements that make up the very simple.



| raw material [matériau] | exploded body |
|---|---|
| matrix [matrice] | living language |
| hardware [matériel] | |
| content [matière] | reciprocal space |
| maternity [maternité] | the three mothers |

Series of five graphic panels: body, organs, muscles, tissues, cells.
Arranged to give the impression of the progressive erasure of 'the body' in its apparent unity, from which is extracted the universal 'language' of macromolecules.

Tanguy de Rémur,
'La Cellule'.

Illustrations
Denis Horvath (*Grand dictionnaire encyclopédique Larousse*).

# 'Infra-Thin'

'When the tobacco smoke also smells of the mouth which exhales it, the two odours marry by infra-thin' (Marcel Duchamp). A secret apparition beneath appearance. The artist seeks the event, with its intangible character. The visual work testifies to the invisible within the visible.
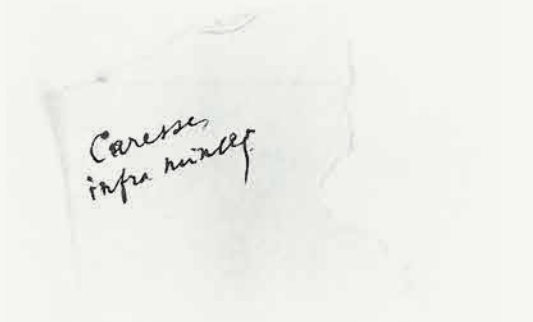

2


1


4

VISIBILE

Quand
la fimée de tabac
sent aussi
de la bouche
qui l'exHale,
les deux odeurs
s'épousent par
INFRA-miNce
marcel Duchamp
3
1

| raw material [matériau] | 'Infra-Thin' |
|---|---|
| matrix [matrice] | |
| hardware [matériel] | |
| content [matière] | trace of a trace |
| maternity [maternité] | |

1. Marcel Duchamp, from *Draft Piston*, 1914, to *Glider Containing a Water Mill*, a set of documents, drawings, sketches, and letters by the author, from *Water and Gas on All Floors*, 1958.

2. Yves Klein, *Zones of Immaterial Pictorial Sensibility*, 1959. Documents certifying the sale of zones of pictorial sensibility on the banks of the Seine.

3. Giovanni Anselmo, *Invisibile*, 1969. On the body of the walker, at leg height, is inscribed the trace of his presence. The spectator becomes the work.
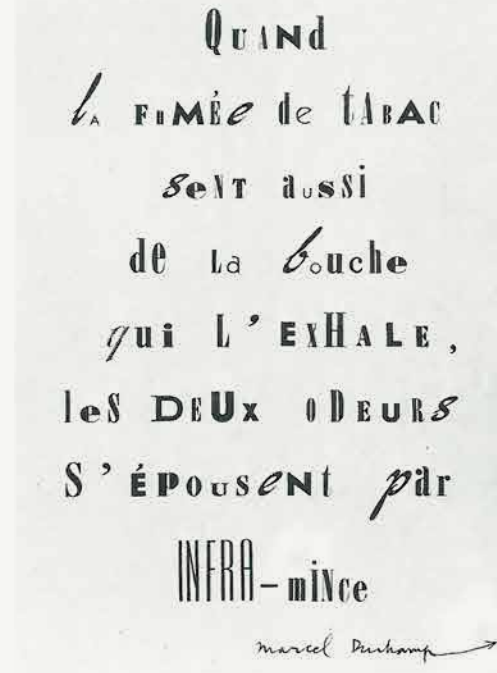
4. Thierry Kuntzel, *La desserte blanche*, 1980. A video, a minimal image, three white neon lights overlooking it.
A work about the birth of the visible.

**Photos and documents recto**
1.2. Documentation du
Musée National d'Art
Moderne, Centre Georges
Pompidou, Paris
4. Emmanuel Meynard

1. Marcel Duchamp
(Blainville, 1887–Neuilly, 1968)

Different photographs and documents in which Marcel Duchamp developed the notion of the *Infra-Thin* (documentation of the Musée National d'Art Moderne, Centre Georges Pompidou, Paris).

It has been remarked how often Marcel Duchamp used the notion of the *Infra-Thin* which he himself had developed. Denis de Rougement, in a 1945 interview with the artist, asked him what this term meant: '[It's something that] escapes our scientific definitions. I chose on purpose the word *mince* [thin] which is a word with human, affective connotations, and is not an exact laboratory measure. The sound or the music which corduroy trousers, like these, make when one moves, is pertinent to the *infra-mince*. The hollow in the paper between the front and back of a thin sheet of paper... To be studied!...it is a category which has occupied me a great deal over the last ten years. I believe that by means of the infra-thin one can pass from the second to the third dimension.' (Denis de Rougemont, 'Marcel Duchamp, mine de rien', in *Preuves* 18:204, 46–47, translated in M. Sanouillet and E. Peterson [eds.], *The Essential Writings of Marcel Duchamp* [London: Thames and Hudson, 1975], 194).

Note also, in the publication by the Musée National d'Art Moderne, a number of *Unpublished Notes* of Duchamp's which, following those of *The Green Box* and *The White Box*, are essentially concerned with this notion.

2. Yves Klein
(Nice, 1928–Paris, 1962)

Maquettes, counterfoils and cheques for the *Zones of Immaterial Pictorial Sensibility*, 1959. Note the change from 'a volume of sensibility' to 'zones, etc.' in the definitive version of the chequebook in Paris.
Original drawing made on the request of Iris Clert, pen and ink, gold paint on papier collé on a sheet, blue gouache. Dimensions of a cheque: 0.097 × 0.31 m.
Signed at the bottom of the cheque, in the centre: Yves Klein, Undated
On the verso of the cheque, sketch in blue ink.
Paris, Musée Nationale d'Art Moderne, Centre Georges Pompidou
AM 1980–39

3. Giovanni Anselmo
(Borgofranco d'Ivrea, 1934– )
lives in Turin

*Invisibile*
1969
Projector and slide with the inscription 'visibile'.
Turin, collection of the artist, courtesy Galerie Liliane and Michel Durand-Dessert.

A slide projector projects, from a certain distance, not necessarily onto a screen, a slide upon which is written VISIBILE (visible). What is visible thus appears invisibly. If one places oneself at this distance from the projector one's body is transformed into a screen upon which there appears the word VISIBILE. Anselmo: 'I wanted to create an invisible work. But if I want to be sure that it is invisible, I can only do so by making it visible. If I want to materialise the invisible, then the invisible immediately becomes visible.

The invisible is that which is visible but cannot be seen' (extract from Jean-Christophe Ammann, *Giovanni Anselmo*, exhibition catalogue [Musée de Grenoble, 1980] 15).

4. Thierry Kuntzel
(Bergerac, 1948– )
lives in Paris

*La desserte blanche*
1980
Video, made with the support of INA, 3/4-inch UMatic.
Video monitor and white neon tubes above.
Paris, collection of the artist.

Raymond Bellour wrote in *Cahiers du cinéma* 321, in a text entitled 'Thierry Kuntzel and the Return of Writing': ' [...] See the three *Deserts: white, red, blue,* and the *multiple*. Matisse's Desert here serves as an emblem [...] *The white*. Essences of the gesture, in a black and white stratified by a positive-negative mixture subjected to minute variations of lighting, between movement and its arrest, its phantomatic reinitiation [...] The gesture in time, which eternalises itself, becomes a matter, from instant to instant, via the mental and visual accumulation of instants, producing a global effect of painting in motion, between bas-relief and photography.'

# elusive surface

The perception of a surface as flat depends upon the scale of observation. Two-dimensional representation is a convention. Every surface conceals the textural relief of its raw material.
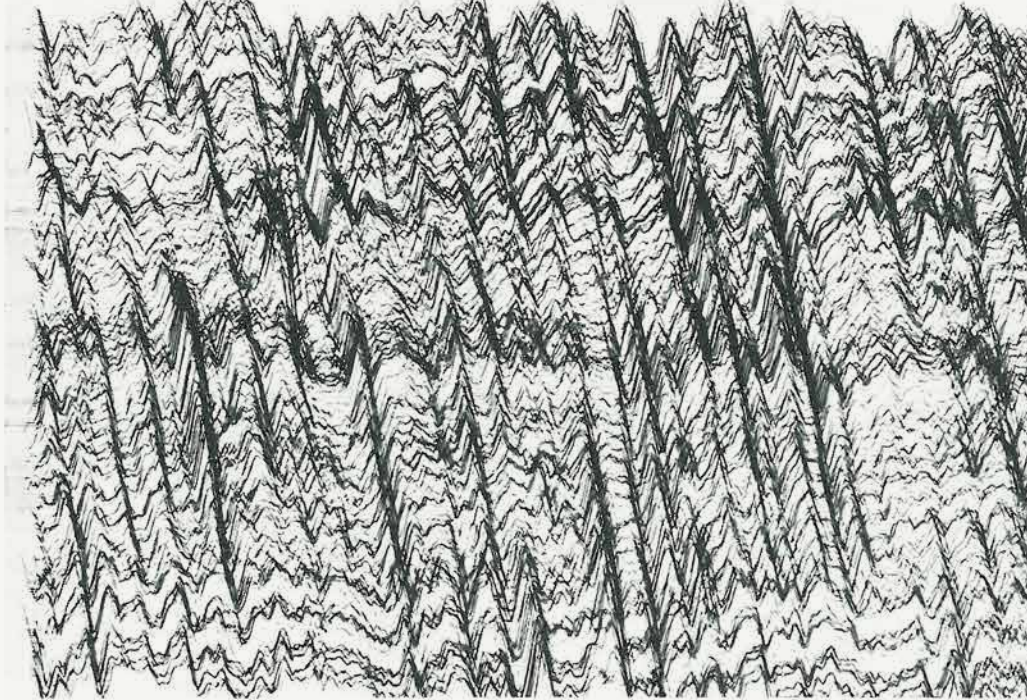


1. Study of the surface of IGN (Institut Géographique National) paper with the use of a rugosimeter.
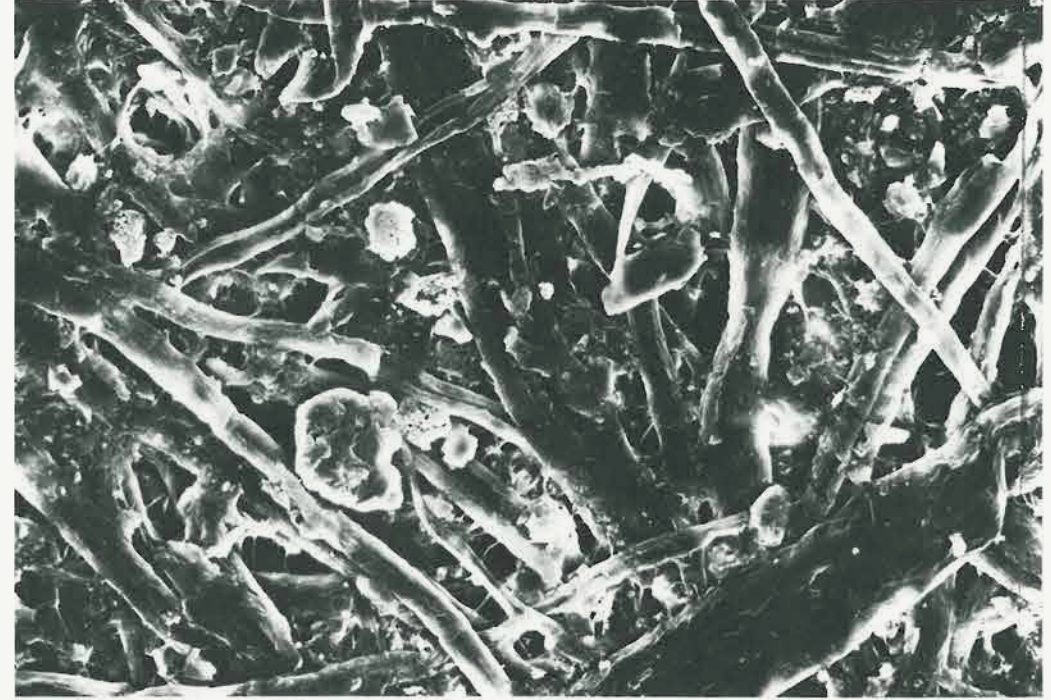


2. Scanning electron microscope view of a sheet of IGN paper.

| raw material [matériau] | elusive surface |
|---|---|
| matrix [matrice] | |
| hardware [matériel] | |
| content [matière] | simulated depth |
| maternity [maternité] | |

Juxtaposition of an IGN relief map of France, a pliable flat map of France, a blank sheet of IGN paper, a photo of a rugosimetrical analysis of the surface of this paper, and finally enlargements of its texture obtained with a scanning electron microscope.

# indiscernibles

A physical particle is not discernible by itself, but only via its position. Take the group formed by the three first numbers: 123, 132, 213, 231, 312, 321. The order of the numbers determines the numerical value of the series. In the same way, it is not the 'individual' properties of an electron, but its place within a matrix, that determines the sense of the phenomenon. The numbers 1,2,3: 'uniforms' donned by particles. What makes the meaning is the order in which the uniforms appear.

Slide of water drops.
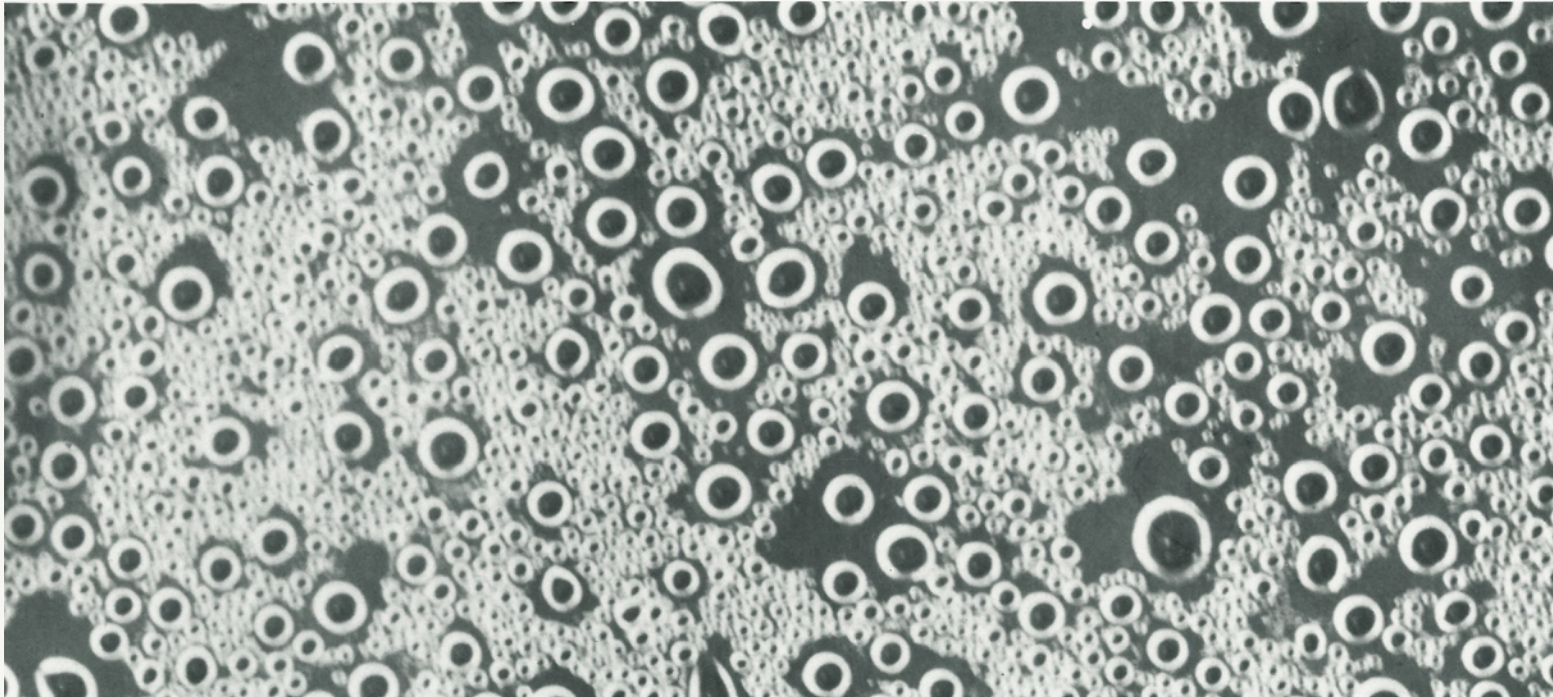


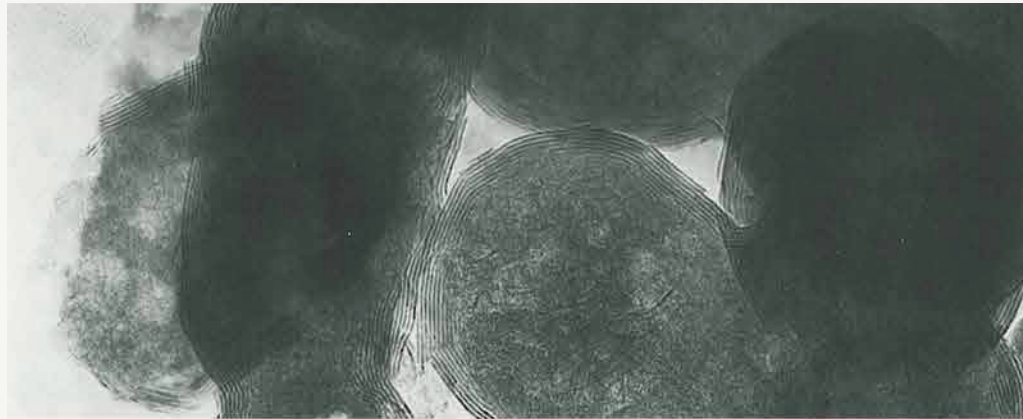| raw material [matériau] | indiscernibles |
|---|---|
| matrix [matrice] | registration |
| hardware [matériel] | |
| content [matière] | |
| maternity [maternité] | currency of time |

Three mannequins in different uniforms, multiplied by mirrors and lit up simultaneously or alternately. On a screen, a scientific explanation of permutations.

# dematerialised material

The new industrial 'hard' raw materials. Their singularity. The multiplicity of uses for them. Raw material created as a function of a project, and not the other way around. Analogy with the situation in the arts (for example, music and its electronic sonorous 'raw material').



1. Alloy of aluminium and silver.

| raw material [matériau] | dematerialised material |
|---|---|
| matrix [matrice] | little invisibles |
| hardware [matériel] | |
| content [matière] | inverted reference |
| maternity [maternité] | neglected terrain |

Staging designed to demonstrate this analogy. Circular audiovisual multimedia display. Slideshow panorama on eight screens and three installations. Original and archive documents assembled with the help of major French companies.

2. Steel.



3. Composite.

## Design
Philippe Puicouyoul

## Direction
Patrick Arnold
Philipe Puicouyoul

## Photography
Georges Meguerditchian

## Soundtrack
Gérard Chiron
Arnaud Petit

## Video
Cédric Bossard
André Coroller
Didier Coudray
Marc Urtado

## Head of Production
Annyck Graton

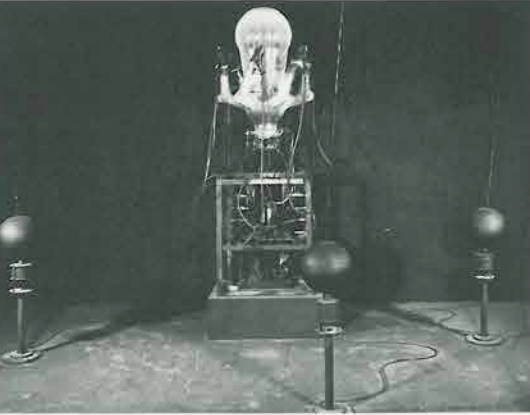## Audiovisual Coordination
Martine Castro
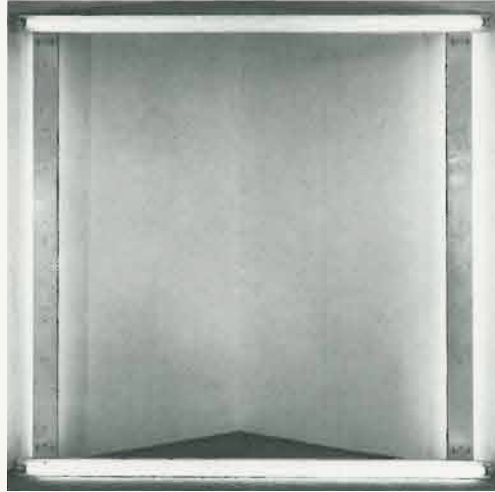
## With the support of
CNES
IRSID

# luminescent painting

After the use of paste and colour chemistry chosen as materials for the representation of light, light now presents itself as the raw material of the work.



4



5
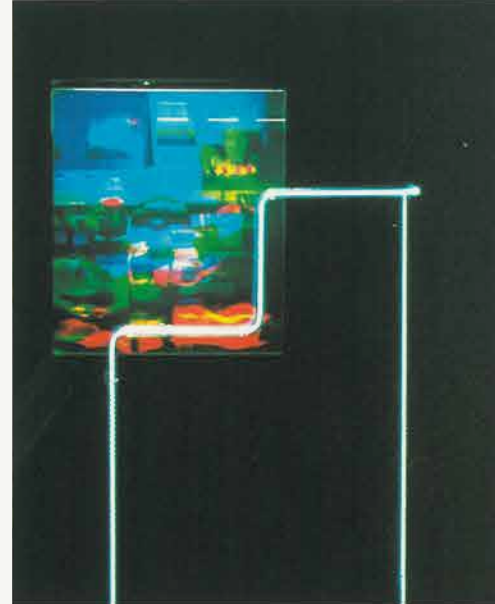


3



1



6



7

| raw material [matériau] | luminescent painting |
|---|---|
| matrix [matrice] | little invisibles |
| hardware [matériel] | |
| content [matière] | shadow of a shadow |
| maternity [maternité] | |

1. László Moholy-Nagy, *Licht-Raum-Modulator*, 1930 (replica). The machine in motion disappears into the theatre of shadows it generates.

2. Lucio Fontana, *Ambiente*, 1967. Physical light is the painter's gesture toward space.

3. François Morellet, *Parallèles de néon 0°, 45°, 90°, 135° avec quatre rhythmes interférents*, 1963. The incursion of a neon tube—apart from its light—makes the minimalism of the structure vacillate.

4. Takis, *La Méduse*, 1980. Electromagnetic machinery becomes the guardian of light.

5. Dan Flavin, *To Donna*, 1971. The geometry of the structure subtends a space become colour.

6. Sam Moree, *Cartesian Memories*, 1983. Flickering violet neon light alongside the light that generates the hologram.

7. Robert Ryman, *Midland I*, 1976. Ryman identifies the materiality of painting. He names it.
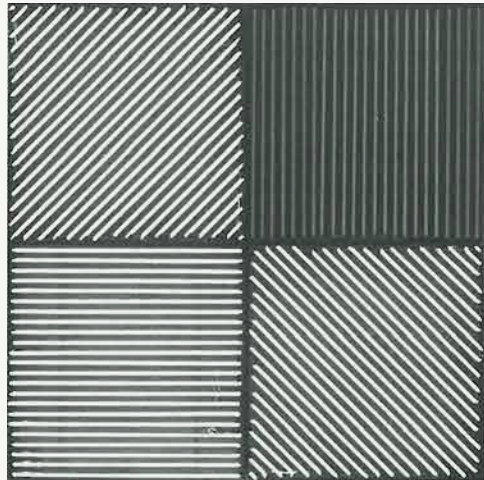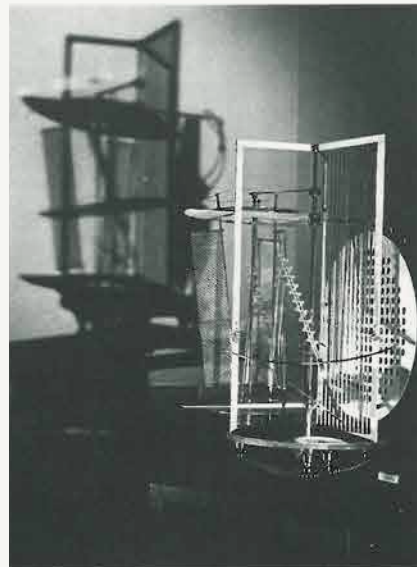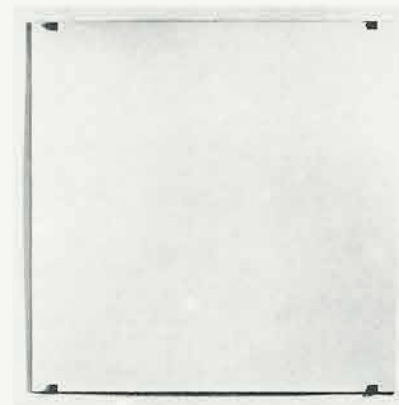
1. László Moholy-Nagy
(Bácsborsód, Hungary, 1895–Chicago, 1946)

*Licht-Raum-Modulator* (Light-Space-Modulator)
1922–1930
1930 (replica)
Mobile constructed out of various metals,
synthetic materials, and wood,
with an electric motor.
1.51 × 0.70 × 0.70 m
Eindhoven, Stedelijk van Abbe Museum.

The design and construction of this machine
occupied Moholy-Nagy from 1922 to 1930,
when he was at the Bauhaus in Berlin and
Weimar. 'But the basic idea—to capture light
in its structure and thus to render visible its
power to modulate space and time—was
more important than the realisation. His
experiments with the *Licht-Maschine* [*Light
machine*], his *Lichtrequisit* [*Luminous Device*],
his *Lightprop* or *Light-Space-Modulator*—to
give only a few of the names that emphasise
the experimental character of his œuvre—
were an influence on his later work in the
domain of cinema, theatre, exhibitions, and
scenography' (Hannah Weitemeier, *Licht-
Visionen, Ein Experiment von Moholy-Nagy*
[Berlin: Bauhaus-Archiv, 1972]).

2. Lucio Fontana
(1899, Rosario da Santa Fé—Commabio, 1968)

*Ambiente*
1967
Phosphorescent colours on canvas,
black light (sculptural installation).
Around 3 × 2 × 3 m.
Lyon, Musée des Beaux-Arts,
Palais Saint-Pierre-Art contemporain.

From 1949 Lucio Fontana thought in terms
of what he called 'spatial environments'.
For him this was a kind of 'first attempt to
liberate oneself from a static plastic form'.
In 1950 Fontana was to realise what he
defined as 'the permanent search for a form
and a concept that could render plausible
the "White Manifesto"'.

3. François Morellet
(Cholet 1926–), lives between Cholet,
Paris and New York

*Parallèles de néon 0°, 45°, 90°, 135°
avec quatre rhythmes interférents*
1963
Neon and wood.
Paris, collection Galerie Liliane
and Michel Durand-Dessert.

'Morellet', writes Michel Frizot in the catalogue
for the exhibition '72' at the Grand Palais,
'[...] sees himself as merely the "player of the
game": a game in which the great advertising
neons of our cities espouse a concise and
direct vocabulary in English and French.
Between wry scepticism and febrile activism,
between reason and chance, Morellet's
approach combines irony and jokes in search
of an identification with the spectator, by
means of an art without constraint that makes
no concessions to traditional aesthetics or
classical unicity.'

4. Takis
(1925, Athens–), lives in Paris

*La Méduse*
1980
Set of electromagnets.
2.20 × 0.60 × 0.40 m.
Paris, Musée National d'Art Moderne, Centre
Georges Pompidou, gift of Alexandre Iolas.
AM 1980–547

For Takis, the approach of the artist marries
with that of the scientist. His first *Signals*,
around 1955, were immobile and looked
like erect antennae. Later, Takis sought
to visualise energy through the use of the
effects of magnetism. In *La Méduse*,
he uses 'the possibilities of the fluorescence
of gases, imprisoning its sidereal glow
within the fragile glass bulb.'

5. Dan Flavin
(New York, 1933–), lives in New York

*To Donna*
1971
Four fluorescent lighting tubes, yellow,
blue, and pink, painted metal support.
290 × 240.5 × 240 cm
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou, gift of Leo Castelli.
AM 1977–210

'My icons,' Flavin wrote, 'differ from a
Byzantine Christ held in majesty; they are
dumb—anonymous and inglorious. They're
as mute and undistinguished as the run of our
architecture. My icons do not raise up the
blessed savior in elaborate cathedrals, they
are constructed concentrations celebrating
barren rooms. They bring a limited light.'

6. Sam Moree
(1948– )

*Cartesian Memories*
1983
30.5 × 160 cm.
Hologram and neon.
New York, collection of the artist.

7. Robert Ryman
(1930– )

*Midland I*
1976
1.22 × 1.22 m.
Oil and synthetic resin on blue Acrylivin with
four cadmium-plated steel bolts and fasteners.
Unsigned, undated.
On reverse of canvas, top left: Ryman 76,
and on the right: Midland I
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou.
AM 1978–800 P

# bodiless painter

What point is there in painting a 'motif' by applying paint by hand, with a brush, onto a prepared canvas? Better to take a slide of the same motif and project it onto a photosensitised canvas. No more gesture, no more 'facture'. The style will be photographic. The painting body is placed outside the circuit of painting. And the product of painting can be multiplied.
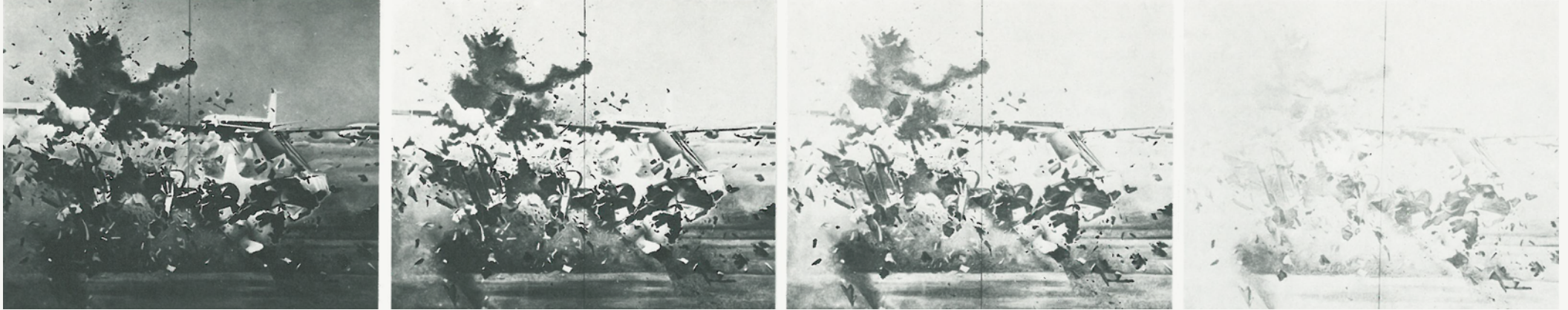


| raw material [matériau] | bodiless painter |
|---|---|
| matrix [matrice] | |
| hardware [matériel] | auto-generation |
| content [matière] | |
| maternity [maternité] | |

Image: Jacques Monory, *Explosion*, 1973.
The painter compares the two manners
of image making. Catastrophe of painting?

Jacques Monory
(1934– )
lives in Cachan

*Explosion*
1973
One part painted, three parts on canvas
treated with photosensitive solution, coloured.
Four panels of 2.28 × 1.95 m.
Paris, collection of Mr and Mrs Adrien
Maeght.

'Saying to himself: *Why paint, why not
directly transcribe the image onto the
pictorial surface?*—obviously a decisive
question since it involves the disappearance
of the painter's body in the chromatic
inscription set-up [...] he takes a photo-
sensitised canvas [...] and projects the slide
of his photographic montage onto it. Here,
then, we have a first object of the production
process, from which the caressing hand
is absent. Then, taking another canvas
(not photo-sensitised), and again projecting
the same slide onto it, he paints as if in the
customary way, tracing the indications of
lines and values on the virtual image, then
covering the surface, using as a model
(more a guide than a constraint) a photo
of the same composition held in his left hand.
A second object, then, produced according
to the painter's habitual method, where the
work of the body itself intervenes, not just
in producing little differences as regards the
*motif*, but through an extremely active play
with values. The comparison between the
two products is striking: they are separated
by a huge displacement. The photo-
sensitised canvas (which functions like the
paper used for processing) has *recorded*
the transformation process of light energy
into points, and this recording cannot occur
without a loss of value. Next to this canvas,
the painted one is bursting with energy,
with seductive and nostalgic force.

The reason is that in the first work, the means
of reproduction have operated in conformity
with their principle which is only replication
[...]'.

Extract from Jean-François Lyotard,
*The Assassination of Experience by Painting,
Monory* [1984], tr. R. Bowlby, J. Bouniort
and P.W. Milne (Leuven: Leuven University
Press, 2013).

# all kinds of copies

Anything can be photocopied. But the resemblance of the copy to the original depends upon the angle and duration of exposure. The result may be unrecognisable. Unknown faces reveal the monstrous within the familiar. Advantage of the imprint over the supposed original, of perverse technique over direct perception, of the unconscious over 'reality'.
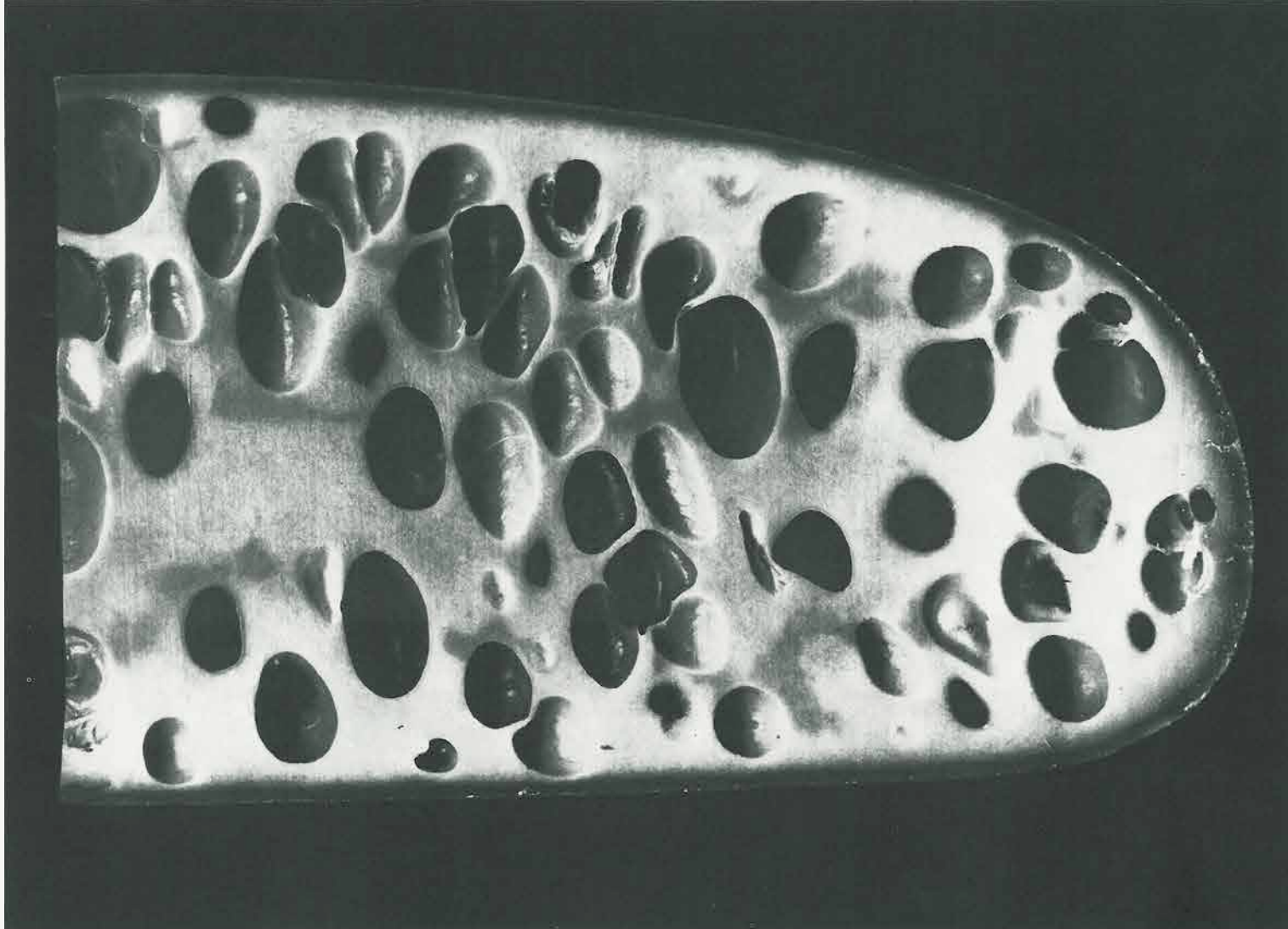


Liliane Terrier, photocopy of
a slice of emmental, 1984.

| raw material [matériau] | all kinds of copies |
|---|---|
| matrix [matrice] | |
| hardware [matériel] | |
| content [matière] | trace of a trace |
| maternity [maternité] | all kinds of authors |

Transparent cubicle exhibiting a selection of objects, and containing a photocopier. An assistant makes photocopies of these objects on the request of visitors or at their own choice. Simultaneously, a telecopier linked to the Centre Georges Pompidou's Atelier des Enfants sends other compositions. The photocopies are put up, exhibited, framed: made into an archive of the experiment.

## Design and production
Liliane Terrier and the students of
the workshop 'The matrix-object',
Arts and Technologies of the Image,
Université Paris VIII

## Technical setup
Jean-Louis Boissier

# matrix [*matrice*]

Red: luminous radiation emitted by an object, defined by its wavelength. Middle C: sonorous vibration defined by its pitch. Neutron: a material particle defined by its mass, its spin, and its status in statistical mechanics. The sound *p*: an element (phoneme) of a spoken language, defined by the way it is produced by the phonatory system and its pertinence in the phono-logical structure of that language.

Knowing consists in deciphering an object. We presuppose that this object is a message, and that therefore it is 'written' in a 'language', a code.

The matrix is this language, the 'cipher' of the message. The rationalist attitude: to find the matrix of apparently undecipherable or incomparable phenomena. In this way, genetics discovered that the singular properties of a living individual are sentences in a certain language, the code of DNA. The cave paintings of Altamira and Lascaux are sentences in an iconographic code.

One can use the matrices discovered in this way to construct unprecedented 'sentences' (in genetics, chimeras). One can invent new matrices from which there result pure artefacts (synthetic foods in biofood engineering, paradoxical logics).

Masters of language? Or languages as masters of knowledge and action? In any case, a revolution in our relations with the matrix. Existence and meaning are no longer given by a goddess, but by a structure.

J-F L

# all kinds of skins

The functional overdifferentiation of clothing today seems to obey a strict rationalisation based on performance and efficacity. One that does not exclude, however, a certain code of 'standing out'. Both in leisure and at work.



| raw material [matériau] | second skin |
| --- | --- |
| **matrix [matrice]** | **all kinds of skins** |
| hardware [matériel] | registration |
| content [matière] | |
| maternity [maternité] | speed dressing |

Irving Penn, waiter, Paris.



On stylised mannequins, a number of functional outfits: nuclear and thermal protection, industrial clothing, sport, etc.

Irving Penn, road worker, New York.





Irving Penn, firefighter at a steelworks, New York.

Irving Penn, police officer, New York.

# food ration

The alimentary code assures the general regulation of the relations of society to itself and to nature. Today it tends to be governed by the optimisation of the functions of nutrition. There are many expressions of this optimum. The only acceptable status under these conditions: having a 'good' metabolism.

| raw material [matériau] | |
|---|---|
| **matrix [matrice]** | **food ration** |
| hardware [matériel] | hurried eater |
| content [matière] | |
| maternity [maternité] | precooked-prespoken |

An open refrigerator, small bowls of elementary nutritional constituents: fats, proteins, carbohydrates. On a kitchen table, a microcomputer running dietetic programs.



Standard meals for two astronauts during a space flight.

Software
Jacques Mateos

# all kinds of noises

How can the sounds, including the 'noises', that make up contemporary musics, be written down? Difficulty of a notation without notes. The musical alphabet cannot signify everything, which entails turning to figurative means instead. The score as rebus.



| raw material [matériau] | sung body |
|---|---|
| **matrix [matrice]** | **all kinds of noises** |
| hardware [matériel] | inadvertent musician |
| content [matière] | unrepresentable |
| maternity [maternité] | |

Reproduction in full of a score by Jean-Charles François, *Remarques Pertinentes sur les Crustacés Décapodes*, 1982, for pianist-vocalist and dancer-vocalist.

Jean-Charles François, extract from *Remarques Pertinentes sur les Crustacés Décapodes*, California, 1982.

# living language

The full variety and complexity of molecular functions can be seen at work inside cells: messages, receiver-codes, communication networks, information storage, enabling biochemical recognitions and interactions. We try to understand and interpret the fundamental processes of life in terms of communication and cybernetics applied on the molecular scale.
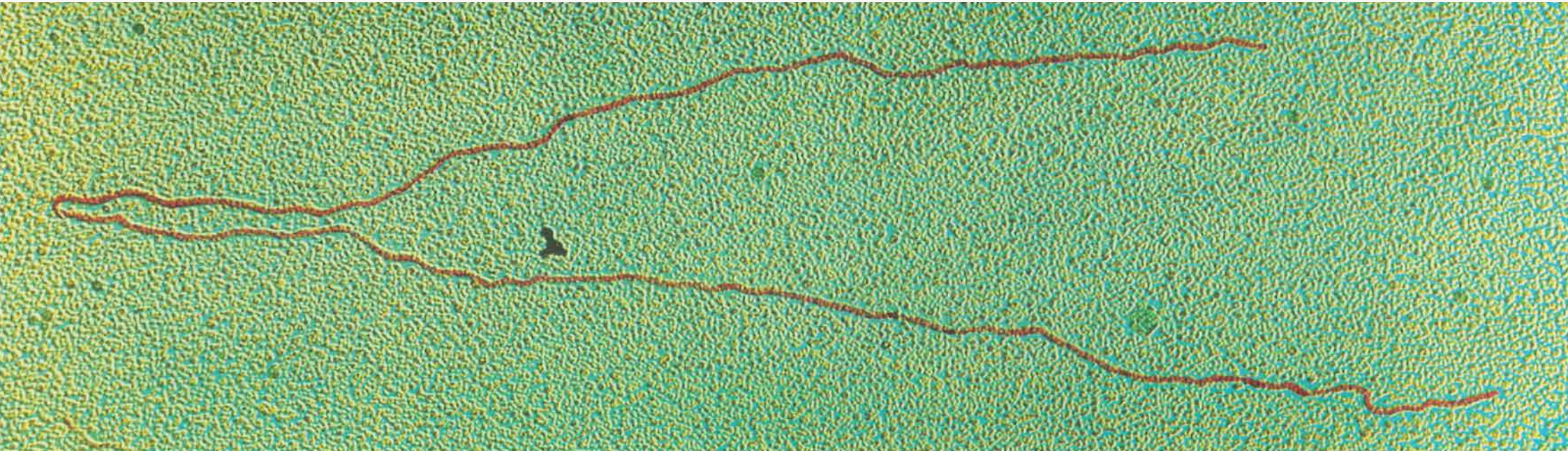


| raw material [matériau] | exploded body |
|---|---|
| **matrix [matrice]** | **living language** |
| hardware [matériel] | |
| content [matière] | reciprocal space |
| maternity [maternité] | the three mothers |

Projection of experiments conducted by Jean-Pierre Ozil and Jacek Modlinski at CNRZ, on cow embryos and rabbit ova. Decoding the language of molecules, knowing how to read it, learning to write it. On screen, the genetic code.



1. One of the 46 chromosomes in the core of this human cell (around 1 micron) made up of proteins and DNA.

2. Strand of DNA (0.1 micron).

**Photo and document recto**
1. CNRI
2. Extract from Charles
Eames and Philip Morrison,
*Powers of Ten* (New York:
Scientific American Library,
1984). All rights reserved.

# chess game

Tracing back from a series of apparently chance events to the rules of the game (the matrix) that govern it. An event only takes place if it is permitted within the matrix (for example, the set of lexical and syntactical rules of the game of chess) and by the situation or context (the state of the game at a given moment).

Edgar Allan Poe, extracts from 'The Gold Bug'.

---

Ici, Legrand, ayant de nouveau chauffé le vélin, le soumit à mon examen. Les caractères suivants apparaissaient en rouge, grossièrement tracés entre la tête de mort et le chevreau :

53 ‡ ‡ † 305)6* ; 4826)4 ‡ .)4 ‡ ) ;806* ; 48 + 8q 60)85 ; 1 ‡ (; : ‡ *8 + 83(88)5* ‡ ; 46(; 88*96* ? ; 8 ‡(;485) ;5* + 2 : *‡ ( ;4956*2(5* –4)8q8* ;4069285) ;)6 + 8)4 ‡ ‡ ; 1(‡9; 48o81 ;8:8 ‡‡1 ;48 + 85 ;4)485 + 528806*81 (‡ 9 ;48 ; (88 ;4( ‡ ? 34 ; 48)4 ‡ ; 161 ; :188 ; ‡ ?;

— Mais, dis-je, en lui rendant la bande de vélin, je n'y vois pas plus clair. Si tous les trésors de Golconde devaient être pour moi le prix de la solution de cette énigme, je serais parfaitement sûr de ne pas les gagner.
— Et cependant, dit Legrand, la solution n'est certainement pas aussi difficile qu'on se l'imaginerait au premier coup d'œil. Ces caractères, comme chacun pourrait le deviner facilement, forment un chiffre, c'est-à-dire qu'ils présentent un sens ; mais, d'après ce que nous savons de Kidd, je ne devais pas le supposer capable de fabriquer un

LE SCARABÉE D'OR                                    115

échantillon de cryptographie bien abstruse. Je jugeai donc tout d'abord que celui-ci était d'une espèce simple, — .tel cependant qu'à l'intelligence grossière du marin il dût paraître absolument insoluble sans la clef.
— Et vous l'avez résolu, vraiment ?
— Très aisément ; j'en ai résolu d'autres dix mille fois plus compliqués. Les circonstances et une certaine inclination d'esprit m'ont amené à prendre intérêt à ces sortes d'énigmes et il est vraiment douteux que l'ingéniosité humaine puisse créer une énigme de ce genre dont l'ingéniosité humaine ne vienne à bout par une application suffisante. Aussi, une fois que j'eus réussi à établir une série de caractères lisibles, je daignai à peine songer à la difficulté d'en dégager la signification.
« Dans le cas actuel, — et, en somme, dans tous les cas d'écriture secrète, — la première question à vider, c'est la langue du chiffre : car les principes de solution, particulièrement quand il s'agit des chiffres les plus simples, dépendent du génie de chaque idiome, et peuvent être modifiés. En général, il n'y a pas d'autre moyen que d'essayer successivement, en se dirigeant suivant les probabilités, toutes les langues qui vous sont connues, jusqu'à ce que vous ayez trouvé la bonne. Mais, dans le chiffre qui nous occupe, toute difficulté à cet égard était résolue[214] par la signature.

---

Le rébus sur le mot *Kidd* n'est possible que dans la langue anglaise. Sans cette circonstance, j'aurais commencé mes essais par l'espagnol et le français, comme étant les langues dans lesquelles un pirate des mers espagnoles[215] avait dû le plus naturellement enfermer un secret de cette nature. Mais, dans le cas actuel, je présumai que le cryptogramme était anglais.
« Vous remarquez qu'il n'y a pas d'espaces entre les mots. S'il y avait eu des espaces, la tâche eût été singulièrement plus facile. Dans ce cas, j'aurais commencé par faire une collation et une analyse des mots les plus courts, et, si j'avais trouvé, comme cela est toujours probable, un mot d'une seule lettre, *a* ou *I* (un, je) par exemple, j'aurais considéré la solution comme assurée. Mais, puisqu'il n'y avait pas d'espaces, mon premier devoir était de relever les lettres prédominantes, ainsi que celles qui se rencontraient le plus rarement. Je les comptai toutes, et je dressai la table que voici :

116                HISTOIRES EXTRAORDINAIRES

Le caractère 8 se trouve 33 fois.

| » | | » | 26 » |
| » | 4 | » | 19 » |
| » | ‡ et ) | » | 16 » |
| » | * | » | 13 » |
| » | 5 | » | 12 » |
| » | 6 | » | 11 » |
| » | + et 1 | » | 8 » |
| » | o | » | 6 » |
| » | 9 et 2 | » | 5 » |
| » | : et 3 | » | 4 » |
| » | ? | » | 3 » |
| » | q | » | 2 » |
| — et . | | » | 1 » |

« Or, la lettre qui se rencontre le plus fréquemment en anglais est *e*. Les autres lettres se succèdent dans cet ordre : *a o i d h n r s t u y c f g l m w b k p q x z*. E prédomine[216] si singulièrement[217] qu'il est très rare de trouver une phrase d'une certaine longueur dont il ne soit pas le caractère principal.
« Nous avons donc, tout en commençant, une base d'opérations qui donne quelque chose de mieux qu'une conjecture. L'usage général qu'on peut faire de cette table est évident ; mais, pour ce chiffre particulier, nous ne nous en servirons que très médiocrement. Puisque notre caractère dominant est 8, nous commencerons par le prendre pour l'*e* de l'alphabet naturel. Pour vérifier cette supposition, voyons si le 8 se rencontre souvent double ; car l'*e* se redouble très fréquemment en anglais, comme par exemple dans les mots : *meet, fleet, speed, seen, been, agree*, etc. Or, dans le cas présent, nous voyons qu'il n'est pas redoublé moins de cinq fois, bien que le cryptogramme soit très court.
« Donc 8 représentera *e*. Maintenant, de tous les mots de la langue, *the* est le plus usité ; conséquemment, il nous faut voir si nous ne trouvons pas répétée plusieurs fois la même combinaison de trois caractères, ce 8 étant le dernier des trois. Si nous trouvons des répétitions de ce genre, elles représenteront très probablement le mot *the*. Vérification faite, nous n'en trouvons pas moins de 7 ; et les caractères sont ;48. Nous pouvons donc supposer que ; représente *t*, que 4 représente *h*, et que 8 représente *e*, — la valeur du dernier se trouvant ainsi confirmée de nouveau. Il y a maintenant un grand pas de fait.

---

LE SCARABÉE D'OR                                    117

« Nous n'avons déterminé qu'un mot, mais ce seul mot nous permet d'établir un point beaucoup plus important, c'est-à-dire les commencements et les terminaisons d'autres mots. Voyons, par exemple, l'avant-dernier cas où se présente la combinaison ; 48, presque à la fin du chiffre. Nous savons que le ; qui vient immédiatement après est le commencement d'un mot, et des six caractères qui suivent ces *the*, nous n'en connaissons pas moins de cinq. Remplaçons donc ces caractères par les lettres qu'ils représentent, en laissant un espace pour l'inconnu :

*t eeth*.

« Nous devons tout d'abord écarter le *th* comme ne pouvant pas faire partie du mot qui commence par le premier *t*, puisque nous voyons, en essayant successivement toutes les lettres de l'alphabet pour combler la lacune, qu'il est impossible de former un mot dont ce *th* puisse faire partie. Réduisons donc nos caractères à

*t ee*,

et reprenant de nouveau tout l'alphabet, s'il le faut, nous concluons au mot *tree* (arbre) comme à la seule version possible. Nous gagnons ainsi une nouvelle lettre, *r* représentée par (, plus deux mots juxtaposés, *the tree* (l'arbre). Un peu plus loin, nous retrouvons la combinaison ; 48, et nous nous en servons de terminaison à ce qui précède immédiatement. Cela nous donne l'arrangement suivant :

*the tree* ; 4)‡ ?34 *the*,

ou, en substituant les lettres naturelles aux caractères que nous connaissons,

*the tree thr* ‡ ?3*h the*.

Maintenant, si aux caractères inconnus nous substituons des blancs ou des points, nous aurons :

*the three thr... h the*,

et le mot *through* (par, à travers) se dégage pour ainsi dire de lui-même. Mais cette découverte nous donne trois lettres de plus, *o, u* et *g*, représentées par ., ? et 3.

---

118                HISTOIRES EXTRAORDINAIRES

« Maintenant, cherchons attentivement dans le cryptogramme des combinaisons de caractères connus, et nous trouverons, non loin du commencement, l'arrangement suivant :

83(88, ou *egree*,

qui est évidemment la terminaison du mot *degree* (degré), et qui nous livre encore une lettre *d* représenté par ‡.
« Quatre lettres plus loin que le mot *degree*, nous trouvons la combinaison

;46(;88

dont nous traduisons les caractères connus et représentons l'inconnu par un point[218] ; cela nous donne :

*th.rtee*,

arrangement qui nous suggère immédiatement le mot *thirteen* (treize), et nous fournit deux lettres nouvelles, *i* et *n* représentées par 6 et *.
« Reportons-nous maintenant au commencement du cryptogramme, nous trouvons la combinaison

53 ‡ ‡ †.

Traduisant comme nous avons déjà fait, nous obtenons

*.good*,

ce qui nous montre que la première lettre est un *a*, et que les deux premiers mots sont *a good* (un bon, une bonne).
« Il serait temps maintenant, pour éviter toute confusion, de disposer toutes nos découvertes sous forme de table[219]. Cela nous fera un commencement de clef :

| 5 | représente | a |
| ‡ | | d |
| 8 | | e |
| 3 | | g |
| 4 | | h |
| 6 | | i |
| * | | n |
| † | | o |
| ( | | r |
| ; | | t |
| | | u |

Ainsi, nous n'avons pas moins de onze des lettres les plus importantes, et il est inutile que nous poursuivions la solution.

---

Chessboard on a human scale, game of enlightenment. Upon entry, on screen, the mathematical principle of the matrix. Upon exit, on a monitor, transmitted image of a chess game underway on an invisible electronic board. The visitors walk across the chessboard. As they pass through, they involuntarily illuminate the squares occupied by pieces in the game that is being played behind the scenes. The visitor acts as the revealer of a situation whose development is subject to the laws of the matrix.

| raw material [matériau] | |
| --- | --- |
| **matrix [matrice]** | **chess game** |
| hardware [matériel] | auto-generation |
| content [matière] | |
| maternity [maternité] | precooked-prespoken |

**Documents recto**
Extracts from Edgar Allan
Poe, 'Le scarabée d'or',
*Histoires Extraordinaires*
(Paris: Garnier, 1955).

**Thanks to**
MB France

# registration

Numbers can be used to classify all possible states of matter. They enable us to give an exclusive and exhaustive description yielding the identification and classification of any individual whatsoever.

| | |
|---|---|
| raw material [matériau] | indiscernibles |
| **matrix [matrice]** | **registration** |
| hardware [matériel] | |
| content [matière] | |
| maternity [maternité] | currency of time |

Digitally controlled slide projection. A series of numbers symbolising the planet, the nation, gender, etc. can be used to call up a fictional identity card. A human identity for the earth, a mineral identity when it refers to another celestial location. The combination of a small number of digits is enough to identify an individual. On the screen, an explanation of the meaning of 'quaternions' in theoretical physics.
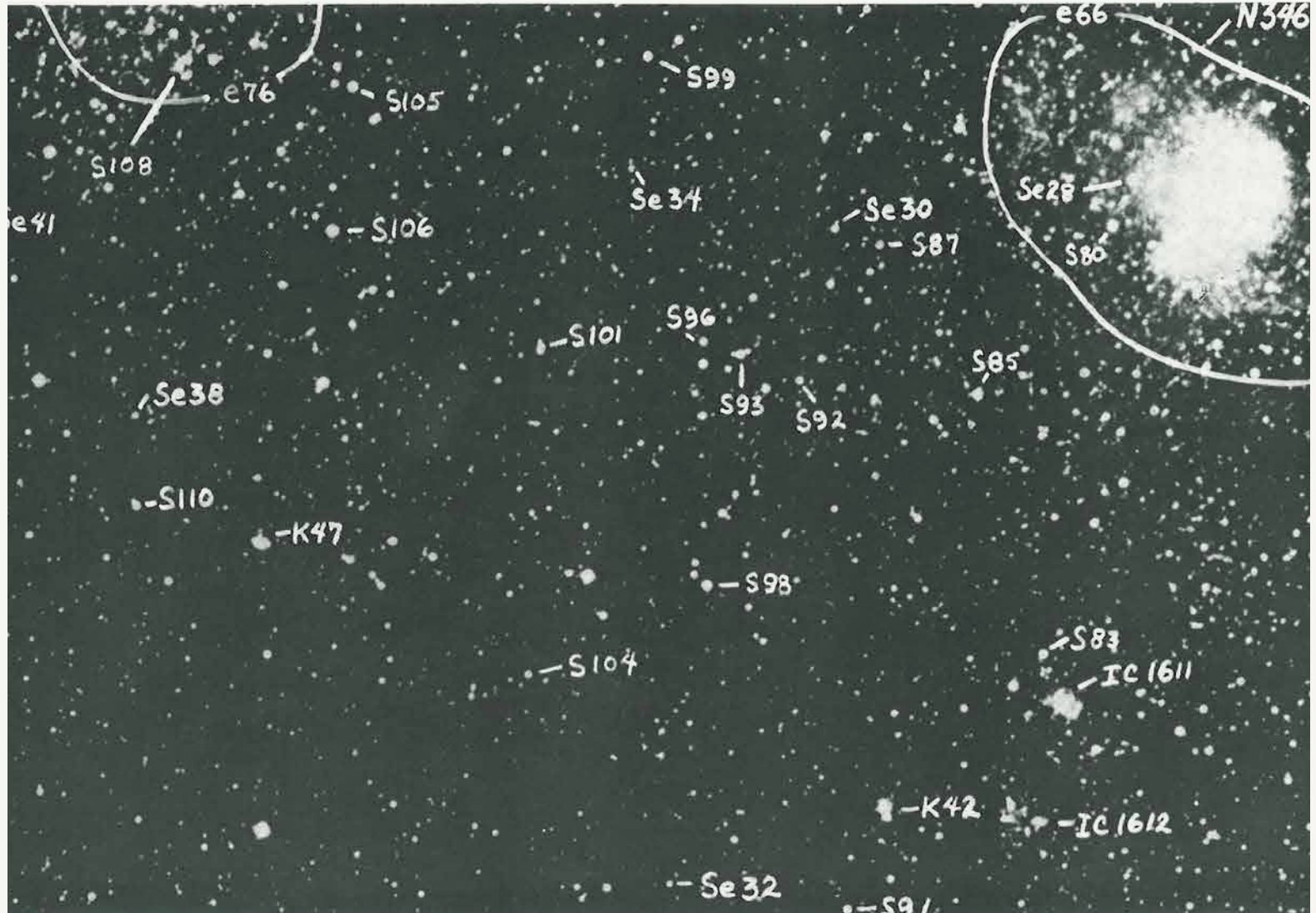


Part of the sky in the southern hemisphere, with registration numbers of celestial bodies.

**Graphics**
Pascale Testanière

**Photos**
IRSID
Collection of the Musée de l'Homme

**Editing**
Jean-Pierre Six

# hidden variables

Through a questionnaire about the visitor, a hidden variable of the exhibition is revealed: its audience. An (in situ) research study on the set of rules (the matrix) governing the phenomenon 'visiting *Les Immatériaux*'. Impossibility of saturating the matrix, isolating the 'contextual' system.
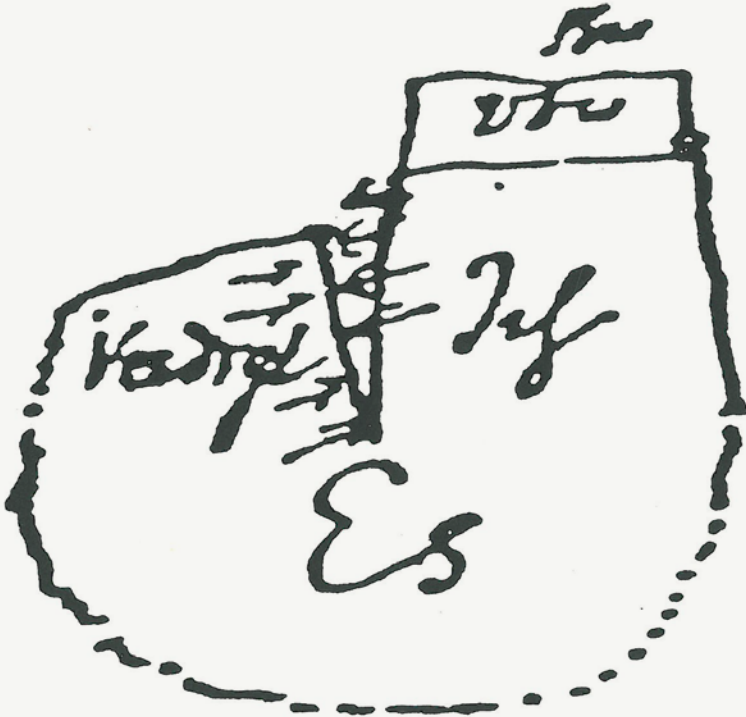


Primitive schema of the Id, from Freud's letter to Groddeck, 17 April 1921.

| | |
|---|---|
| raw material [matériau] | |
| **matrix [matrice]** | **hidden variables** |
| hardware [matériel] | |
| content [matière] | unrepresentable |
| maternity [maternité] | |

Microcomputer with statistical software and graphic display. Questions allowing the visitor to discover a profile of the audience. Statistical treatment reveals that visitors are determined according to unknown variables. Yet others still must be acting beyond our control. On screen, an explanation of the principle of hidden variables.
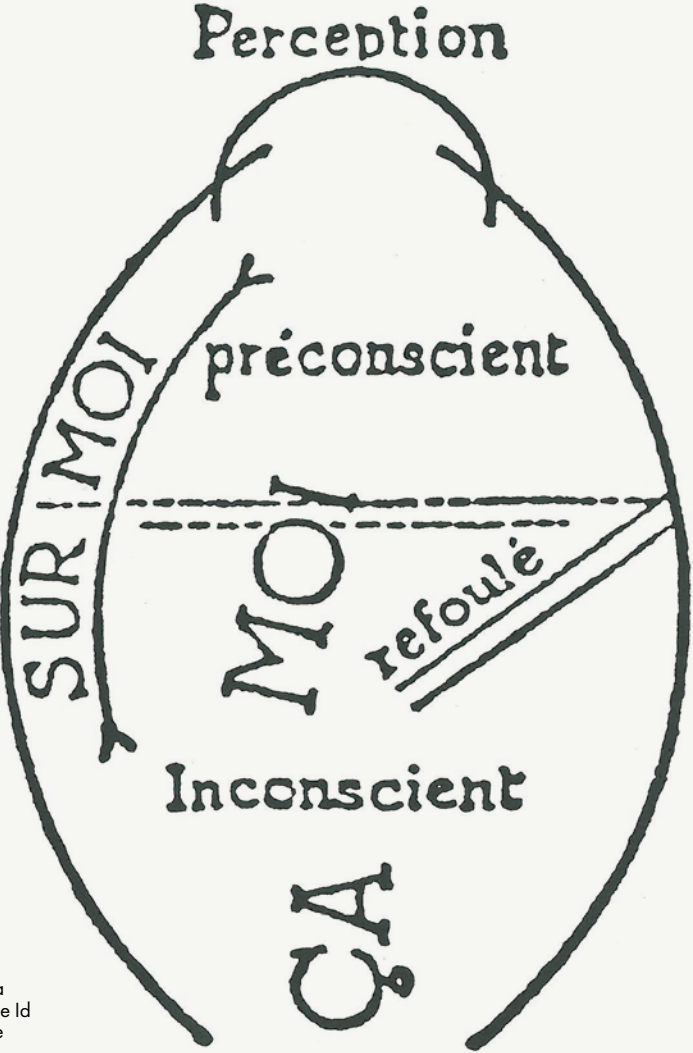


Freud's mature schema from 1932, situating the Id in relation to the whole psychic apparatus.

# little invisibles

Multiplication of the objects visible to the human eye thanks to hardware [*matériels*] enabling the capture, recording, and reproduction of invisible waves. The human eye can now access information that falls short of or is beyond the 'natural' limits of its perceptual field. Technoscientific prostheses modify the matrix of visibility, in doing so extending the register of what is 'given' visually.

| | |
|---|---|
| raw material [matériau] | luminescent painting |
| **matrix [matrice]** | **little invisibles** |
| hardware [matériel] | |
| content [matière] | reciprocal space |
| maternity [maternité] | |

Staging of three spaces with the same decorative motif. A first space lit alternately with natural light and monochromatic light. A second space alternately lit with natural light and UV light which allows the invisible décor to be seen by the naked eye. A third space, lit with natural light: an infrared camera captures the décor, invisible to the naked eye, and transmits it to a nearby monitor.
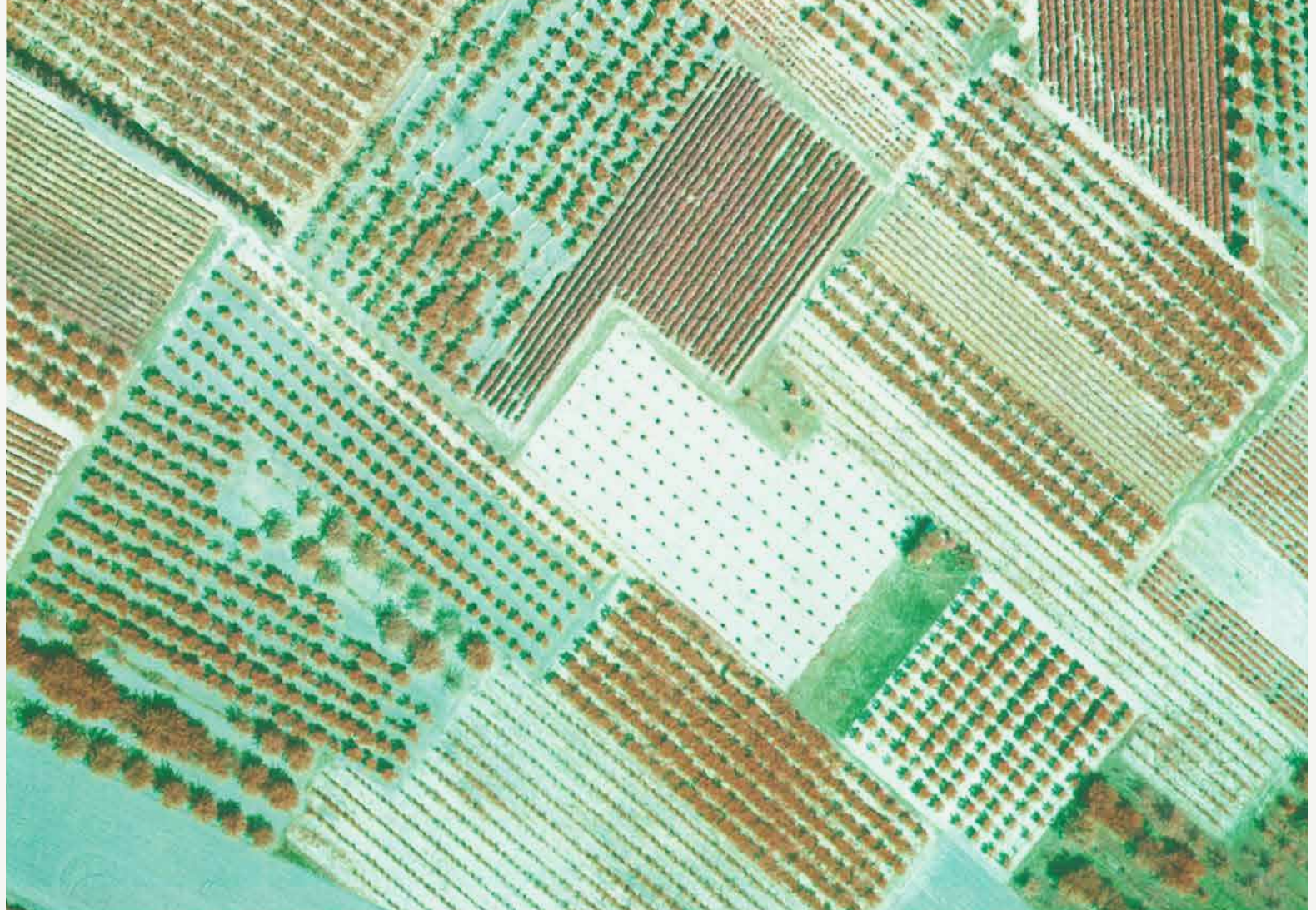


Thermal imaging of fields
in the Avignon region.

# flat architecture

Construction materials can be produced on demand—that is to say, for a particular project. The projection of a building on paper is now the essential component of the architectural message. The architect's drawing frees itself of the constraints of 'building' and approaches those of 'painting'. A slippage of one code toward another which renders uncertain the distinction between the two messages, architectural and pictorial.
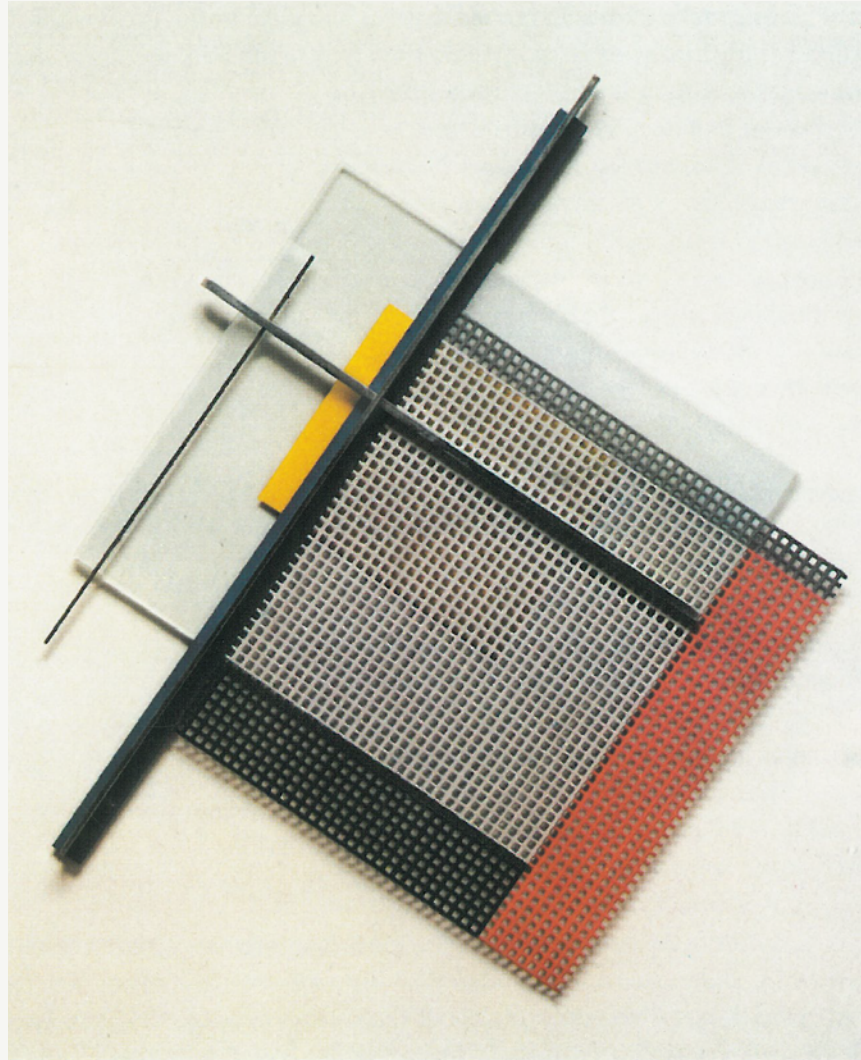


| raw material [matériau] | |
|---|---|
| **matrix [matrice]** | **flat architecture** |
| hardware [matériel] | |
| content [matière] | inverted reference |
| maternity [maternité] | neglected terrain |

Plan-drawing by Zaha Hadid, drawings by Rem Koolhaas, *Isometrische Übersicht der Gesamtanlage, Triptychon*, 1982, and Piet Zwart, *Definitive design for celluloid manufacturer's stand*, 1921; architectural maquettes by Kazimir Malevich, *Alpha*, 1923, *Beta*, before 1926. It seems that there is no distinction between an architect's drawing and a painter's drawing.

César Domela,
*Construction*, 1929.

Piet Zwart
(Zaandijk, Holland, 1885–1977).

*Definitive design for celluloid manufacturer's stand*
1921
Paper and card, ink, pencil, watercolour
45.5 × 64.7 cm
The Hague, collection of the Haags Gemeentemuseum.

Although he did not belong to the De Stijl group, Piet Zwart worked with J. Wils before joining the agency of H.P. Berlage. The 1921 exhibition stand has been seen as an anticipation of the ideas of De Stijl. Lines, planes, and colours signify, beyond an interpretation in terms of 'space', a mode of projection independent of the materials used to constitute the site. Architecture frees itself from auto-representation, from the art of speaking that founded its signifying status.

Rem Koolhaas
(1944– )
Founded OMA (Office for Metropolitan Architecture) in 1975 with Elia Zenghelis

*Isometrische Übersicht der Gestamtanlage, Triptychon*, 1982
Three pieces of 75 × 123 cm
Rotterdam, Office for Metropolitan Architecture

The axonometric triptych for Rotterdam is the real site of architecture. The built version would only be a representation of it using materials which, as such, disappear, a fatally inadequate and perhaps unnecessary reproduction. Taking the form of a painting, the architect's drawing imposes its presence as a thing itself, negating its status as a representation.

Kazimir Malevich
(Kiev 1878–Leningrad, 1935)

*Architectones
Alpha*
1923
Plaster. One original element,
99 remade elements (including 5 in glass)
33 × 37 × 84.5 cm
Paris, Musée National d'Art Moderne, Centre Georges Pompidou
AM 1978–876

*Beta*
before 1926
Plaster. 29 original elements,
40 remade elements
27.3 × 59.5 × 99.3 cm
Paris, Musée National d'Art Moderne, Centre Georges Pompidou
AM 1978–877

The *architectones* have no predetermined destination, and are not the result of any programme, even though various types of building could be read in them. Here all that are indicated are possibilities, potentials of a becoming-architecture: the object exists before being a project.

Zaha Hadid
(Iraq, 1950– )

The Three Towers
1985
dimensions 1 × 2 m
London, collection of the artist

The bias toward the graphic is innovative not so much in its technique as in terms of its status: the architect and her colleagues agree in regarding this type of representation as a project, so that these 'graphical intermediaries' further designate the lack of interest in architecture as finished object or result.

# hardware [*matériel*]

The vibrating element (air, water, mineral) that enables the transmission of a sound (vibration) constitutes a 'natural' piece of hardware [*matériel*]. The human auditory system, receiver of this sound, is a piece of hardware perfectly adapted to capture sound conveyed in this way.

Hardware: devices for the transmission and capture of a message which carry it to its destination.

As technoscience develops, prostheses proliferate and become more complex. They deliver to us vibrations (messages) from beyond our grasp: spectrographs of invisible stars, radiology, scanners, electron microscopes, chromatographs.... The old 'elements' and old 'receivers' are decommissioned. Messages run on all wavelengths, at speeds approaching that of light.

The planet's surface is full of antennas plunged into fields of transmission, covered with information transmission networks. The stars are workshops for the transformation of matter, the earth is becoming a laboratory of cosmic knowledge.

What is at stake: to minimise the delay between the reception of a message and its instrumental output, to operate in 'real time'. Applications to music, food, images, the home. We encounter this paradox: we can go as fast as we want, but the present moment remains ungraspable.

And this one: not all messages are destined for us, we steal them. Adam, Prometheus, and Faust paid dearly for the desire to know, for their indiscretion, their imposture. If we go unpunished, does that mean that the gods are dead?

J-F L

# invisible man

Making available to the senses the implication of the invisible in the visible. The visual image that results from the holographic procedure places the emphasis on the precarious aspect of the 'seen thing'. An uncertainty that is reflected in the seeing subject: isn't he invisible to himself without the aid of some specular device [*matériel*]?
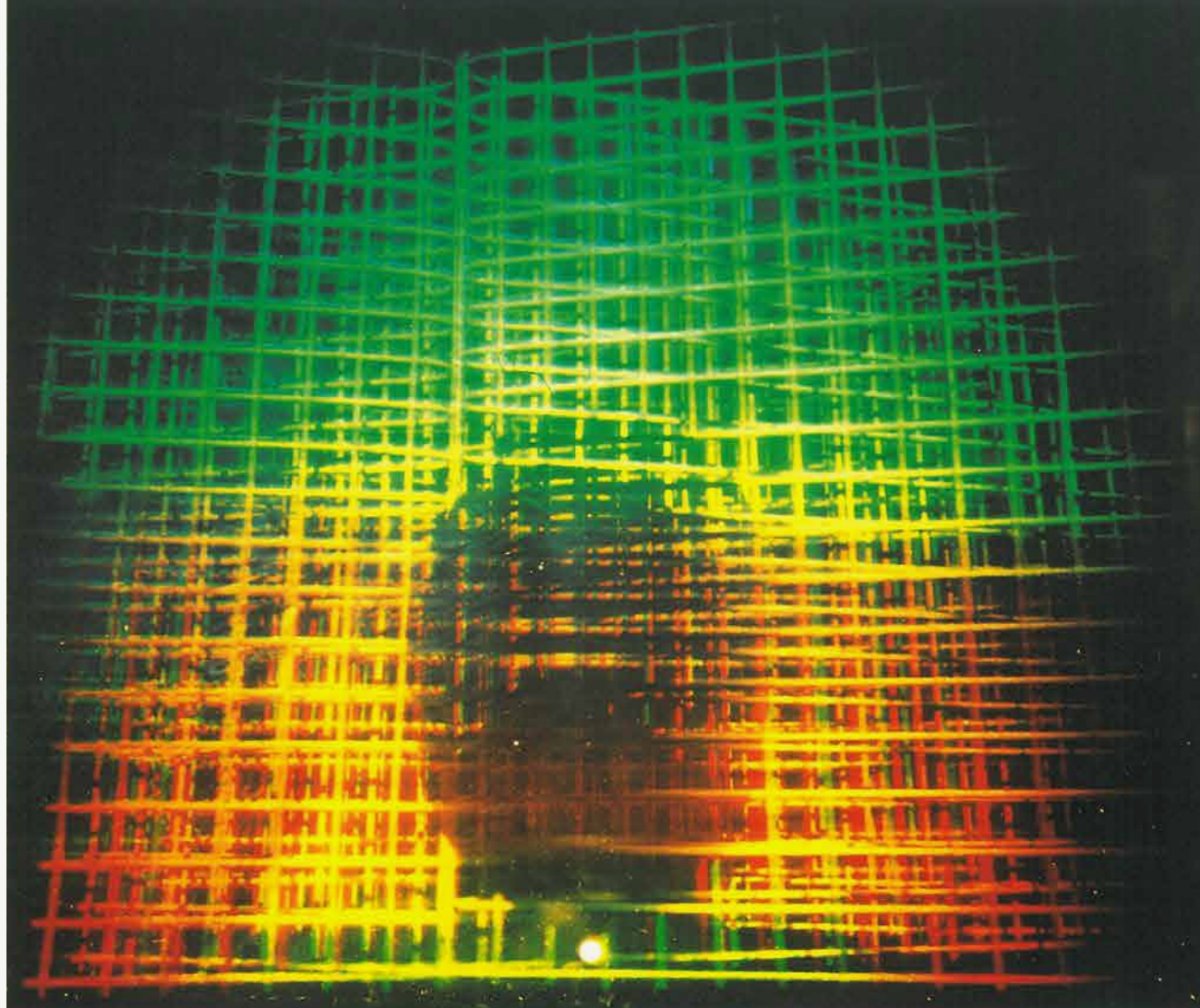


| raw material [matériau] | the angel |
|---|---|
| matrix [matrice] | |
| **hardware [matériel]** | **invisible man** |
| content [matière] | |
| maternity [maternité] | |

Two holograms:
1. Alexander, *Head in a 4 Dimensional Environment*, 1982.
2. Stephen Benton, *Rind II*, 1977.

Photos recto
1. Alexander, *Head
in a 4D environment,* 1982
50 × 60 cm
Sydney, collection
of the artist.
2. Stephen Benton,
*Rind II,* 1977
30.5 × 30.5 cm
London, collection
of Eve Ritscher
Photo: Linda E. Law

# compartment

Decline of the living space as a site of identification and enjoyment, emergence of environments calculated to provide the requisite organic functions? A prosthetic habitat for a body with no dimensions other than the purely functional?
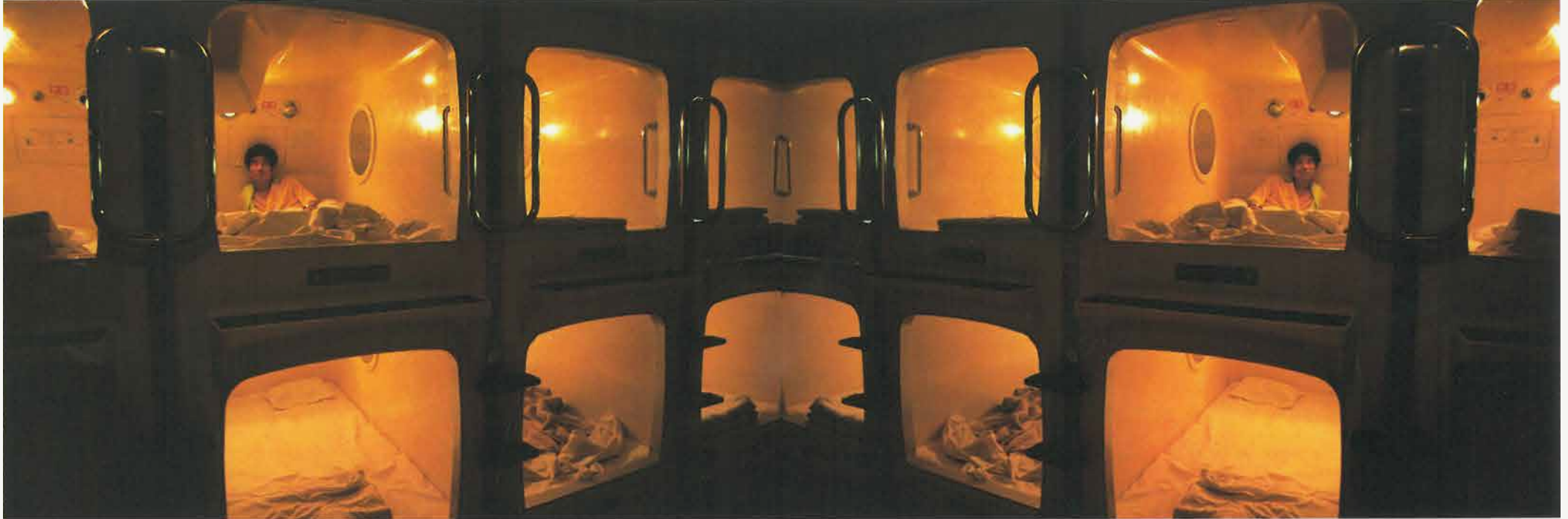


Japanese 'sleeping cell'.

| raw material [matériau] | second skin |
|---|---|
| matrix [matrice] | all kinds of skins |
| **hardware [matériel]** | **compartment** |
| content [matière] | |
| maternity [maternité] | speed dressing |

Japanese 'sleeping cell' unit with radio, television, telephone, air conditioning.
Restorative sleep as the only consideration.

# hurried eater

Customs and rituals of eating lose ground in contact with functionalised lifestyles. But they gain a nostalgic status. Mealtimes are not a cultural performance any longer when what is essential is just to gain energy and time.



Stockbrokers in a German stock exchange.

| raw material [matériau] | |
|---|---|
| matrix [matrice] | food ration |
| **hardware [matériel]** | **hurried eater** |
| content [matière] | |
| maternity [maternité] | speed dressing |

In the four place settings on a white table, projection of different standard meals: family meal, meal for a special occasion, everyday meal, fast food.

**Direction**
Catherine Testanière

**Technical Direction**
Patrick Arnold

**Photography**
Georges Meguerditchian

# inadvertent musician

A simple idea: every movement is a potential source of music. A computer and a synthesizer transform the walking of the visitor into music.

| raw material [matériau] | sung body |
|---|---|
| matrix [matrice] | all kinds of noises |
| **hardware [matériel]** | **inadvertent musician** |
| content [matière] | unrepresentable |
| maternity [maternité] | |

Installation by Rolf Gehlhaar: the visitor, located in space by ultrasonic detectors linked to a computer and a digital synthesizer, triggers and modulates sonic events with their every movement. The nature of the music created depends entirely upon the nature of the visitor's gestures: space is transformed into an immaterial musical instrument.



Bell tower,
near Lhassa, Tibet.

'Son = espace'

**Design, musical composition**
Rolf Gehlhaar

**Director, interactive music**
Philippe Prévot

**Production**
La Villette—Cité des Sciences et de l'industrie

# auto-generation

Automation of the entire process of fabrication. From idea to finished object, an intertwining of software and 'hardware' [*matériel*] such that one no longer knows whether it is the machine that thinks or the mind that fabricates. Creation results more from a condition of high complexity than from a single act.
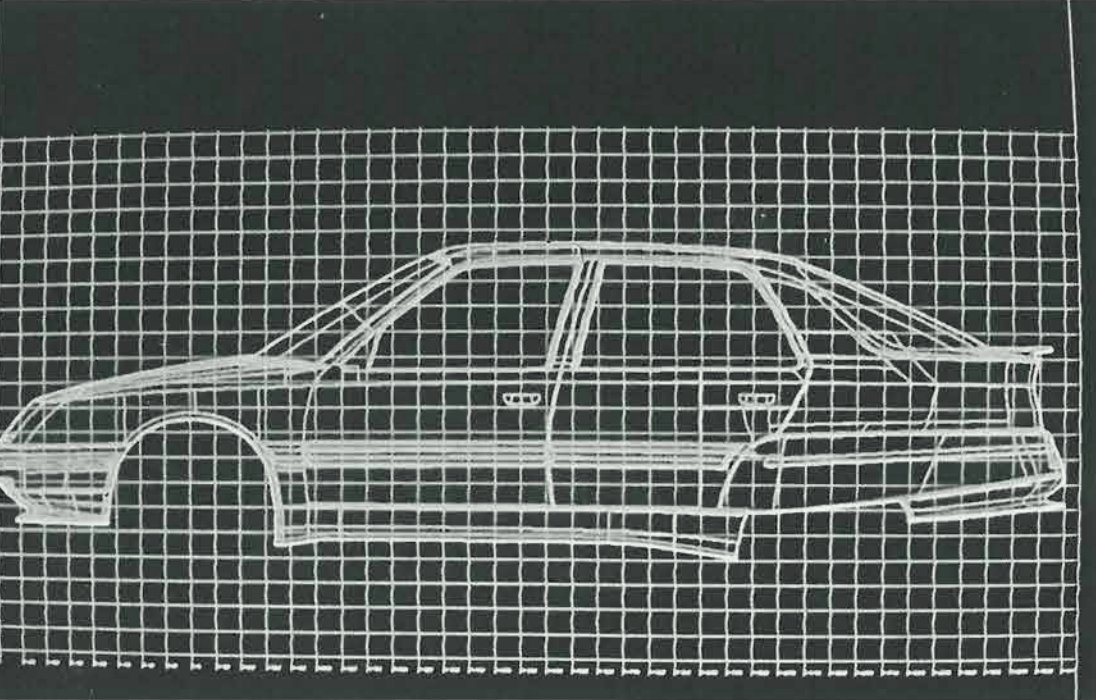


1. CAD 'wireframe' representation of the Vera Plus.

Installation of an object which simulates the cutting out of the front of a car body from a block of pre-cut polystyrene. The car is projected as a 'wireframe' onto the raw material [*matériau*]. A synchronised spotlight follows the computerised path. A video monitor disguised as a control computer displays a series of synthetic images. The robot sculpts the car itself from a drawing of the car, using digital data.



| | |
|---|---|
| raw material [matériau] | |
| matrix [matrice] | |
| **hardware [matériel]** | **auto-generation** |
| content [matière] | calculated images |
| maternity [maternité] | all kinds of authors |

2. CAD volumetric representation of the Vera Plus.

3. Experimental prototype of the Vera Plus.

**Video cameraman**
Michel Grellet

**Technical Direction**
Cédric Bossard

**Photography**
Jean-Claude Planchet

**With the support of**
Groupe PSA

# stellar crucibles

The star as hardware [*matériel*] for the programming and transmutation of elements. Birth, life, and death of stars themselves in the cosmic laboratory of the heavens.
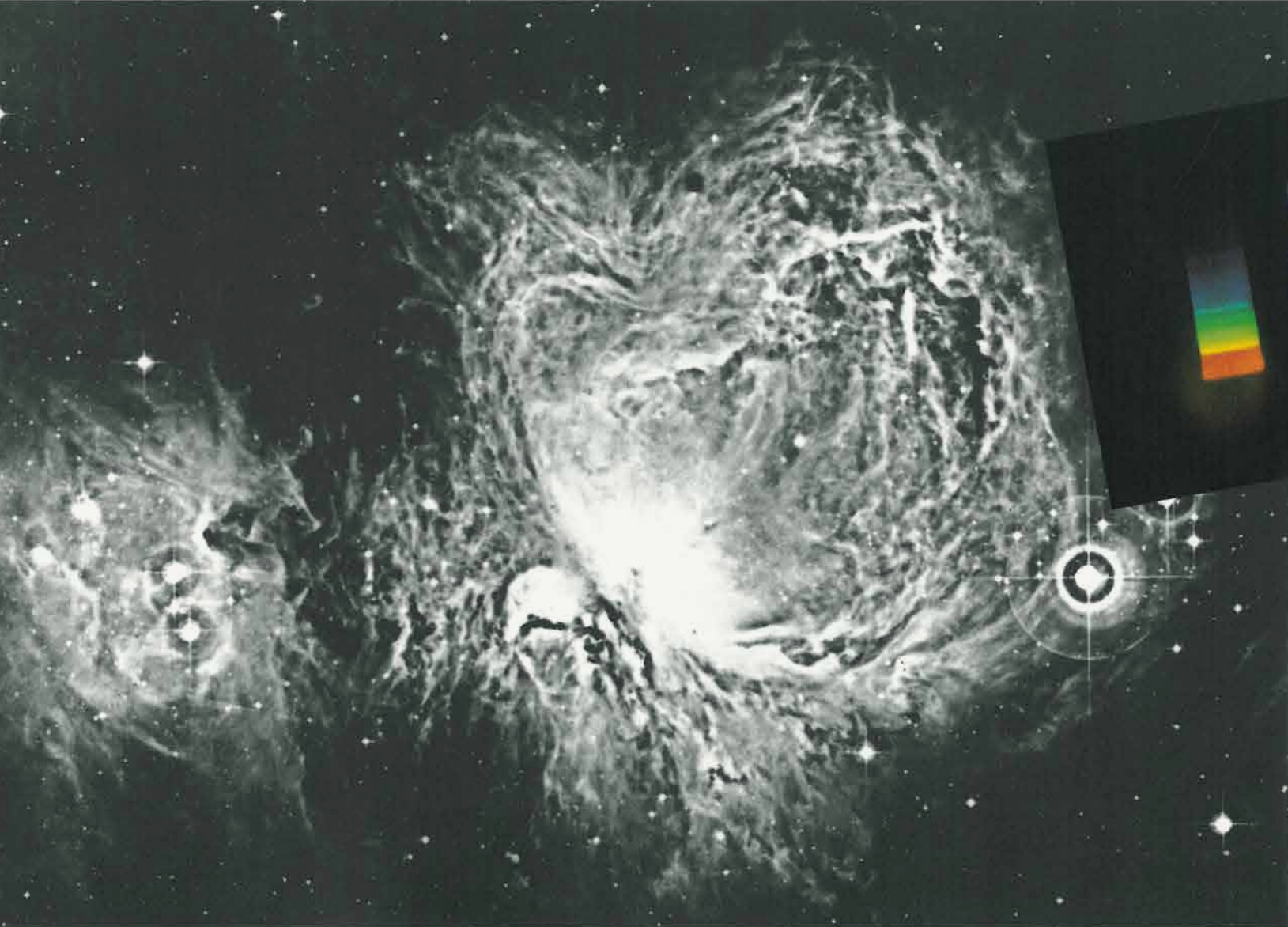


1. Spectrographic image of stars.
2. The Orion Nebula.
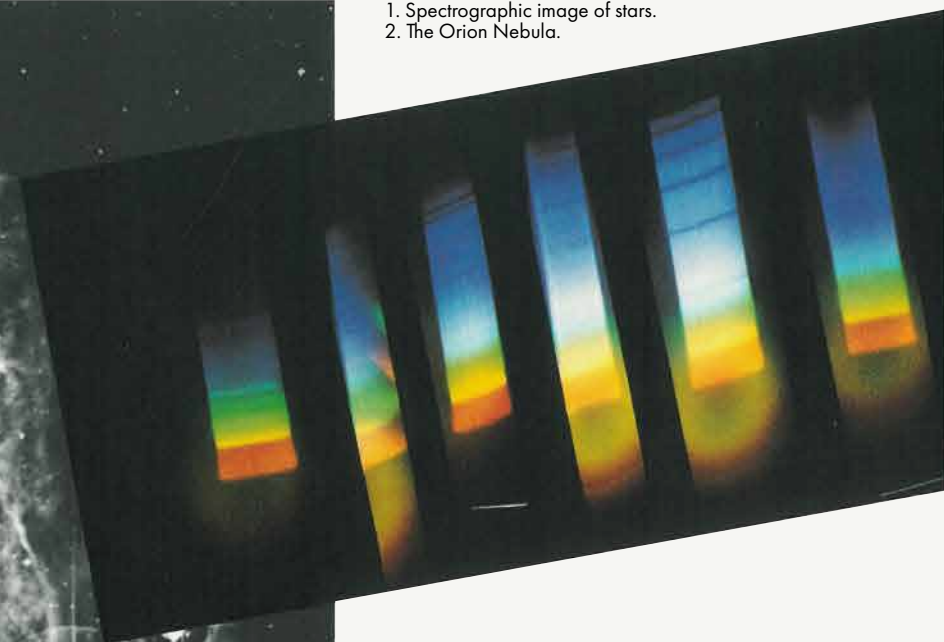
| | |
|---|---|
| raw material [matériau] | |
| matrix [matrice] | |
| **hardware [matériel]** | **stellar crucibles** |
| content [matière] | trace of a trace |
| maternity [maternité] | |

Projection into a three-metre diameter circle of an audiovisual presentation of astrophysics focussing on certain transformations.
The perpendicular screen that surrounds the circle presents formulae and commentaries on these transformations.

# content [*matière*]

We imagine it to be independent of the message that informs us about it: a substance, a reality, an objectivity in itself. You speak of the content [*matière*] of a message, and you think that it remains when you have your back turned.

But this persistence cannot be proved, since the object is only accessible in so far as one receives some message relating to it.

Content: the object about which the message gives information; what the logician and the linguist call the referent of the message. Content as in a 'table of contents'.

A question of testimony which haunts the end of the twentieth century in all domains. Nothing exists, not even the worst of crimes, if there is no trace of it. The content of the object exists only via its traces. These traces must be accessible and available for discussion, like evidence at a trial. It's true of the astrophysicist as much as the perfumer, the historian as much as the photographer: all are judges presiding over an investigation in which the criminals have tried to cover over the tracks of their crime. Because one can always simulate.

Whence a sort of schizophrenia in our manners of representing, and the hegemony of media: 'coverage' of the event is conflated with the event itself. A feeling that there is no external reality, no Other, but only representations. Messages endlessly referring to other messages. Simulacra, and never the thing itself. Between it and us, the veil of analogy. Or rather: the filter of digitisation.

J-F L

# shadow of a shadow

What is real is what is the object of a testimony (here, the photograph) or a definition (here, a dictionary entry). Reality becomes the shadow cast by that which repeats it in images and/or words.

| raw material [matériau] | vain nakedness |
|---|---|
| matrix [matrice] | |
| hardware [matériel] | invisible man |
| **content [matière]** | **shadow of a shadow** |
| maternity [maternité] | |

Joseph Kosuth, *One and Three Shadows*, 1965.
The shadow, its dictionary definition;
the shadow, its image, photographed on
site; the 'real' shadow, the one that was
photographed.

Joseph Kosuth
(Toledo, OH, 1945– )
lives in New York

*One and three shadows*
1965
a shadow, a photograph of it,
and a photographic enlargement
of its definition
overall length: 5 m.
Paris, collection of Galerie Eric Fabre

An example of the definitions made by
the artist in the sixties. The definition, taken
from the dictionary, is placed alongside its
image and the real object. The object of art
becomes quite *explicitly* language and its
different modes of perception.

# trace of a trace

In testifying to reality, the photograph also attests to its absence in the present. So what if the reality photographed is in turn the trace of a lost presence? It would itself be a kind of photograph.



77:072:072, anonymous



77:072:001, anonymous

| raw material [matériau] | all kinds of copies |
|---|---|
| matrix [matrice] | |
| hardware [matériel] | |
| **content [matière]** | **trace of a trace** |
| maternity [maternité] | |

Twenty-three photographs by anonymous photographers, selected by Mike Mandel and Larry Sultan.

**Photos recto**
From the exhibition
'Evidence', 1977,
Tucson, Arizona.
Selected by Mike Mandel
and Larry Sultan.
Center for Creative
Photography,
University of Arizona.

# reciprocal space

To explain the properties of a content [*matière*], one must transcribe them into a different space, deduced via a mathematical relation: a sort of material anamorphosis, this is reciprocal space.
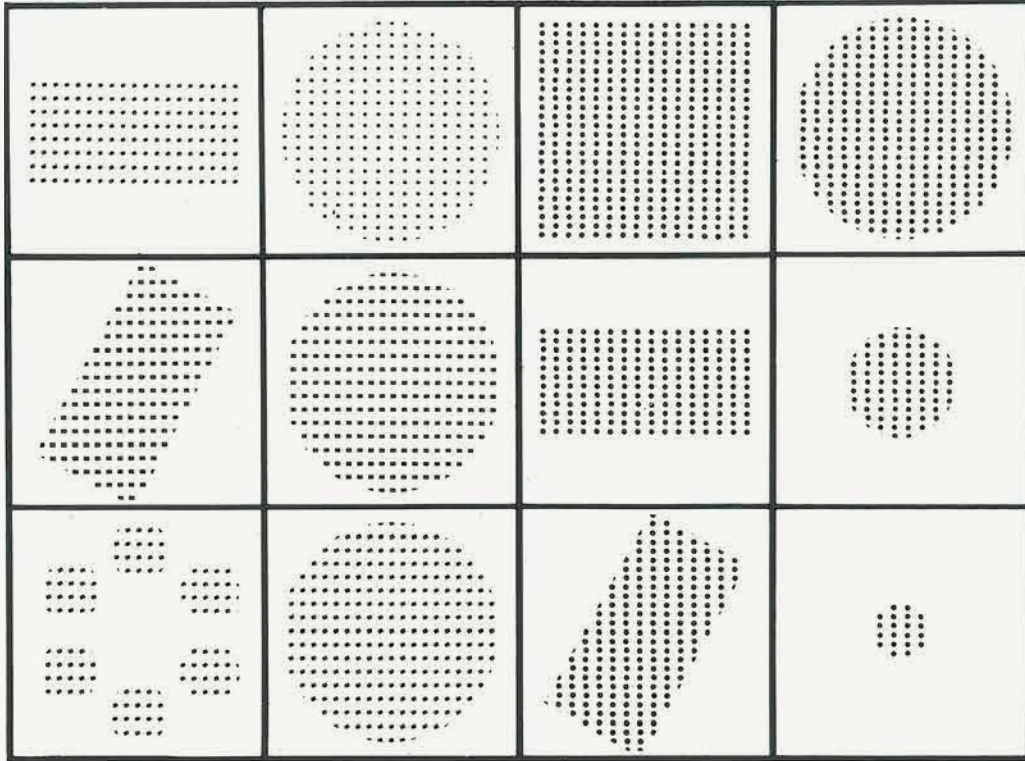


Impact of a laser beam on some matter producing a diffracted figure.
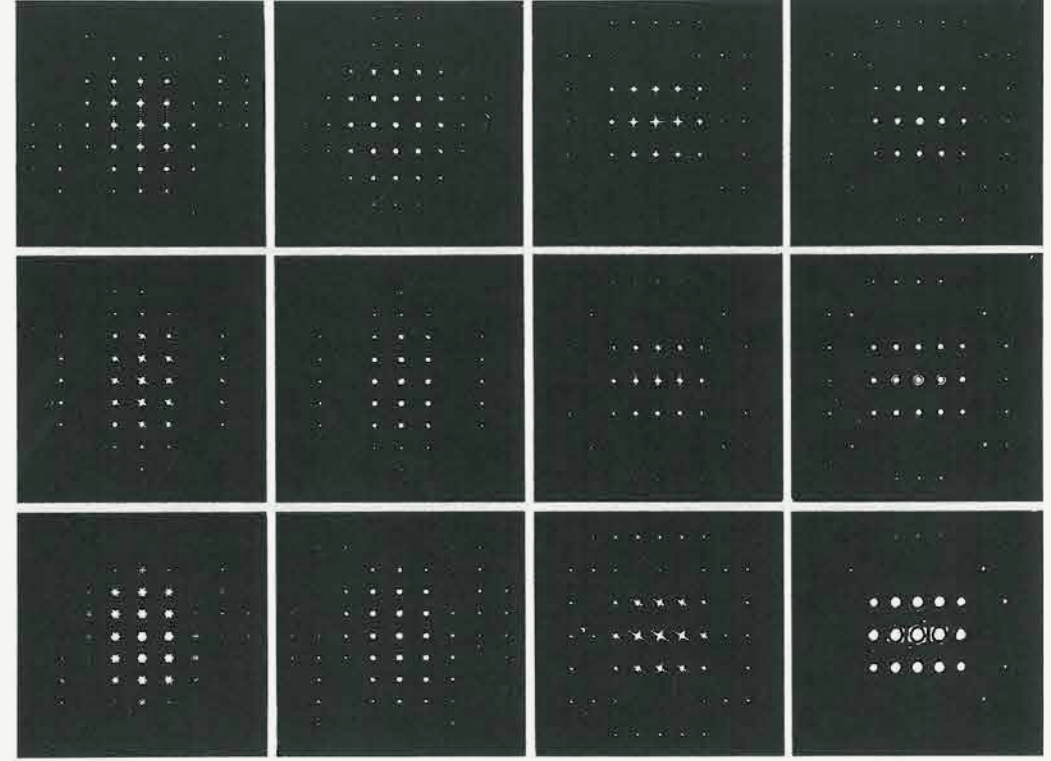
Presentation of Stephen Benton's hologram *Crystal Beginning* (1977), and implementation of a physics experiment: a laser beam goes through some matter [*matière*] and projects an image whose contours form the Fourier 'transform': the reciprocal space of real material [*matériel*] space. On the screen, explanation of the Fourier 'transform'.

| | |
|---|---:|
| raw material [matériau] | exploded body |
| matrix [matrice] | little invisibles |
| hardware [matériel] | |
| **content [matière]** | **reciprocal space** |
| maternity [maternité] | |

Stephen Benton, *Crystal Beginning*, 1977
30.6 × 30.6 cm
London, collection of Eve Ritscher

# stolen light

The painter's problem: how to illuminate the subject (the 'content [*matière*]' to which the painting refers) when the only means available are those of chemical colour? Solution: make light at once the subject (the content [*matière*]) of the painting and the means of painting it. Works about light, made of light. Their content [*matière*] is their raw material [*matériau*]: the vertigo of self-reference.

4
13
9

| raw material [matériau] | luminescent painting |
|---|---|
| matrix [matrice] | little invisibles |
| hardware [matériel] | |
| **content [matière]** | **stolen light** |
| maternity [maternité] | |

2
8
11

5
6
12

7
3

10

1. Simone Martini, *Annunciation*, 1333 (reproduction). Metaphysics of light.

2. Georges Seurat, *Seated model, from behind*, 1887 (study for *Les Poseuses*). Dissolution of the body into light.

3. Giacomo Balla, *Street Light* (light study), 1910. The Futurists sought to paint 'the modern beauty of artificial light'.

4. Michel Larionov, *Landscape*, 1905. Russian rayonism abolished form in favour of colour.

5. Nathalie Gontcharova, *Rayonist Construction*, c. 1913.

6. Sonia Delaunay, *Study for Electric Prisms*, 1914.

7. Robert Delaunay, *A Window*, 1912–1913.

8. *The Woman and the Tower*, c. 1925. Sonia and Robert Delaunay had no subject other than light and movement through colour.
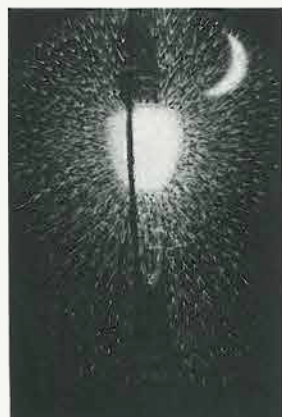
9. Kazimir Malevich, *Suprematist Composition*, c. 1915, 1917, or 1920. A drawing and its reverse. The imprint is the minimum image.

10. Larry Bell, *Untitled*, 1966. A tinted glass cube whose chrome edges catch the light and make it into a building.

11. Dan Graham, *Two Adjacent Pavilions*, 1978.

12. *Cinema*, 1981.

13. *Present Continuous Past(s)*, 1974. The space, light, and time of the gaze.

## 1. Simone Martini
(Siena, 1284–Avignon, 1344)

*Annunciation* (reproduction)
1333
Florence, Uffizi Gallery

## 2. Georges Seurat
(Paris, 1859–Paris, 1891)

Model Seated, From Behind (study for *Poseuses*)
1887
Oil on wood
24.3 × 15.3 cm
Paris, Musée d'Orsay (on loan at the Palais de Tokyo)

In what we must first of all consider as a *modern interpretation* of Ingres's Valpinçon Bathers (Louvre), Seurat sought what André Chastel recognised as the will of the painter to expressly seek 'the value and the universality of his method'.
In this work we find 'the secret of painting as a function of colours and signs conceived as agents at once physiological and psychological, as the unique and mysterious intermediaries between the unknown of nature and the human mind' (*Archives de l'Art François* XII, 1959).

## 3. Giacomo Balla
(Turin, 1871–Rome, 1958)

*Street Light* (light study)
1910
oil on canvas
174.7 × 114.7 cm
signed bottom right: 'year 1909'
New York, Museum of Modern Art,
Hillman Periodicals Fund

'I painted the picture of the *Streetlight* during the divisionist period (1900–1910); in fact, the halo is obtained by means of the juxtaposition of pure colours. It is a painting that is not only original as a work of art, but also scientific, because I sought to represent light by dividing up the colours that compose it [...]. No one thought at the time that an everyday electric street light could be an inspiring motif for a painter. On the contrary, for me it harboured a motif, it was the study of the representation of modern electric light [...] The phrase 'We shall kill the light of the moon' came from my painting.' (Letter to Alfred Barr, 24 April 1954).

## 4. Michel Larianov
(Tiraspol, 1881–Paris, 1964)

*Landscape*
1905
oil on canvas
93 × 102 cm
signed and dated bottom right
M. Larianov/1905
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou
AM 3858 P

## 5. Nathalie Gontcharova
(Moscow, 1883–Paris, 1962)

*Rayonist Construction*
around 1913
charcoal and pastel on grey paper
21.5 × 14 cm
signed bottom right in biro
N (left) G. (right)
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou, gift of Eugène Rubin
AM 1976–890

An ephemeral movement within the Russian avant-gardes just before the Revolution, rayonism, like the Italian futurism from which it broadly took its lead, tasked itself with exalting energy everywhere it could be found. As explained in the 1913 *Manifesto*—recalling the one published by the futurists in 1909—the rayonist style 'is independent of real forms and exists and develops following the laws of painting alone.'

## 6. Sonia Delaunay
(Odessa, 1885–Paris, 1979)

*Study for Electric Prisms*
1914
pastel on silk paper
28.3 × 19 cm
unsigned, undated
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou
AM 2603 D

## 7. Robert Delaunay
(Paris, 1885–Montpellier, 1941)

*A Window*
1912–1913
oil on canvas reverse of the canvas title, signed and dated: 'Une fenêtre' study for the 3 windows—Delaunay 1912, Paris 1913
111 × 90 cm.
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou
AM 2975 P

## 8. *The Woman and the Tower*
around 1925
pencil on paper
29 × 18 cm
unsigned, undated
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou
AM2582 D

Apollinaire wrote: 'The Impressionist movement finally succeeded in painting true simulacra of light' (*Soirées de Paris*, 1912). To which we might add Gilles de la Tourette's words, in 1950: 'Delaunay believed that whereas visually, a simple colour determines its complementary, on the contrary, when it does not determine it, it is broken up in the atmosphere and simultaneously brings forth all the colours of the solar spectrum.' (*Robert Delaunay* [Paris, Librarie centrale des Beaux-Arts, 1950]).

## 9. Kazimir Malevich
(Kiev, 1878–Leningrad, 1935)

*Suprematist Composition*
around 1915, 1917, or 1920
graphite on squared paper
13.7 × 11.4 cm
unsigned
Paris: Musée National d'Art Moderne,
Centre Georges Pompidou
AM 1975–226 D (recto and verso)

On the back of one of Malevich's drawings, the imprint of another, counter-proof of a pencil line. Here the degree zero of painting meets the infra-thin.

## 10. Larry Bell
(Chicago, 1939– ), lives in California

*Untitled*
1966
tinted glass cube with chromium metal frame on a plexiglass pedestal
51.3 × 51.3 × 51.3 cm
total height with pedestal: 1.015 m
unsigned, undated
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou
AM 1981–2531

Larry Bell uses sculpture to analyse the role played by light in the spatial and temporal dynamics of sculpture. He uses glass and its transparency, allowing the light traversing it to become the primordial element of the work. The form is therefore the result of the incidence of light upon the geometrical structure of the work.

## 11. Dan Graham
(Urbana, 1942– )
lives in New York

*Two Adjacent Pavilions*
1978
plastic matter
25 × 70 × 40 cm
Paris, collection of Liliane and Michel Durand-Dessert.

## 12. *Cinéma*
1981
plastic matter
40 × 60 × 60 cm
Paris, collection of Liliane and Michel Durand-Dessert.

## 13. *Present Continuous Past(s)*
1974
video piece made in three parts:
access corridor: 320 × 160 cm
main space: 280 × 320 × 320 cm
two walls are covered with mirrors, on the third a black video monitor and a video camera
technical space: 320 × 80 cm,
containing two video recorders.

Refer to the notice published in the catalogue published for MNAM on American art where Dan Graham himself describes the functioning of this environment: 'The mirrors reflect present time. The video camera tapes what is immediately in front of it and the entire reflection on the opposite mirrored wall. The image seen by the camera (reflecting everything in the room) appears eight seconds later in the video monitor (via a tape delay placed between the video recorder, which is recording, and a second video recorder, which is playing the recording back). If a viewer's body does not directly obscure the lens's view of the facing mirror the camera is taping the reflection of the room and the reflected image of the monitor (which shows the time recorded eight seconds previously reflected from the mirror). A person viewing the monitor sees both the image of himself or herself of eight seconds earlier, and what was reflected on the mirror from the monitor eight seconds prior to that–sixteen seconds in the past (the camera view of eight seconds prior was playing back on the monitor eight seconds earlier, and this was reflected on the mirror along with the then present reflection to the viewer). An infinite regress of time continuums within time continuums (always separated by eight-second intervals) within time continuums is created. The mirror at right angles to the other mirror-wall and to the monitor-wall gives a present-time view of the installation as if observed from an "objective" vantage exterior to the viewer's subjective experience and to the mechanism that produces the piece's perceptual effect. It simply reflects (statically) present time.'

The work will be presented in the permanent collection of the Musée National d'Art Moderne, Paris, from May onwards.

# unrepresentable

Representation of complexity: it is impossible to visually represent the matrix [*matrice*] of an element when it contains four or more variables. A cross-section must therefore be used. Most natural systems depend upon a great many variables. They cannot be represented all in one go. Dematerialisation of the object 'Nature'.

| | |
|---|---|
| raw material [matériau] | luminescent painting |
| matrix [matrice] | little invisibles |
| hardware [matériel] | |
| **content [matière]** | **stolen light** |
| maternity [maternité] | |

Twenty metres square of rainforest with liana vines, ferns, and ivy conceals a phytotron: a transparent cube containing vegetation in a controlled environment. By means of light intensity sensors and hydrometry, two or three of the parameters that make it possible to analyse the growth of plants are measured. On screen, a display of physical data.

Graphic V, 10
Median Annual Growth Rates of Gross Fixed Capital and Production at 28 Branches from 1960 to 1970 (Productivity of Fixed Capital)

Graphic V, 11
Efficiency and Nominal Profitability



Graphique V, 10

Taux de croissance annuels moyens du capital fixe brut et de la production des 28 branches de 1960 à 1970 (Productivité du capital fixe)

Taux annuel moyen de croissance du capital fixe (K) K en %

* Énergie
○ Biens Intermédiaires
□ Biens d'équipement
△ Biens de consommation

Taux moyen annuel de croissance de la production (en %)

* CMS - 03 A (−1, −3)

Source : Les collections de l'INSEE, E 31-32, novembre 1975.

Graphique V, 11

Efficacité et rentabilité nominale

RENTABILITÉ NOMINALE (1959-1968)

Taux moyen de rendement économique du capital fixe productif brut en %

Moyenne de l'industrie (y compris IAA)

▲ Secteur Fresque
● Sous-Secteur industriel

QUADRANT 2                    QUADRANT 1

QUADRANT 3                    QUADRANT 4

EFFICACITÉ (1959-1969)

taux de croissance annuel de la productivité totale du travail et du capital (en %)

Source : Economie et statistique, n° 68, juin 1975.

# calculated images

From *calculation* to the image. Synthetic images make it possible to free oneself of the referent (the content [*matière*] of representation), even if they sometimes still use a realist mode of representation.

| | |
|---|---|
| raw material [matériau] | |
| matrix [matrice] | |
| hardware [matériel] | auto-generation |
| **content [matière]** | **calculated images** |
| maternity [maternité] | all kinds of authors |

On the graphical display of a computer, an interactive presentation in real time of synthetic images: a feather that rises and falls with the visitor's breath.
Video projection of new synthetic images, preview from Siggraph 85.
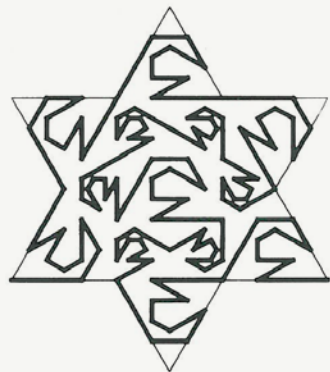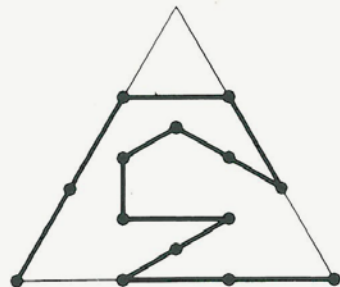
Stages in the development
of a synthetic image
of a snowflake.

Device for interactive 3D images

**Design**
Edmond Couchot

**Software**
Michel Bret

Projection of synthetic 3D images

# painted scent

The artwork represents scent. It becomes scent. The raw material [*matériau*] becomes the content [*matière*] of the work. The work represents itself.



2



1



3
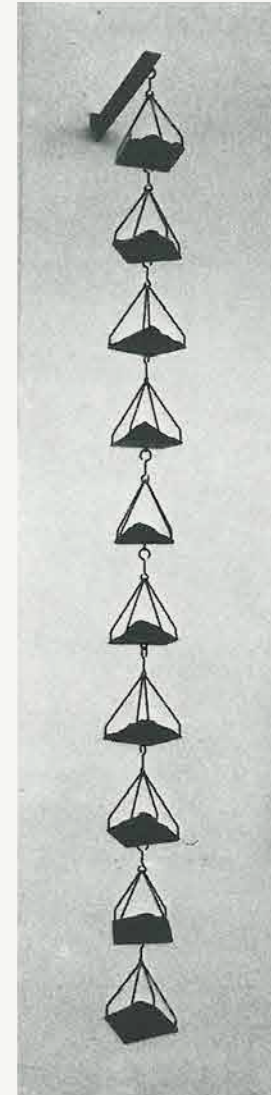
| raw material [matériau] | bodiless painter |
|---|---|
| matrix [matrice] | 'Infra-thin' |
| hardware [matériel] | |
| **content [matière]** | **painted scent** |
| maternity [maternité] | |

1. Jean-Siméon Chardin, *Three Apples, Two Chestnuts, Bowl and Silver Goblet*, also known as *The Silver Goblet*, undated. A work that also represents scents.

2. Marcel Duchamp, *Torture-Morte*, 1959. A foot, some flies, and the whiff of a corny joke.

3. Marcel Duchamp, *Belle haleine, Eau de voilette*, 1921. The veil (*voilette*) and violet (*violette*), *Belle Hélène* and *haleine belle* [good breath] = transformations of the olfactory field.

4. Piero Manzoni, *Merda d'artista*, 1961. In a tin can. An echo of the *Paris Air* bottled by Duchamp, scentless and tasteless.

5. Jannis Kounellis, *Senza titolo*, 1969. On a series of scales, the scent of coffee, the object-subject of the work.



5



4

1. Jean Siméon Chardin
(Paris, 1699–Paris 1779)

*Three Apples, Two Chestnuts, Bowl
and Silver Goblet*, also known
as *The Silver Goblet*
undated
canvas
33 × 41 cm
signed bottom left: Chardin
Paris, Musée du Louvre
(M.I. 1042) La Caze legacy, 1869

Historians agree in dating this work to the
end of the 1750s or even later. (See the notice
in *Chardin*, exhibition catalogue, Grand
Palais, 1979, 351–354). Let us also cite here
the text probably by the painter Antoine
Renou (1731–1806): 'His paintings are sturdy
and vigorous, all the objects fit together and
the result is a transparency of colour that
enlivens everything his brush touches.'

2. Marcel Duchamp
(Blainville, 1887–Neuilly 1968)

*Torture-Morte*
1959 (Cadaquès)
painted plaster and flies, on paper mounted
on wood
0.29 × 0.13 × 0.05 m
Inscribed bottom left in white letters:
Torture-Morte/Marcel Duchamp 59
Cat: L. 224, S. 354
Paris, personal collection

Although the object, made by Marcel
Duchamp in 1959, is first and foremost
a play on words referring to the notion of
the *Nature Morte* [Still Life], it also combines
the reality of the flies glued to the painted
plaster support, and could appear as a
somewhat 'ticklish' metaphorical digression
on the apology of Zeuxis.

3. *Belle Haleine, Eau de Voilette*
(reproduction)
1921
assisted ready-made: bottle of perfume
with label in an oval box.
0.163 × 0.112 m.
inscription (after 1945) on a golden label
attached to the bottom of the box:
Rrose/Sélavy/1921
Switzerland, personal collection

Duchamp as an elegant lady,
on a bottle of Rigaud perfume.

4. Piero Manzoni
(Soncino, 1933–Milan 1963)

*Merda d'artista*
1961
Tin can with label describing the contents,
weight, and precise date of production.
Diameter 0.10 m
Cholet, collection of Danièle
and François Morellet
Paris, Galerie Liliane and
Michel Durand-Dessert

First shown in a personal exhibition in
Copenhagen, at the Kopcke gallery, at
the same time as the *Opere viventi* and
*Placentarium*, Piero Manzoni's *Artist's Shit*,
after the *Achromes* and *Identity Cards*, serves
as a rediscovery of the definition of the
artwork, designated by Artaud and Bataille
as the 'supreme waste product'.

5. Jannis Kounellis (La Pirée, 1936–)
lives in Rome

*Senza Titolo*
1969
Suspended metal plates, coffee
each plate 0.12 × 0.12 m, overall 2.28 m
Rome, collection of the artist, courtesy
Galerie Liliane et Michel Durand-Dessert
Another version of this piece is in the
collection of Kaiser Wilhelm Museum
in Krefeld.

Shown for the first time in December 1969
at the gallery of Lucio Amelio in Naples, this
piece constitutes one of the most emblematic
figures of Kounellis's art. Part of a set, as
well as a reflection on sculpture and weight,
via the presence of the coffee it is also the
expression of an olfactory approach based
on the bringing to light of the specific structure
of the materials used.

# simulated aroma

The question of olfactory simulacra. How can we identify what our nose is smelling when chemistry can produce almost perfect (or more than perfect) equivalents of 'natural' emanations? Destabilisation of reference points in the world of scents.



| | |
|---|---|
| raw material [matériau] | second skin |
| matrix [matrice] | |
| hardware [matériel] | |
| **content [matière]** | **simulated aroma** |
| maternity [maternité] | |

Devices (rigid pipe, fume hood, air blower) create currents of air perfumed with the aromas of different fruits, which the visitor has to identify. In the background, a projection of a synthetic image of a bowl of fruit.

3-dimensional synthetic images.

Document recto
Still from the film
*Gastronomica*, Illegal
Command, ATI-Université
de Paris VIII, Centre
mondial de l'informatique

*Gastronomica*

## Director
Illegal Command

## Co-production
Centre mondial de l'informatique
et ressources humaines
Arts et Technologies de l'image—
Université de Paris VIII
Illegal Command

## Software
PATCH (Michel Bret)
RODIN (Monique Nahas, Hervé Huitric)

## Music
Yves Siederichs (GRM)

# simulated visits

The camera-eye exceeds the paths available to the eye through real movement, extending and complexifying them. It allows us to see 'as if we were there' what cannot actually be seen. That which was 'over there' can become as present to us as that which is here and now.



| | |
|---|---|
| raw material [matériau] | elusive surface |
| matrix [matrice] | |
| hardware [matériel] | |
| **content [matière]** | **simulated visits** |
| maternity [maternité] | |

Maquette of an RATP bus. Three of its windows are replaced by monitors linked to a videodisc. By pressing the 'halt' button, the visitor can 'get off' the bus and go to 'explore' the site of their choice.

Montage of photos from the videodisc 'Le bus'.

'The Bus' or 'An Exercise in Discovery'

### Scenario, Direction
Jean-Louis Boissier

### Editing
Thierry Chaput

### Coordination
Martine Castro

### Head of Production
Annyck Graton

### Technical Advisor (Video)
Cédric Bossard

### Cameraman
Jacques Nibert

### Sound, Mixing
Nicolas Joly

### Photographic Shooting
Hervé Abbadie, Jean-Louis Boissier, Bruno
Brusa, Pascaline Ceccaldi, Shuen-Git
Chow, Patrick Delamotte, Gilbert Delanoue,
Catherine Flochlay, Frédérique Jouval,
Isabelle Lebois, Janine Le Collinet, Maria-
José Ramos, Joël Requile, Françoise Saur

### Co-Production
Centre Georges Pompidou, Centre
de Création Industrielle and Université
de Paris VIII, Arts et Technologies de l'Image

### Photography Laboratory
Centre Georges Pompidou

### Video Production
Centre Georges Pompidou

### Jib Operator
Jean-René Keruzore

### Dolly
Guy Fortier

### Subtitles
Studio de la Comète

### Telecinema and Video Calibration
VCI

### Videodisc
Philips

### Interactive Application
Jean-Louis Boissier and IMEDIA

### Software
Patrick Merissert-Cofinières

### With the support of
RATP

# simulated depth

A radical break with the model of the camera obscura. The hologram is a 'light sculpture'. The interferential inscription on a photosensitive support, modulating the reference light beam, reinstates the reflected and diffused light of the initial scene. Cineholography is a series of holograms registered and presented at the appropriate rate.

| raw material [matériau] | elusive surface |
| matrix [matrice] | flat architecture |
| hardware [matériel] | |
| **content [matière]** | **simulated depth** |
| maternity [maternité] | |

A series of three pieces by Doug Tyler, *Dream Passage, Study nº. 1 (Equation of Time)*, 1983, designed to recreate a virtual space.

Operational multifunctional prototype, presented here as a cineholographic visu-laser by Claudine Eizykman and Guy Fihman (L.E.A.C, E.F. Productions).
This first integrated device for the replay of 30 and 70 mm holographic film functions in a continuous loop, or alternatively back and forth.

1



1. Doug Tyler, *Stren series untitled nº. 3*, 1981, hologram.
2. Shot from 'Vol circulaire de goëlands en hommage à E.J. Marey avec G. Fihman and C. Eizykman', 1981–1982, cinehologram.

Doug Tyler
*Dream Passage, Study 1 (Equation of Time)*
3 pieces, 81.3 × 122 cm

Operational multifunctional prototype,
integrated, presented as cineholographic
visu-laser

### Design, direction
Guy Fihman, Claudine Eizykman

### Production
Laboratoire d'Expérimentations dans les Arts
Cinégraphiques (LEAC, Université Paris VIII)
E.F. Productions

# inverted reference

It's not the 'concrete' building that serves as a reference for the architectural drawing, but also, or better, the architect's plan, the elevation, the cross section that is to be 'seen' in the construction. The reference to the hardware [*matière*] of architecture is inverted. The building represents its representation on paper.

| raw material [matériau] | |
|---|---|
| matrix [matrice] | |
| hardware [matériel] | |
| **content [matière]** | **inverted reference** |
| maternity [maternité] | currency of time |

Works by Peter Eisenman: *House II*, 1969–1970 (maquette, axonometric views), *House X*, 1975–1978 (drawing), *House EL Even Odd*, 1980 (maquette). Commentary on screen.

Photo of a maquette by Peter Eisenman.
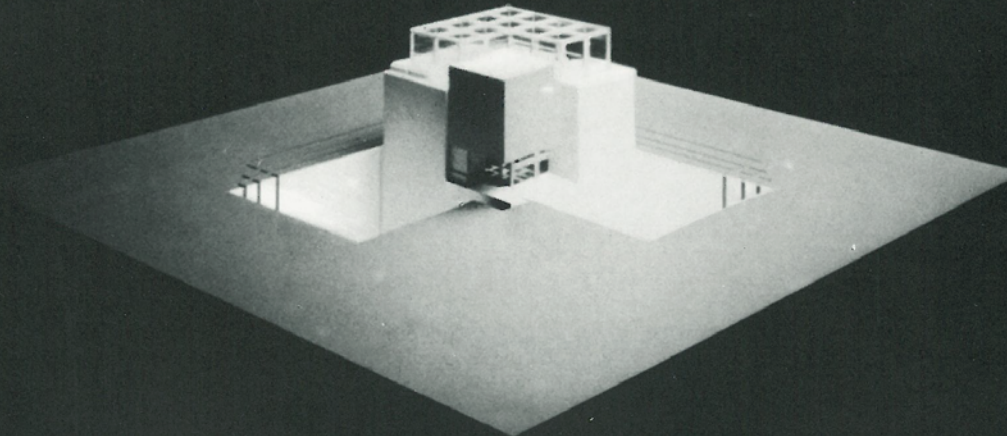
P. Eisenman
(Newark, New Jersey. 1932– )

*House II*, 1969–70, maquette
32.5 × 32.5 × 16.5 cm
Frankfurt, Deutsches Architekturmuseum

*House II*, 1969–70, 24 axonometric
projections
66 × 51 cm
Frankfurt, Deutsches Architekturmuseum

*House EL Even Odd*, 1980, maquettes
177.8 × 101.6 × 30.5 cm
226 × 101.6 × 30.5 cm
114.3 × 114.3 × 50.8 cm
New York, collection of Peter Eisenmann,
architect

*House II*
'House II' was deliberately coded to extract
it from reality. It was constructed to look like
a model. In fact, in many published photos
of the real building the caption says 'Photo
of the maquette of "House II".' The house
looks like a model because all the traditional
means of identification of constructed reality,
flashing lines, ossatures, window supports,
and mouldings, were deliberately absent.
The building was fabricated in steel and
wood and then covered in a silicone-
based material that obliterated all those
identificatory traces.' (1)

'My architecture represents nothing and
is a commentary on nothing, it refers only
to itself, it is the sign of itself, and of its own
appearance... When I turn to the making of
maquettes and drawings taken as objects
in themselves, or when I consider the real
building as a maquette and therefore as a
mere extension and not as a result, I attempt
to reverse the traditional role of architecture
in relation to its own process'. (2)

(1) Extracts from Peter Eisenman,
"Le rappresentazioni del dubbio:
nel segno del segno," in: *Rassegna*,
March 1982.

(2) "A Poetus of the Model—Eisenman's Doubt,"
in: *Idea as Model*, Rezzoli, 1981.

# maternity [*maternité*]

And finally, who speaks? Who do all of these innumerable messages come from?

*Maternity*: the source of the message, that which endows it with its existence and its authority, its author. The sender primes the message with its destination and the receiver with their destiny (which is to receive the message).

While humans believe themselves to be the preeminent receivers of life, the visible, the intelligible, and the law, they imagine themselves to be the sons of god or rather, as in the ancient near-eastern religions, of the goddess. Pre-destined, modern man has tried to occupy the position of the author, to arrogate to himself the prerogative of 'creation'. We then speak of the 'paternity' of a work. Phantasm of a celibate seed. The feminine is distanced from authority, consigned to the side of passion and dependency.

Whether the message is a phrase, a visible image, a building, a child, money, a meal, a piece of clothing—we, the postmoderns, no longer attribute to it any origin or first cause. We do not believe that it is predestined for us by a mother, and we do not assume paternity of it. The freedom of orphans.

J-F L

# speed dressing

The tendency toward a de-differentiation of gender, age, and socio-professional category in today's clothing. The quest for the faster adjustment of clothing taken from a preestablished range, which above all gives out the message that one is 'on trend'. Clothes always maketh the man, but it is no longer mama who makes the clothes, it's the prêt-à-porter market.



Saul Steinberg,
*Masques*, c. 1958.

| | |
|---|---|
| raw material [matériau] | second skin |
| matrix [matrice] | all kinds of skins |
| hardware [matériel] | habitacle |
| content [matière] | |
| **maternity [maternité]** | **speed dressing** |

Cabin with optical device allowing the visitor to try on garments 'virtually'.

'The Magic Mirror'

Device
Jean-Claude Bourdier

# the three mothers

For the forty-six chromosomes of an embryo, multiple possible combinations. Being born today calls into question not only law, morality, and religion but also so-called 'natural' self-evident truths that were supposedly definitive.

| raw material [matériau] | dematerialised material |
|---|---|
| matrix [matrice] | living language |
| hardware [matériel] | |
| content [matière] | |
| **maternity [maternité]** | **the three mothers** |

Projection of diagrams illustrating the different possibilities of conception on an enlargement of a photo by Annegret Soltau, *Auf dem Gebärtisch*. The child from nowhere.
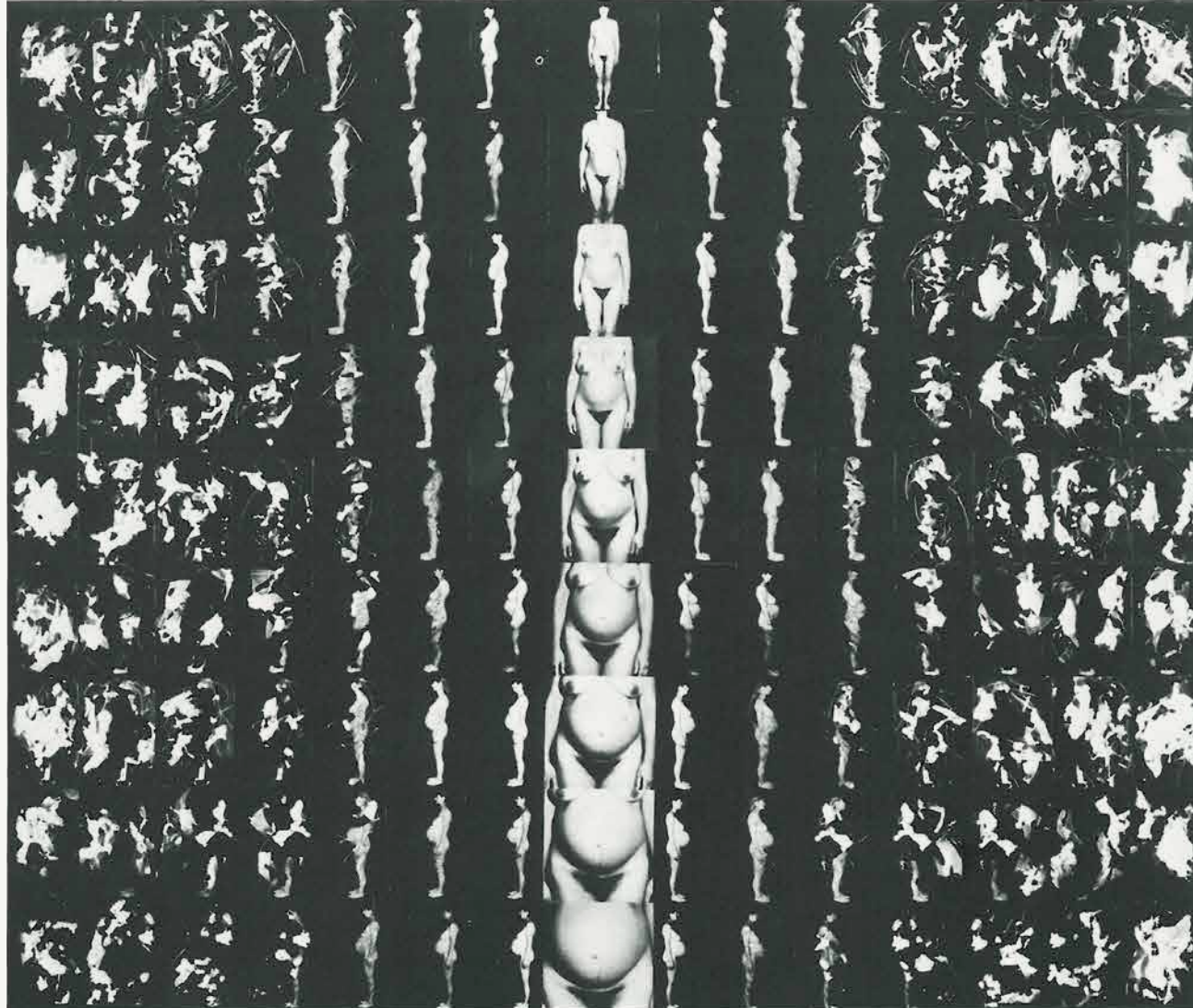


Image: Annegret Soltau,
*Schwanger*, 1980–1982

Photo
Annegret Soltau, *Auf dem Gebärtisch*, 1980.

# precooked-prespoken

In domains ranging from food to language, what is the origin of meaning when it is preprogrammed by a machine? Nutrition in food and replies in conversation both come to you ready-made. Do you still imagine yourself to be the master of meals and words?

| | |
|---|---|
| raw material [matériau] | |
| matrix [matrice] | |
| hardware [matériel] | auto-generation |
| content [matière] | calculated images |
| **maternity [maternité]** | **precooked-prespoken** |

Precooked: on a display stand, different meals, frozen, powdered, and freeze-dried. On the screen, traditional recipes.
Prespoken: screen and keyboard of a microcomputer with which the visitor can enter into a fake dialogue. On the screen, excerpts from *Épreuves d'écriture* (Éditions Centre Georges Pompidou, 1985), an experiment in collective, interactive, remote writing.
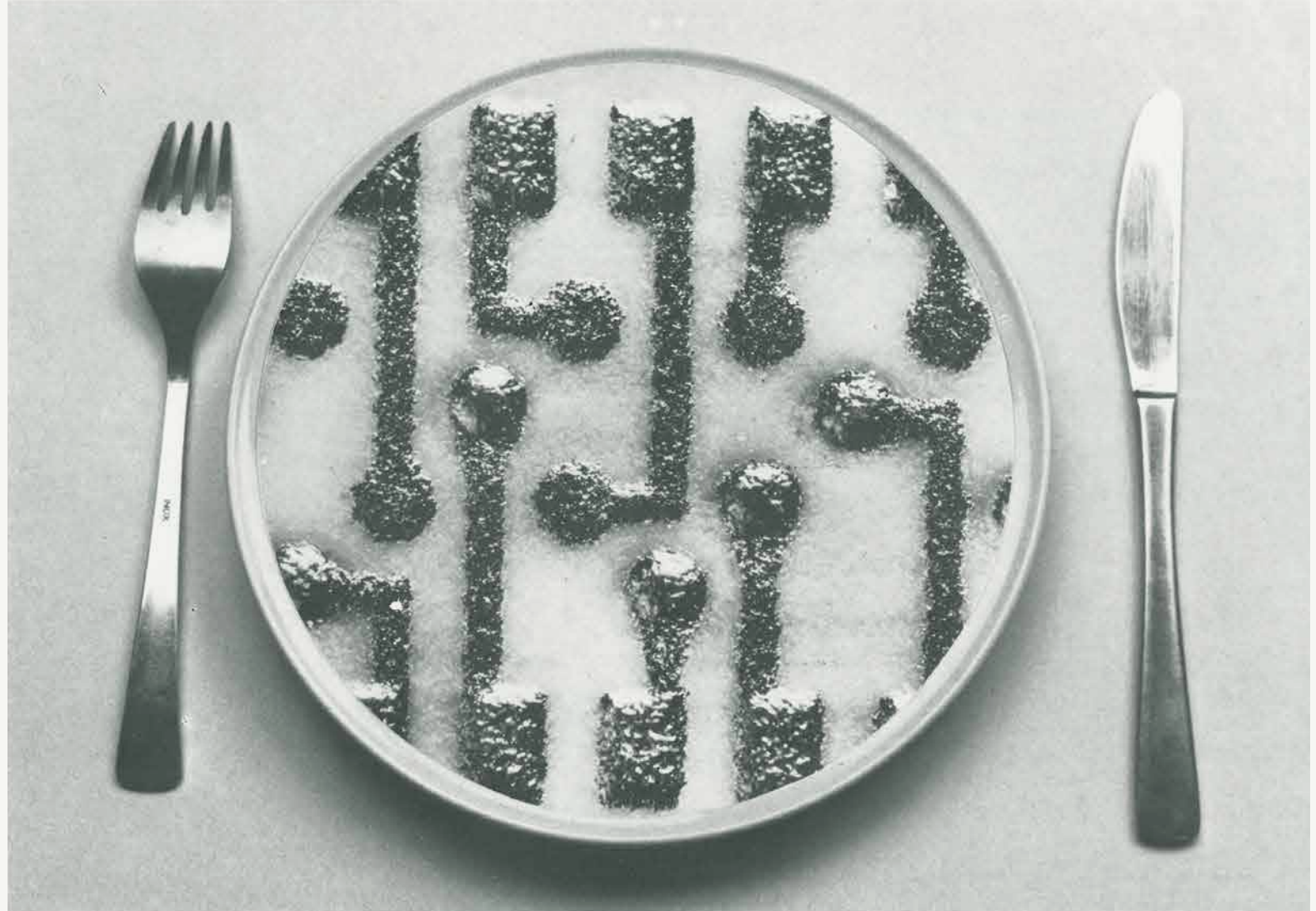


Montage based
on a Bull document.

'Mo' (an automatic responder, Enfants de Dieu)
'Jo science' (a scientific automatic responder)

## Design and Direction
Yves Lecerf
Daniel Lepage
Jacques Larrary
(Laboratoire d'Ethnologie et d'Informatique,
Paris VII)

## With the support of
IBM France
Vidéac

# currency of time

How much is a franc worth? It depends not upon how much precious metal it contains, but what fraction of some other foreign currency it can be exchanged for. And exchange rates fluctuate continually. The purchasing power of money is like potential time: by borrowing, I can get immediately what otherwise I would have to wait for. But this gain in time can also be bought (interest). And it can be speculated on (options). The true maternity of value: time.



Stock market environment
in Frankfurt.

| | |
|---|---|
| raw material [matériau] | 'Infra-Thin' |
| matrix [matrice] | |
| hardware [matériel] | |
| content [matière] | |
| **maternity [maternité]** | **currency of time** |

Direct transmission onto screens of options markets and economic data from different places in the world: speed and coding of information. As a counterpoint, vestiges of the past: a pile of fake gold bars and a paper stock exchange security, from before they were dematerialised. In the background, a projection of clocks marking out time.

# painted trade

Paintings have represented trade in all its glory and all its shame. The artist may signify that the work itself is also (perhaps above all?) an item of commercial value, subject to prostitution. Is the market of pleasures the mother of the arts?

| | |
|---|---|
| raw material [matériau] | 'Infra-Thin' |
| matrix [matrice] | |
| hardware [matériel] | |
| content [matière] | painted scent |
| **maternity [maternité]** | **painted trade** |

1. Quentin Metsys, *The Moneylender and his Wife*, 1514 (reproduction). Morality in the relation between man and wife, one counting money, the other reading the bible.

2. Simon Vouet, *Young Man With a Fig*, undated. Enigma and meaning.

3. Raoul Hausmann, *Mechanical Head (Spirit of Our Time)*, 1919. The spirit of an era that is still our own.

4. Marcel Duchamp, *Obligation pour la roulette de Monte-Carlo*, 1924. The artwork against cash on delivery.

5. Andy Warhol, *Dollar Sign*, 1981. Art and Money, Money and Art— Art is Money, Money is Art.

6. Philippe Thomas, *Subject to Discretion*, 1985. When 'author' and 'buyer' dispute the merits of the artwork, in the art of the self-portrait.



1



2



3



4



5



6

1. Quentin Metsys
(Leuven, 1465 or 66–Antwerp, 1530)

*The Moneylender and his Wife*
(reproduction)
1514
oil on wood
0.70 × 0.67 m
Paris, Louvre, inv. 1444

2. Simon Vouet
(Paris, 1590–Paris, 1649)

*Young Man With a Fig*
undated
0.775 × 0.625 m
Caen, Musée des Beaux-Arts

3. Raoul Hausmann
(Vienna, 1886–Limoges, 1971)

*Mechanical Head (Spirit of Our Time)*
1919
sculpture-assemblage (wigmaker's wooden
dummy head, leather pouch, ruler, watch
wheel, goblet, etc.)
0.325 × 0.21 × 0.20 m
monogram under the right eye: H.
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou
AM 1974–6

4. Marcel Duchamp
(Blainville, 1887–Neuilly, 1968)

*Monte-Carlo Bonds*
1924
original collage
0.315 × 0.180 m.
Signed bottom left: 'Rrose Sélavy' with other
handwritten indication
Paris, collection of Jean-Jacques Lebel

'The *Bonds* appeared, in the form of
collages, in an edition of thirty, stamped from
1 to 30. On a bond modelled after those of
the period, on a green background, there
appears Duchamp's head covered with
soap suds inside a Monte Carlo roulette
wheel. In the margin are twelve coupons.
The pun "moustiques domestiques demistock"
is printed repeatedly in green italics. Each
of the bonds bears the date November
1, 1924, the signature of "President Rrose
Sélavy" along with that of an administrator:
Marcel Duchamp'. Robert Lebel, *Sur Marcel
Duchamp*, Paris, 1959.

5. Andy Warhol
(Pittsburgh, 1928– )
Lives in New York

*Dollar Sign*
1981
Acrylic on canvas
0.40 × 0.50 m
New York, Leo Castelli, Paris, Daniel Templon

The artwork as currency of exchange.
Money as artwork.

6. Philippe Thomas

*Sujet à discretion*
The Mediterranean sea: general view
(anonymous)
Philippe Thomas: self-portrait (point-of-view)
Lidewij Edelkoort: self-portrait (point-of-view)
Paris, collection of Lidewij Edelkoort

Three identical colour photographs, framed
and glazed (format: 65 × 80 cm):
– One (anonymous) is exhibited for what it
shows: it is a general view of the sea.
– The other (signed 'Philippe Thomas') is
a self-portrait, taking its lead from models
of internal monologue—or 'immediate
discourse'—in literature, and from the
subjective shot in cinema: we are in the very
heart of the subject, even if the latter must be
a point-of-view shot.
– The third (available: for a transaction) is
virtually—according to the same interpretive
logic—the self-portrait of the buyer or
collector who, recognising themselves in it,
simultaneously admits that they may be its
author. Here, the subject is authorised by its
Fiction.
The two first pieces ('multiples'), along with
the third (each time a 'unique piece') make
up a set, actualisable at will, and which has
no other solution to signal its originality than
to foreground the signature of its buyer.

# neglected terrain

A building is no longer shaped by its site and the materials of the terrain where it is built. One no longer builds, one implants. In constructing, one built in accordance with the glory or modesty of the correspondence of a culture with a mother nature. What mother is honoured in large-scale architectural projects?

Frank Lloyd Wright, Brick from home and studio in Oak Park, Chicago.

| raw material [matériau] | dematerialised material |
|---|---|
| matrix [matrice] | flat architecture |
| hardware [matériel] | |
| content [matière] | inverted reference |
| **maternity [maternité]** | **neglected terrain** |

Audiovisual montage on two screens, illustrating the loss of construction materials, the collapse of the built. In display cases: brick, wood, and ceramics from buildings by Frank Lloyd Wright and Alvar Aalto. Raw materials [matériau] made sacred as a museum object.

Frank Lloyd Wright
(Richland Center, Wisconsin 1867–Phoenix, Arizona 1959)

This brick from the home of the architect, built between 1889 and 1895 in Oak Park (Illinois), here 'museumified', recalls that, for a period of around a century, architecture had as its origin not only the 'Idea' but the earth. Frank Lloyd Wright testified to his discovery in a series of articles published in the journal *Architectural Record* from February to December 1928: 'Bring out the nature of the materials, let their nature intimately into your scheme. Strip the wood of varnish and let it alone—stain it.'

Alvar Aalto
(Kuortane, Finland, 1898–Helsinki 1976)

Ceramic tiles, 1956–1960
dark blue, 36 × 8 × 4 cm
black, light grey, 24.5 × 5.5 × 4.3 cm
white, 24.3 × 7 × 2.5 cm

Traditionally, attention to detail pertained to the mastery of building processes which, combined with theoretical knowledge, gives the professional definition of the architect. But with his ceramics, Alvar Aalto illustrates an entirely different theme, that of the quest for the possibilities inscribed within matter. With the aim of self-examination, modernity sought to start again from the material so as to extract its meaning from it.

Composition in wood, 1958
39.3 × 31 × 14.5 cm
Helsinki, collection of Elissa Aalto, architect

Alvar Aalto always opposed the equation *modern architecture=new materials*. The compositions in wood made between 1930 and 1947 announce a working method already espoused by Frank Lloyd Wright: '[...] It is impossible for me to cut motifs into wood as if it were cheese. The internal structure of the fibre always plays its role and must be respected' (architecture, painting, sculpture).

Audiovisual montage *Lost Maternity*

**Design**
Alain Guiheux

**Images**
Sabine Vigoureux

**Direction**
Patrick Arnold

# all kinds of authors

Because of the proliferation of procedures for reproduction and distribution, and the complexity of techniques for production, the identity of the author is increasingly difficult to make out or to define. The paternity of a work, undefinable?

raw material [matériau]

matrix [matrice]

hardware [matériel]

content [matière]

maternity [maternité]

Composition made of entangled luminous coloured circuits containing eleven paths corresponding to eleven questions accessible to the visitor. The colours vary depending on the nature of the rights.

Ruth Francken, triptych *Jean-Paul Sartre*, from the series 'Mirrorical Return', 1979.

Photos recto
Ruth Francken, triptych
*Jean-Paul Sartre*, from
the series 'Mirrorical
Return', 1979
nº. 1: 100 × 65 cm
nº. 2: 200 x 65 cm
nº. 3: 100 x 65 cm
Blue and black pencils,
cut-outs, collages,
photographic fragments,
soft dark blue rhodoid,
on cardboard
Norway, Songa collection
Henie Niels Onstad
Foundation, Høvikodden
Photo: R. Obligi F. Rolland

Installation
Alain Leboucher

# labyrinth of language

'This philosopher observed that all books, however different from one another they might be, consist of identical elements: the space, the period, the comma, and the twenty-two letters of the alphabet. He also posited a fact which all travelers have since confirmed: *In all the Library, there are no two identical books.* From those incontrovertible premises, the librarian deduced that the Library is "total"—perfect, complete, and whole—and that its bookshelves contain all possible combinations of the twenty-two orthographic symbols (a number which, though unimaginably vast, is not infinite)—that is, all that can be expressed, in every language. All: the detailed history of the future, the autobiographies of the archangels, the faithful catalog of the Library, thousands and thousands of false catalogs, the proof of the falsity of those false catalogs, a proof of the falsity of the true catalog, the gnostic gospel of Basilides, the commentary upon that gospel, the commentary on the commentary on that gospel, the true story of your death, the translation of every book into every language, the interpolations of every book into all books [...].'

Borges, 'The Library of Babel'

# artificial memories

You don't have a memory? Hire one, or many. So begins the great process of externalisation (banking) of memories, here artistic ones. Once, memory inhabited us; now we access it, we consult it. 'Artist-pages' can even be obtained on demand: an imaginary museum. The beginning of a solution to the infernal question of storage. But what machine will take care of sensibility?



Image: Ruins of the Holland House Library in Kensington, London, 1940.

## access

For the first time in France, the *Accès* project asks artists to produce an original work to mark the contemporary adventure that is telematics. On 1 December 1984, screen pages were made by: Ben, Benni Efrat, Jean-François Bary, Frédéric Develay, Ange Leccia, Jean-Claude Lefèvre, Frédéric Martin, Édouard Nono, Orlan, Aldo Spinelli, Gianni Toti, Bernard Venet. Three or four new creations will be added to this evolving collection each month, and will be available on the Télétel network from March 1985.

## book screen

A proposal to use media interactivity to produce interviews/dialogues with writers: dialogues centering on a new theme each month. First theme: the relation of these 'people of the sign' to new technologies and new means of communication.

Télémaque sets themed questions but, above all, anyone can pose their own questions to the writers invited each month. From their own home, at any time, the writers may or may not respond, visualising what is asked of them.

## iconography

The videodisc *Iconographie* is an example of a documentary image bank. It contains a selection of images from the archives of the *Bibliothèque publique d'information*: three thousand slides covering art, history, science, technology, and tourism. The application presented in the exhibition allows the user to select images via successive 'menus'.

## access

### Design and direction
Frédéric Develay, Frédéric Martin, Orlan
WIth the collaboration of Editions Télémaque

## book screen

### Design and direction
Editions Télémaque

## iconography

### Design
Bibliothèque publique d'information (BPI)
VT COM

### Direction
VT COM

### Production
Direction Générale des Télécommunications
(DGT-DAV)

### With the support of
Direction Générale des Télécommunications
(DGT-DAT and DGT-DAV)
Leroy Electronique
VT COM

# artificial logics

To find the guiding principle behind a series of elements, to reconstruct the reasoning that led to a numerical product, to evaluate a situation in terms of risk and its avoidance—this is what we call judgement: to discover the law that governs specific cases, or to invent a case that satisfies the law. If machines are our little sisters in judgment, then it is because we ourselves are also software. Startled by this family relationship, discomfited?





Graphological expertise.
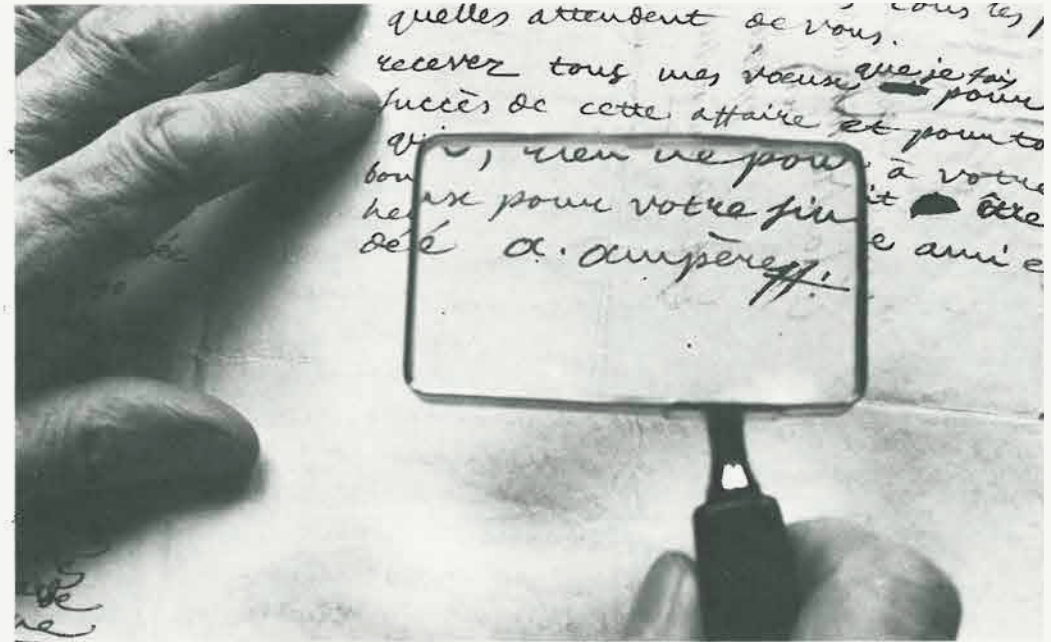
## logical number series

On the principle of the logical numbers series used in IQ tests, the user can submit arithmetic, geometric series of numbers, alternating or not, etc. to the 'wisdom' of the machine. It completes the series given with the two following numbers, and displays the logic that led it to this deduction.

## number game

On the terminal of a microcomputer, the user is invited to enter a list of six numbers between 1 and 100. A 'goal number' can also be given; the program allows the machine to display the reasoning that leads it to find the 'right number'. Only exact solutions are allowed, approximations cannot be accepted.

## M.1

Knowledge engineering tool. Allows one to test and familiarise oneself with the methods for using software packages in the domain of diagnostics of all types which formerly required human intervention, or human intelligence. The M.1 system uses a database to resolve a problem posed to it, it can give advice or conclusions, and, following a consultation, can explain the principles of its reasoning and justify its conclusions.

## M.1

**Design**
Framentec

**With the support of**
IBM France
Vidéac

## logical number series

**Design**
Emmanuel Darmois

**With the support of**
IBM France
Vidéac

## number game

**Design**
Catherine Recanati

**With the support of**
Informatique France

# words on stage

Text represents. On signs, posters, billboards, flyers, the covers of magazines, packaging. Writing acts not only through meaning, but also through its sensible form. The eye is drawn into the spatial texture, and the mind enters onto the stage.



1

2
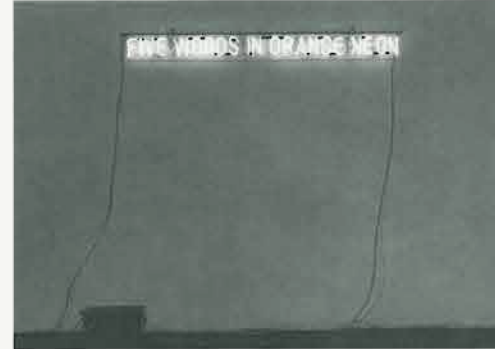
3

1. Joseph Kosuth, *Five Words*, 1965.
2. Ian Wilson, *There is a Discussion*, 1979.
3. Robert Barry, *Of Course*, 1979.

1. Joseph Kosuth
(Toledo, OH, 1945– )
Lives in New York

*Five Words in Orange Neon*
1965
neon and electrical device
length 150 cm
Paris, collection of Liliane and Michel
Durand-Dessert

This series contains similar works of different
colours. This one constitutes a perfect
example of the use of neon by the artist,
and combines a tautological character
with a reflection on colour and space.

2. Robert Barry
(Bronx, 1936– )
Lives in New York

*Of Course*
1979
pen and black ink on Canson cream paper
29 × 22.9 cm
written from top to bottom and from
left to right:
apparent/too much/deadly/changed:
of course/disagree/nothing else/I will
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou
AM 1978–795D. recto

Robert Barry's drawing constitutes the basis
of a potential mural, at the limits of the space
allocated to it. The artist's work tends first
and foremost to express a dematerialisation
of the artistic object. The words inscribed
on the borders of the sheet (or on the edge
of space) constitute the designation of a
sensible perception of space.

3. Ian Wilson
(Seymour, 1924– )
Lives in New York

*There Is a Discussion*
1979
Sentence of four typewritten words
on a sheet of paper
29 × 21 cm
signed bottom right: Ian Wilson
Paris, Musée National d'Art Moderne,
Centre Georges Pompidou
AM 1978–802 D

Discussion with the audience constitutes
the basis of Wilson's artistic investigations.
Although the initial question bears upon
the notion of art, the simple sheet of paper
containing the phrase 'there is a discussion'
corresponds to the *inscription* of a factual
moment that has taken place. In this sense, it
may be seen as a written form of evocation.

# sequences to be modulated

The machine places at your disposal rules of syntax, which it controls, and combinable elements that you can use to make your own story or video clip. A tradition of combinatorial literatures, a quest for the apparition of sense. Obviously, one writes with language (with everything that has already been said), but also against it, to make it say what it has not said before.

## modular stories and songs

Modular writing has existed since the beginnings of writing itself: the alphabet is a marvellous permutational system based on a bank of twenty-six signs. Well before the computer arrived in our civilisation, card games, and in particular divination using the Tarot, provided perfect media for interactive games. Playing cards, Tarot cards, or, here, sound and video modules, although revealed on screen according to a random selection, are never manipulated gratuitously, and their assemblage is always a bearer of signification. With new technologies of communication, in a certain sense, the question of the Beautiful is displaced in favour of the question of Exchange.

Through this audiovideotext application, the interactor may confront two types of imaginary:
• In *Contes d'électron* [*Electron Stories*], they enter into a world of the poetic, symbolic, and analogical where, as if in a tarot reading, meaning is at once relative and ever-evolving. The structure of the texts is based on a simple traditional morphology of the story which somewhat recalls the progress of the great alchemical Work;
• with *Chansons Modulaires* [*Modular Songs*], the interactor is overwhelmed by a litany, by turns acidic, tender, violent, sensual, and hopeless, in which flashes of words clash with the flashes of graffiti that crawl all over the screen.
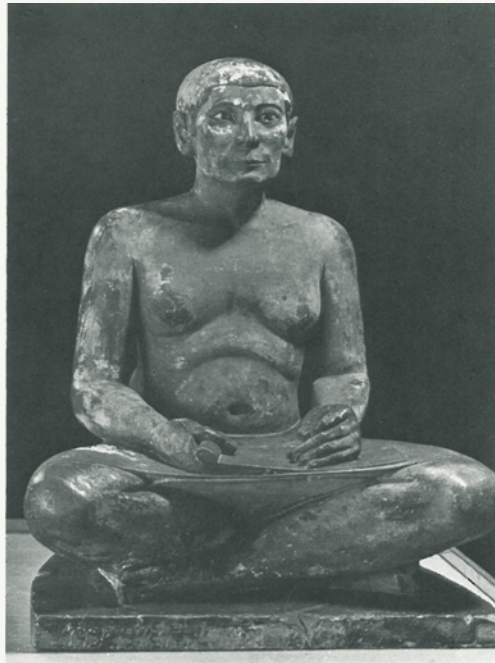




1. Crouching Scribe, Egypt, 5th dynasty.
2. Jacob and his dream of a ladder leading to the sky, Rome, Via Latina.

## ladders

Interactive device that generates stories on the basis of pre-texts adapted from the work of various authors.
The user:
• composes their own story on the basis of pages placed at their disposal so they can mix together how ever many they want;
• chooses the names of the characters;
• produces a generated text in real time;

while they certainly will not be able to read all the different possible versions, they will be made aware of them by seeing a few;
• makes a choice at certain moments in the writing of the story.
They are also able to:
• write a few lines to subsequently discover what will happen to their contribution;
• after reading, to see a version of exactly the same text with the roles reversed;
• to read the original versions.

The system of rewriting does not use any preestablished syntactical or narrative structure. The forming of phrases and stories depends only on the way the pre-texts are cut up and arranged. The succession of random choices is made on six levels of various lists before arriving at the final stage, that of syntagms. Apart from the transitions, each version generated uses only elements of the originals, without missing any one out, or using any one more than once.

# ladders

### Design
Michel Bezard
With the collaboration of the Centre mondial de l'informatique et ressources humaines (laboratoires didacticiels)

### With the support of
Bibliothèque publique d'information (BPI)
IBM France
Vidéac

# modular stories and songs

### Design and Direction
Marc Denjean

### Texts, images, and scenarios
Marc Denjean

### Software
Françoise Coliaïtis
Christian Lecocq

### Modular Music
Arnaud Chambaz
Bernard Sachsé

### Recording and Mixing
Arnaud Chambaz

### Actor
Emilie Benoit

### Scribe
Marc Denjean
Michel Jullien, ENSCI

### Co-production
CCETT, Rennes
OCTET
Thomson-TITN

### With the support of
ENSCI
Galerie Alain Oudin

# novels to be made

Live out the fantasy of writing a novel, at high speed. From snippets and clues, reconstruct 'your' story, and learn from what kind of imaginary 'reality' you desire.

## the lost object

Telematic fiction: an interpretation of the myth of Osiris. The structure of informatics is a body analogous to that of Osiris. The spectator, in his work of reconstruction, takes on the role of Isis, who reassembles and reunifies. This imaginary body is organised into 'anatomical' sets, suggested by the titles of the main screens. The story, although subject to the caprices of the reader, contains all the elements that preside over the crafting of a novel: action, events, cliffhangers, characters, broader themes, etc. The work is made up of three stages:
 • the first stage serves to make known to the spectator one of the numerous possible paths the story could take;
 • the second informs them of the partial 'destruction' of what they just read;
 • the third asks them to rewrite a story on the basis of the 'remains' of their consultation. Each spectator finds their own path through the story.
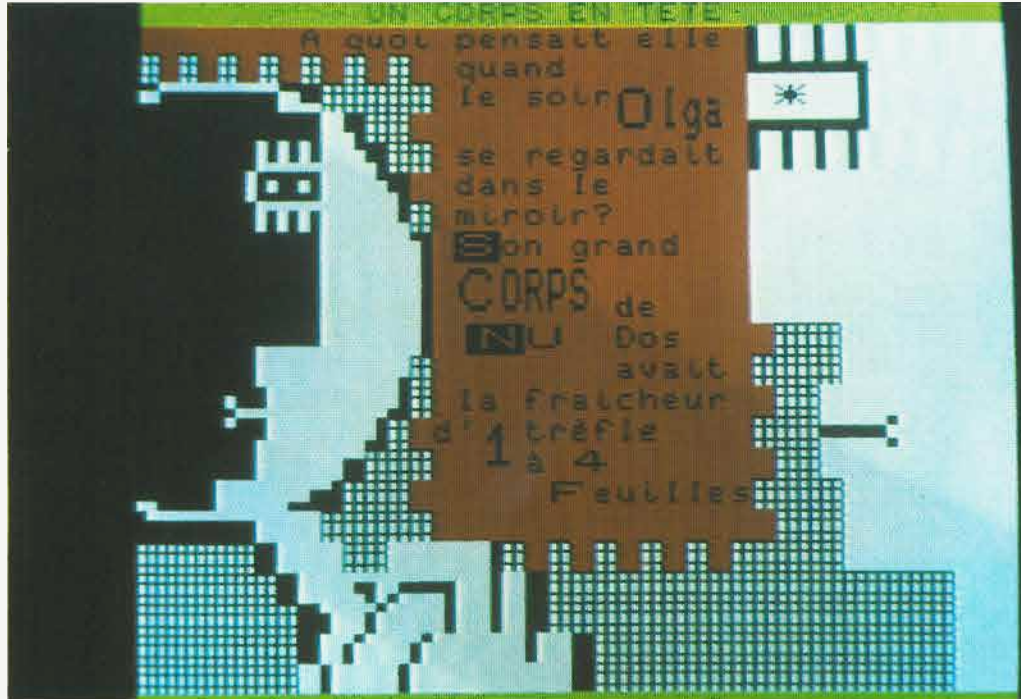


1. Videotex screen-page of the novel *The Lost Object*.
2. Montage based on a poster by S. and J. Jupin.

## oronge juice

Telematic detective fiction. At once a classic mystery crime novel and a 'software-novel' allowing multiple readings, depending on the reader-investigator, who can follow up various leads as they choose until they reach a choice of two different solutions. The novel is made up of 476 screens of at least fifteen lines: each screen contains one or two clues (sometimes misleading). The 'reader' takes on the role of detective, and must make choices about:



 • the discovery and verification of clues;
 • the order in which witnesses are interrogated;
 • the consultation of documents or commentaries on them;
 • the solutions to the mystery;
 • the resolution of 'reader challenges'.

## oronge juice

### Design
Francis Debyser

### Production, publishing
SERPEA

## the lost object

### Design and Direction
Jacques-Elie Chabert
Jean-Paul Martin
Camille Philibert
Dominique Horvilleur

### Coordination
Centre de Création Industrielle (CCI)

### Production
Centre Georges Pompidou, Bibliothèque
publique d'information (BPI)
Groupe de Recherches Audiovisuelles
(GRAV)
Libération

### Distribution
VT COM
Libération

### With the support of
The directorate-general of
Telecommunications (DGT)

### Screenprints
Jacques-Elie Chabert
Camille Philibert

# stylistic machines

Rules in literature are an old idea. They determine the principle of genres. ALAMO develop software that makes it possible to generate brief stories, fables, short Japanese poems, Baudelairean prose, etc. The constraints of writing are embedded in the machine, its freedoms available to the user. The users may even take themselves as an author—on condition that they forget who makes the rules, that is, the software.

Cent huit coups de cloche.
Nouveaux péchés.
Le parfum séducteur des fleurs,
dans la nuit,
déjà m'égare !

Haiku, a Japanese poem
of seventeen syllables.

## evanescent text/dematerialised text

The writing programs presented here may be schematically divided into three levels of informatic work.

The most simple level is the combinatorial. All the phrases of the text are given in advance by authors, and only the arrangements or the explorations of the different paths of the story are determined by the program, either randomly, as in the program *Scénario*, as a function of formal criteria, as in Raymond Queneau's *1000,000,000,000,000 Poems*, or interactively via the choices of the reader, as in *Contes à votre façon* [*Stories to Order*].

A slightly more complex level of program may be described as 'applicational'. The central principle of such programs is that of 'moulds', more or less abstract sentence structures—or story structures—which are filled by words taken from 'dictionaries'. The criteria for the selection of terms and their inclusion in the moulds must obey

constraints of all orders, orthographic as well as syntactic and stylistic. *Aphorisms*, the *Rimbaudelaire*, and the *Mallarm* obey these types of constraints.

Finally, a yet more complex level is the inferential level: on the basis of preexisting structured dictionaries, programs for the automatic generation of syntactical structures, of textual macrostructures, the machine can generate an infinite number of texts of a given stylistic type.

Some examples are shown here, partially in *Alexandrins artificiels* [*Artificial Alexandrines*], in *Nouvelles à votre façon* [*News to Order*], and in full in *Renga*, whose method of display has been devised especially so that readers can perceive the essential steps of the informatic analysis.

# evanescent text/
# dematerialised text

### Design and direction
ALAMO

### Co-production
Bibliothèque publique d'information (BPI)
La Villette—Cité des Sciences et de l'Industrie

### With the support of
BULL
IBM France
Vidéac

| Name of Program | Author of the textual component, or origin of textual elements | Author of Program |
|---|---|---|
| Alexandrins artificiels | Various classical authors | Jacques Roubaud Pierre Lusson Paul Braffort |
| Aphorismes | Various authors Marcel Bénabou | Paul Braffort |
| Contes à votre façon | Jean-Pierre Balpe | Jean-Pierre Balpe |
| Haïku | Jean-Pierre Balpe | Jean-Pierre Balpe |
| Locutions introuvables | Marcel Bénabou | Paul Braffort |
| Mallarm | Mallarmé | Paul Braffort Pierre Lusson Jacques Roubaud |
| Nouvelles à votre façon | Paul Fournel Paul Braffort | Paul Braffort |
| Renga | Jean-Pierre Balpe Jacques Roubaud | Jean-Pierre Balpe |
| Rimbaudelaire | Rimbaud Baudelaire | Paul Braffort Pierre Lusson Jacques Roubaud |
| Scénarios | Simone Balazard | Nicole Modiano |
| Sonnets | Raymond Queneau | Paul Braffort |

# field and moment of the voice

Two ways of inscribing the voice in space. Two spaces: the space of analytic geometry—the spectrograph decomposes the acoustic variables of sound, and poetic space—thanks to the artifices of video art, oral performances of poetry (spoken word) are staged in such a way that the image suggests and extends the powers of the voice, in the memory and in the imagination. Inscription of knowledge, inscription of sentiments.
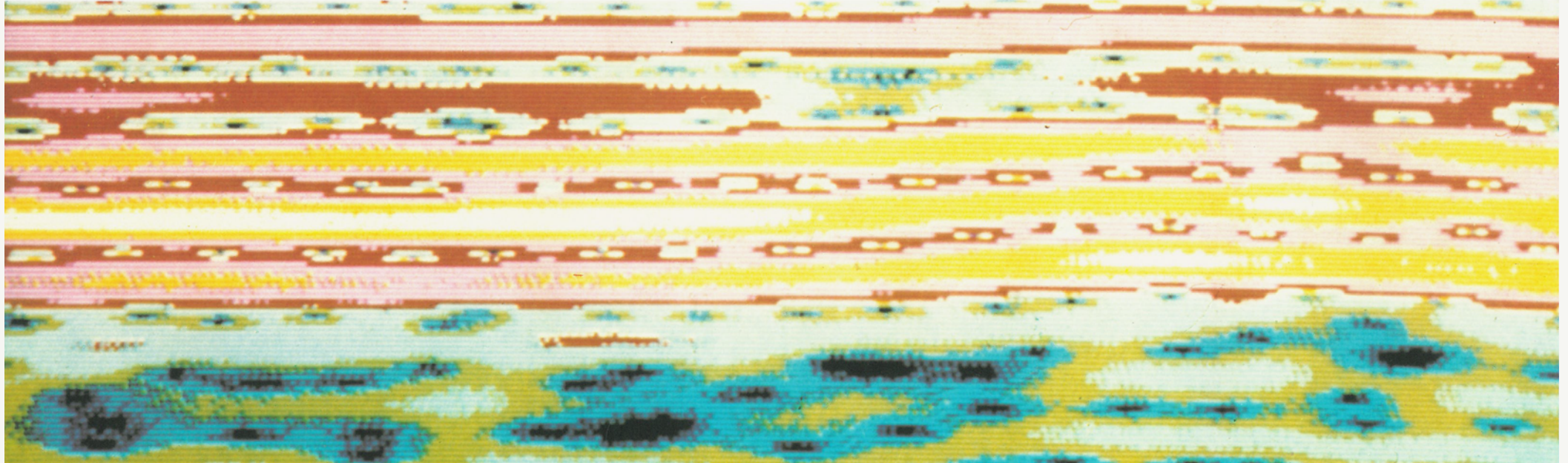


## words are objects

The practice of reading involves the body, space, orality, the voice, and new communications technologies, in a relation to the theatre yet to be defined. Interviews and reports fuel and open up the field of a poetic practice outside the page, in a language and a form that are accessible without betraying the intention, meaning, and specific approaches of this new poetic genre. The specificity of video and the possibilities it offers for creative work are integrated in such a way as to surpass the style of reportage and archiving, but without subscribing to the aesthetic of the short video clip. The following effects are used: inlaying (background/ foreground), raster memory (trace/speed), colourisation (form/light), modulation (image/ sound). Video 3/4 inch Umatic PAL, duration 17 minutes, produced 10.07.1984.

## trace of the voice

On the screen of the spectrograph, time becomes the x axis, and frequency (pitch) the y axis, with intensity represented by colours. So-called 'complex' musical or vocal sounds result from the combination of many simple sounds of different frequencies and intensities. The spectrograph detects a complex sonic event, and decomposes it into simple sounds which it represents on the screen. The general view of the image obtained gives us a glimpse into the form of the sonic event, in particular its attack, which plays an essential role in the perception of sound. Spectrograms of the sound of an oboe, a clarinet, and an isolated vowel.

On-screen visualisation of the spectrogram of the voicing of a vowel.

# trace of the voice

### Design and Direction
La Villette—Cité des Sciences et de l'Industrie

# words are objects

### Design and Direction
Frédéric Develay
Frédéric Martin

### Production
Intérieur/Extérieur

### Original Music
Jean Vinegla
Frédéric Martin

### Filming
Alain Longuet
Loïc Jugue
Philippe Roth

### Post-Production
Michel de La Taulade

### With the participation of
Bernard Noël, Bernard Heidsieck,
Jean-François Bory, Jean-Paul Curtay,
Alain Arias Misson, Frédéric Develay,
John Giorno

# trials of writing

Around thirty 'writers', at their computers, make commentaries on a series of thematic words. They send their texts telematically. After two months, the experiment is interrupted, and the result printed as is. What happens to writing? A confusion of authors and readers, of the private and the public? The hegemony of context and pre-text over the text? A telescoping of the phases of artisanal writing? A trauma for the writer, to be sure.

An experiment in collective, interactive, remote writing conducted by means of microcomputers equipped with word processing and communications software, installed in the homes of twenty-six authors (philosophers, scientists, writers), linked to a central memory bank. Over a period of two months, starting from a list of fifty words, they were able to freely add to their own texts, and those of the other authors, for any reason (to refute, alter, or comment).

Page by page on the M24 (central memory bank), scroll through all of the texts from this experiment in writing. Five minitels symbolically connected to the central unit allow access to the first texts of the twenty-six authors, transcribed into the videotex standard. They can be searched by keyword (fifty in all) or by author.



Drawing by Saul Steinberg.

## Authors
Hubert Astier, Nanni Balestrini, Mario Borillo,
Christine Buci-Glucksmann, Daniel Buren,
Michel Butor, Paul Caro, Michel Cassé,
Daniel Charles, François Châtelet, Philippe
Curval, Jacques Derrida, Marc Guillaume,
Philippe Lacoue-Labarthe, Bruno Latour,
René Major, Jean-Claude Passeron, François
Recanati, Jean-Loup Rivière, Maurice Roche,
Pierre Rosenstiehl, Jacques Roubaud, Dan
Sperber, Isabelle Stengers, Michel Tibon-
Cornillot, Jean-Noël Vuarnet.

## Network architecture
SERPEA

## Software
ZH Computer
Serial Informatique

## With the support of
Direction du Livre et de la Lecture/
Ministry of Culture
Olivetti France (M20 and M24
microcomputers)
Project Assistance (Microbase server)
G. CAM

## Videotex Layout
Jacques-Elie Chabert
Elesig
François Hanss
Caroline Krakowiecki
Jérôme Oudin

If you have a minitel, you can access
the videotex guide to the exhibition via G.
CAM's Pluriel server—615 91 77, access code
OK1 or OK2 or OK3 (menu option, *voir*).
or
614 91 66 access code: CLIPP, service IMMA

# deferred time

Simultaneous existence of different times. Presence of the deferred and absence of the immediate. Time is neither unique nor linear; from every instant there unfold multiple moments at once.

Installation by Catherine Ikam: two corridors twelve metres in length, identical. On the video screen in the first corridor, the visitor sees the space in which they stand; but they themselves are not there. Passing into the second corridor, they now see themselves on the screen, but as they were a moment earlier in the first corridor.
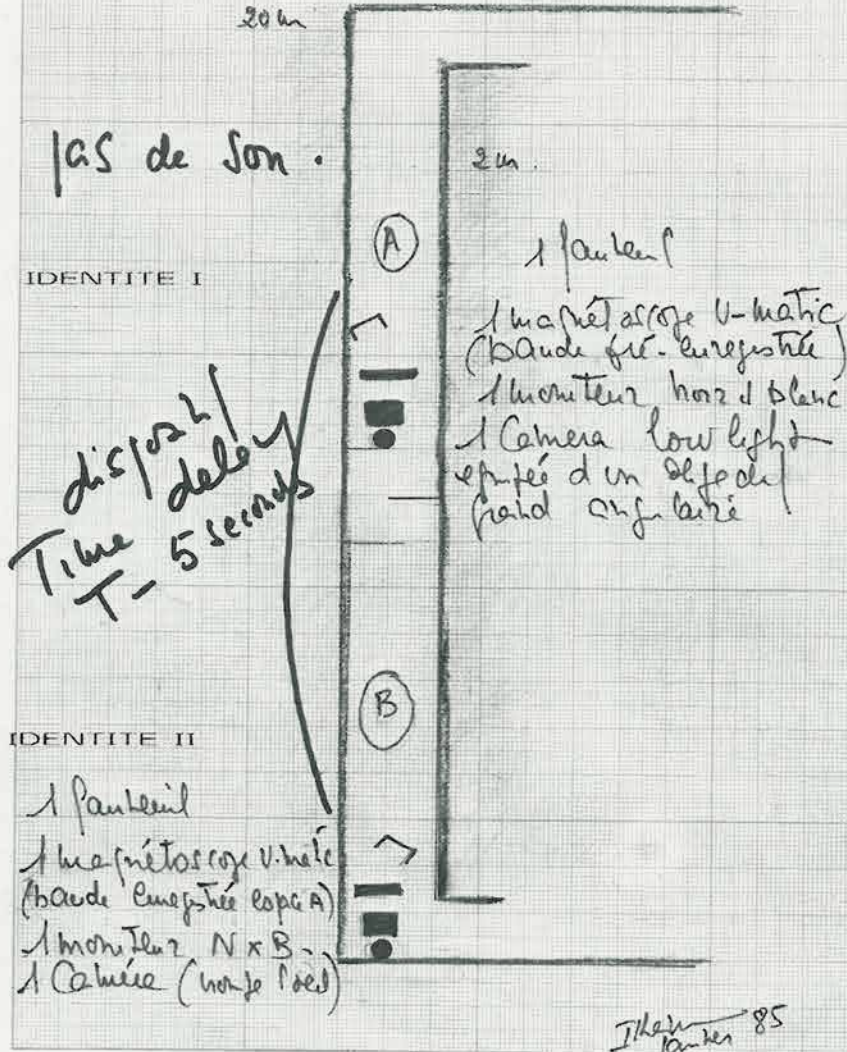


Spectrograph of stars. By the time their signal reaches us, they may already be extinct.

# exit chamber

Life, meaning—are they still given to us by a mother, as a message to decipher, to be honoured and returned to her when the time comes? Doesn't our way of receiving them, of knowing them, of transforming them, of representing them, of acquitting ourselves of them, inflict an injury to the ancient conviction that the soul is be returned intact, perfect? If not a disavowal, at least a disruption?

Fragment of the wall of the temple of Karnak North. Montage by Marianne Peltzer using a procedure devised by Jiří Kolář.

The same bas-relief as in the entrance chamber, but projected as a jittering image. The matter-effect is absent. On the soundtrack, silence.
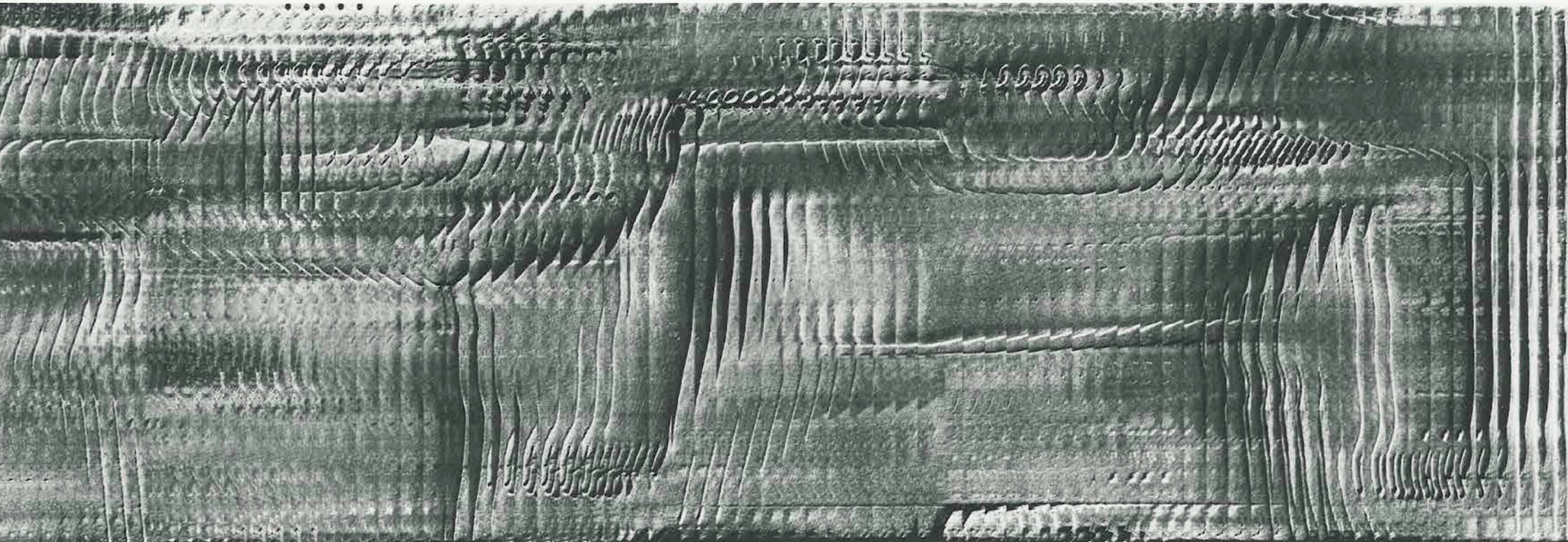
# cine-immaterials

Movement through a series of immobile images: it is to this constitutive determination that cinema owes its existence as a site for immaterials. Since it is made up of a rhythmic throughput of fixed instants, cinematographic motion is always and by its very nature immaterial.

Narrative cinema above all developed the dramatic motion of cinema and its fictional power to immaterialize all the productions of the imagination (from the invisible man to the incredible shrinking man). Born of a scientific quest for knowledge of motion, the cinema, in its scientific usage, continues to explore phenomena of all kinds, spatially (from the infinitely small to the infinitely large) and temporally (from the infinitely slowed down to the extremely accelerated). In contrast, a simple raw document can be a curiosity that sometimes manifests an unusual space-time. But cinema is also appreciated for itself by artists who, with their filmic and machinic experiments with all kinds of cinema-materials, forcefully demonstrate all that cinema can show, even including movements that can be seen but could never happen materially; in doing so, these artists do not limit themselves to photographic cinema alone, but also practice graphic cinema, electronic cinema (also called video), and even holographic cinema (see the site 'simulated depth').



1



2



3



4

1. The chronophotography of E.J. Marey, 1882. The first portable photographic camera.

2. Still from Robert Aldrich's film *The Legend of Lylah Clare*, 1968.

3. Michael Snow's omnidirectional device for shooting, used in his film *La région centrale*, 1970–1971.

4. Amoeba photographed by Doctor Comandon, c.1930.

Photos and documents recto
1. From *La Nature*,
22 April 1882.
2. *Cahiers du cinéma*
3. Cinédoc
4. Institut Pasteur

The Cine-Immatérials site is a set of forty-five screenings using transversal themes (see opposite) to group together films and videos from narrative and scientific cinema, raw documentary footage where only the referent matters, and art cinema in which experimentation with film is the most highly developed. For this programme (which cannot claim to be exhaustive but is more than just an 'exhibition audiovisual'), the films and videos have been chosen for the specific interest of each one but also for the assonances or resonances between them and with the sites in the exhibition.

- Anemic Cinema (and its remedies)
- Objective Moon
- Digital-Analogue Hybrids
- Representatives of Representation
- Flashes of Light
- Movement of Immobilities
- Grains of Light
- All Kinds of Stories
- Cinematic Machines
- Trajectory and Labyrinths
- The Eye at the Camera
- Skin on Skin
- Immaterial Crises
- Colours in Motion
- Dimensions
- Adventures of Perception
- See/Name/Show
- Transitions

The programme includes works by:

| | | | | |
|---|---|---|---|---|
| Robert Abel & Associates | Tony Conrad | Hervé Huitric | Georges Méliès | Alfons Schilling |
| Alexandre Alexeïeff | Cranston & Csuri | Ken Jacobs | Mory Menken | Paul Sharits |
| Kenneth Anger | Charles Dekeukelaire | Bela Julesz | Vincente Minnelli | Michael Snow |
| Jack Arnold | Patrick Delabre | Jerzy Kawalerowicz | Issey Miyake | Sogitec/Renault |
| Eloïse Araujo | Digital Production | Kurt Kren | Jacques Monory | Steina |
| Dominique Avron | Jean Dréville | Peter Kubelka | Monique Nahas | Woody Vosulka |
| Bruce Baillie | Marcel Duchamp | Mike Kuchar | NASA | Dziga Vertov |
| Gianfranco Baruchello | Eric Duvivier | George Kuchar | Werner Nekes | Andy Warhol |
| Stephen Beck | Charles Eames | Fritz Lang | Mike Nichols | Wim Wenders |
| Samuel Beckett | Claudine Eizykman | Christion Lebrat | Pat O'Neill | James Whale |
| Dominique Belloir | Ed Emshwiller | Nicole M. Le Douarin | Osaka University | John & James Whitney |
| Jean-Michel Bouhours | Louis Feuillade | Fernand Léger | Jean Painlevé | Dominique Willoughby |
| Stan Brakhage | Guy Fihman | Maurice Lernaître | Jean-Ciaude Pecker | Etienne Wolff |
| Robert Breer | Hollis Frampton | Steven Lisberger | Michael Powell | Harold Zirin |
| Mel Brooks | Mourice Françon | Auguste and Louis Lumière | Ron Resch | |
| Tod Browning | Ernie Gehr | Len Lye | Ron Rice | Design |
| Günter Brus | Jean-Luc Godard | Jean-François Lyotard | Hans Richter | CINEDOC/CINE MBXA |
| Robert Cahen | Shalom Garewitz | Norman Mclaren | Eric Rohmer | Claudine Eizykman |
| Peter Campus | Larry Gotheim | Benoît Mandelbrot | Pierre Rovere | Guy Fihman |
| Henri Chomette | Peter Greenaway | Man Ray | Roy Rowland | |
| Jean Comandon | Wojciech Has | Chris Marker | Richard Rush | Organisation |
| Emile Cohl | David Haxton | Gregory Markopoulos | Walter Ruttmann | Jenny Davidson |
| Bruce Conner | Gary Hill | Jonas Mekas | La Samaritaine | Patrick de Haas |
| | | | | Dominique Willoughby |

# sounds and voices

*What could be more immaterial than sounds produced without one being able to see how they are made? What could be more material than the machines that make and manipulate these sounds? IRCAM presents four series of concerts creating a continual counterpoint between sounds created artificially, without human gesture, and sounds/interventions produced directly with instruments and voices. Between these two universes, continual transformations that make materials into the immaterial.*

## four series of concerts organised by IRCAM, from 5 March to 3 June 1985.

In the first series, Luigi Nono's work *Guai ai Gelidi Mostri* (French première) combines vocal writing in the tradition of the Venetian madrigalists with the most cutting edge electroacoustic research being undertaken by The experimental studio of the Heinrich Strobel Foundation of the Südwestfunk Freiburg.

The second series, through the works of the winners of the 12th International Competition for electroacoustic music in Bourges (1984) and three works for instrumentalists with electronics, provides a grand panorama of the latest research in the use of cutting-edge devices [*matériaux*].

In the third series, Karlheinz Stockhausen presents his first works made at IRCAM, *Kathinka's Gesang* (world première) along with other recent works in which 'live' electronics are combined with acoustic instruments.

In the fourth series, voices take the place of instruments in counterpoint with electroacoustic research, in particular in *Chant de l'amour*, a world première by Gérard Grisey.

## soundtrack

**Development of Texts**
Dolorès Rogozinski
**Design and direction of soundtracks**
Gérard Chiron (Service audiovisuel)
**Design of musical environment**
Arnaud Petit (IRCAM)
**Assistant**
Catherine Charpentier
**Head of Production**
Annyck Graton
**Musical works created at IRCAM and performed by the Ensemble Intercontemporain**

**With the support of**
Bibliothèque publique de l'information (BPI)
Direction du Développement Culturel, ministère de la Culture
HMS
Institut de Recherche et de Coordination Acoustique/Musique (IRCAM)
La Villette—Cité des Sciences et de l'Industrie
Philips Portenseigne

## musical works
## used in soundtrack

Jean-Baptiste Barrière, *Chréode*
Luciano Berio, *La voix des Voies*
John Chowning, *Stria-Turenas*
Jonathan Harvey, *Bhakti–Mortuos Plango, Vivos Voco*
York Holler, *Arcus—Resonnance*
Thierry Loncino, *Profondeur de champs*
Alain Louvier, *Casta Diva*
Tod Machover, *Fusione Fugace*
Mesios Maiguashca, *'F Melodies'*
Philippe Manoury, *Zeitlauf*
Tristan Murail, *Desintegrations*
Arnaud Petit, *Espace et Pleurs*
Jean-Claude Risset, *Songes*

## texts and voices

### Entrance Corridor and Entrance Chamber
Soundtrack: Gérard Chiron

### Theatre of the Non-Body
Samuel Beckett, *The Unnamable / L'innomable*, Ed. de Minuit.
Voice: Jean-Claude Fall

### Vain Nakedness/Second Skin/The Angel
Antonin Artaud, 'To have done with the judgement of God' / 'Pour en finir avec le jugement de Dieu', *Œuvres complètes XII*, Ed. Gallimard.
Text by Dolorès Rogozinski
Voices: Fabrice Dague, Arnaud Petit, Dolorès Rogozinski

### Exploded Body/'Infra-Thin'/Elusive Surface
Marcel Proust, *The Guermantes Way /*

*Du côté de Guermantes*, Ed. Gallimard, coll. La Pléiade.
Voice: Serge Maggiani

### Indiscernables
Gaston Bachelard, *The New Scientific Spirit / Le nouvel esprit scientifique*, Ed. PUF. *L'activité rationaliste de la physique contemporaine*, Ed. PUF.
Voice: Marc Ogeret

### Dematerialised Material
Soundtrack: Gérard Chiron, Arnaud Petit

### Luminescent Painting/Bodiless Painter/All Kinds of Copies
Henri Michaux, *Emergences-Résurgences*, Ed. Albert Skira.
Octavio Paz, *The Monkey Grammarian / Le singe grammairien*, Ed. Albert Skira.
Maurice Blanchot, *The Laughter of the Gods / Le rire des dieux*, Ed. Nouvelle Revue Française.
Voice: Serge Maggiani

### All kinds of skins/ Chessgame / Registration / Hidden Variables
Text by Dolorès Rogozinksi.
Stéphane Mallarmé, 'Un coup de dés jamais d'abolira le hasard', *Œuvres complètes*, Ed. Gallimard.
Voice: Georges Werler.

### Little Invisibles/Flat Architecture
Henri Michaux, *Emergences—Résurgences*, Ed. Albert Skira.
Voice: Fabrice Dague

### Invisible Man / Compartment / Hurried Eater
Maurice Blanchot, *Thomas the Obscure /*

*Thomas l'obscur*, Ed. Gallimard.
Eugène Savitzkaya, *Les morts sentent bon*, Ed. de Minuit.
Voice: Fabrice Dague, Arnaud Petit

### Auto-Generation
Heinrich von Kleist, *On the Marionette Theatre / Sur le théâtre des marionnettes*, Ed. Traversière.
Voice: Serge Maggiani

### Shadow of a Shadow/Trace of a Trace/Reciprocal Space/Stolen Light
Jacques Roubaud, 'Ombre: éloge inverse', from the journal *Change International*.
Voice: Arnaud Petit

### Unrepresentable/Calculated Images
Jorge Luis Borges, 'On Rigour in Science' / 'De la rigeur de la science', *Histoire de l'infamie*, Ed. UGE, coll. 10/18.
Jean Baudrillard, 'The Precession of Simulacra' / 'La précession des simulacres', *Traverses* 10, Ed. Centre Georges Pompidou/CCI.
Voice: Marc Ogeret, Georges Werler

### Simulated Aroma/Painted Scent
A. Bioy Casares, *The Invention of Morel / L'Invention de Morel*, Ed. UGE, coll, 10/18.
Voice: Georges Werler

### Simulated Visits/Simulated Depth/Inverted Reference
Paul Virilio, 'Dromoscopy' / 'La dromoscopie', *L'horizon négatif*, Ed. Galilée.
Voice: Michaël Lonsdale

### Speed Dressing/The Three Mothers
Hans Christian Andersen, 'The Emperor's New Clothes' / 'Le costume neuf de l'Empereur', *Contes*, Ed. Gallimard.

François Rabelais, *Gargantua*, Ed. de Seuil.
Voice: Diane Niedermann, Jean-Jacques Ofterdinger.

### Precooked-Prespoken
Roland Barthes, *The Empire of Signs / L'empire des signes*, Ed. Albert Skira.
Lewis Carroll, *Alice Through the Looking Glass / De l'autre côté du miroir*, Ed. Aubier Flammarion.
Voice: Diane Niedermann, Marc Ogeret.

### Painted Trade/Currency of Time
J.-J Goux, 'Les étalons figuratifs', *Sexualité et politique*, Actes du Colloque de Milan, Ed. UGE, coll. 10/18.
Voice: Serge Maggiani

### Neglected Terrain/All Kinds of Authors
Yves Klein, 'La maison immatérielle', Les symboles du lieu, l'habitation de l'homme, *Les cahiers de l'Herne 44*. Ed. Herne.
Roland Barthes, *The Empire of Signs / L'empire des signes*, Ed. Albert Skira.
Roland Barthes, 'Death of the Author', 'From Work to Text' / 'La mort de l'auteur', 'De l'œuvre au text', *Le bruissement de la langue*, Ed. du Seuil.
Voice: Marc Ogeret, Georges Werler

### Labyrinth of Language
Jorge Luis Borges, 'The Library of Babel' / 'La bibliothèque de Babel', *Fictions*, Ed. Gallimard/Folio.
Voice: Michaël Lonsdale

### Exit Corridor and Exit Chamber
Soundtrack: Gérard Chiron

# further reading

## ideas

- Adorno T.W. *Modèles critiques*, Paris: Payot, 1984.
- Baudrillard J., *À l'ombre des majorités silencieuses, ou la fin du social*, Paris: Cahiers d'Utopie, 1978.
- Baudrillard J., *Le miroir de la production*, Paris: Castermann, 1973.
- Bell D., *The Coming of Post-Industrial Society*, London: Heinemann, 1974.
- Deleuze G., *Logique du sens*, Paris: Ed. de Minuit, 1969.
- Derrida J., *La carte postale*, Paris: Flammarion, 1979.
- *Europe 1995. Mutations technologiques et enjeux (Rapport Fast)*, Paris: CEE/Futuribles, 1983.
- Feyerabend P., *Contre la méthode*, Paris: Seuil, 1979.
- Habermas J., *Connaissance et intérêt*, Paris: Gallimard, 1976.
- Habermas J., *Raison et légitimité*, Paris: Payot, 1978.
- Horkheimer M., *Eclipse de la raison*, Paris: Payot, 1974.
- *Innovation/Renovation: New Perspectives on the Humanities* (ed. Hassan I. and Hassan S.), Madison: The University of Wisconsin Press, 1983.
- Lyotard J.-F., *La condition postmoderne*, Paris: Ed. de Minuit, 1979.
- Lyotard J.-F., *Le différend*, Paris: Ed. de Minuit, 1979.
- Nora P. and Mine A., *L'informatisation de la societé*, Paris: Seuil, 1979.
- Packard U., *L'homme remodelé*, Paris: Calmann-Levy, 1979.
- Partant F., *La fin du développement*, Paris: Maspero, 1982.
- Schlatter C., *Les années 80*, Paris: Flammarion, 1984.
- Serres M., *Hermes I, II, III, V, VI*, Paris: Ed. de Minuit, 5 vols., 1969–1980.
- Touraine A., *La société postindustrielle*, Paris: Denoel, 1969.
- Tricot B. et al., *Informatique et libertés*, Paris: La Documentation française, 1975.
- Wiener N., *Cybernetique et société*, Paris: 10/18, 1960.

## languages

- Barthes R., *Essais critiques IV: Le bruissement de la langue*, Paris: Seuil, 1984.
- Berrendonner A., *Éléments de pragmatique linguistique*, Paris: Ed. de Minuit, 1982.
- Bourdieu P., *Ce que parler veut dire. L'économie des echanges linguistiques*, Paris: Fayard, 1982.
- Calvino I., *La machine litterature*, Paris: Seuil, 1983.
- *« 1984 » et les présents de l'univers informationnel*, Paris: Centre Georges Pompidou/ Centre de Création Industrielle, 1985.
- Ducrot O., *Dire et ne pas dire*, Paris: Hermann, 1972.
- Flahault F., *Jeu de Babel*, Paris: Point Hors Ligne, 1984.
- Lauriere J.-L., 'Un moteur d'inférences pour systèmes experts en logique du premier ordre', *Snark*, Paris: Institut de programmation nº. 430, November 1983.
- Lauriere J.-L., 'Intelligence artificielle', *La Recherche*, nº. 140, 1983.
- Lussato B., *Le défi informatique*, Paris: Fayard, 1981.
- Moreau R., *Ainsi naquit l'informatique*, Paris: Dunod, 1982.
- *The Myths of Information: Technology and Post-Industrial Culture* (ed. Woodward K.), Madison: Coda Press, 1980.
- Oulipo, *La littérature potentielle*, Paris: Gallimard, 1973.
- *Le point sur la reconnaissance et la synthèse de la parole*, Paris: Ed. Agence de l'informatique, 1982.
- Sola Pool I. de, *On Free Speech in an Electronic Age*, Cambridge, MA: Harvard University Press, 1983.
- *Télématique. Le choc des générations?* (Servan-Schreiber J.-J., et Garrigues C., ed.), Paris: Ed. Economica, 1983.
- Vessilier-Ressi M., *Le métier d'auteur. Ecrivains, compositeurs, cinéastes, auteurs de théâtre et de radio-télévision*, Paris: Dunod, 1982.
- Watzlawick P. et al., *Une logique de la communication*, Paris: Seuil, 1972.
- Weizenbaum J., *Puissance de l'ordinateur et raison de l'homme*, Paris: Ed. d'Informatique, 1981.

# ways of being

• 'Après Seveso... La techno-democratie, mode d'emploi', *Esprit*, double issue 8–9, August-September 1983.
• Bannon L., Barry U., Holst O., *Information Technology, Impact on the Way of Life*, Dublin: Tycooly International Publishing, 1982.
• Beaud P., *La société de connivence. Media, médiations et classe sociale*, Paris, Aubier-Montaigne, 1984.
• Cohendet P., and Billon J.-F., 'Les enjeux économiques de la biotechnologie', *L'innovation. Vers une nouvelle révolution technologique*, Paris: La Documentation française, 1983.
• 'Les créateurs. Arts, Sciences et technologies', *Autrement*, nº. 48, March 1983.
• Dranov P., Moore L., Hickey A., *Video in the 80's: Emerging Uses for Television in Business, Medicine and Government*, New York: Knowledge Industry Publications, 1983.
• *Écrans pour tous? Démocratie locale et nouvelles technologies de communication*, Paris: Centre Georges Pompidou/Centre de Création Industrielle, 1983.
• Fischler C., 'Le ketchup et la pilule', *Prospective et santé*, nº. 25, Summer 1983.
• Flichy F., *Les industries de l'imaginaire*, Grenoble: Presses Universitaires de Grenoble, 1980.
• Goody J., *Cuisines, cuisine et classes*, Paris: Centre Georges Pompidou/Centre de Création Industrielle, 1984.
• 'Humeur de la mode', *Autrement*, special issue 62, 1984.
• *Informatique et société*, Paris: La Documentation française 1981.

• 'Informatique matin, midi... et soir', *Autrement*, special issue 37, February 1982.
• Lemoine-Luccioni E., *La robe. Essai psychanalytique sur le vêtement*, Paris: Seuil, 1984.
• Loftus G. et Loftus E., *Mind at Play: The Psychology of Videogames*, New York: Basic Books, 1983.
• Metayer G., *La société malade de ses communications*, Paris: Dunod, 1980.
• Millot C., *Hors sexe, essai sur le transsexualisme*, Paris: Point Hors Ligne, 1983.
• 'La mode', *Traverses*, nº. 3, Paris: Centre Georges Pompidou/Centre de Création Industrielle, February1976 (republished 1984).
• 'Modernes. Et après? Les Immatériaux', *Autrement*, March 1985.
• "Nourrir demain les hommes', *Prospective et santé*, special issue 25, Spring 1983.
• *Les outils de communication aujourd'hui et demain*, Marseille: CESIA, 1984.
• Pastré O., *L'informatisation et l'emploi*, Paris: La découverte/Maspero, 1983.
• "La peau sous toutes les coutures', *Prospective et santé*, special issue 27, Winter 1983.
• Raymond J., *L'empire transsexuel*, Paris: Seuil, 1981.
• Reichler C. et al., *Le corps et ses fictions*, Paris: Ed. de Minuit, 1983.
• Revillard J., Oudot J., Morgon A., *Les effets pervers de la communication humaine*, Lyon: Presses Universitaires de Lyon, 1984.
• Rihoit C. et Nolais J., *Histoire de Jeanne transsexuelle*, Paris: Ed. Mazarine, 1980.

• Salomon J.-J., *Prométhée enchainé. La résistance au changement technique*, Paris: Pergamon, 1981.
• Shearer A.-F., Huxford M., *Communications and Society, a Bibliography on Communication Technologies and their Social Impact*, London, New York: Greenwood Press, 1983.
• Stoller R.-J., *Sex and Gender*, New York: Sciences House, 1968.
• 'Les symboles du lieu, l'habitation de l'homme», *Cahiers de l'Herne*, nº. 44, 1983.
• Tremollieres J., *Nutrition*, Paris: Dunod, 1977.
• Von Impe J.-L., Schweiger B., *Videotex, possibilités et applications*, Paris: Ed. d'Organisation, 1984.

# fields of knowledge

• Audauze J., 'Astronomie', E*ncyclopedia Universalis*, Paris: 1983.
• 'L'astronomie de l'invisible', *Sciences et avenir*, special issue 33, 1981.
• Changeux J.-P., *L'homme neuronal*, Paris: Fayard, 1983.
• Daudin A., *Le code génétique*, Paris: Fayard, 1983.
• *Encyclopédie de l'astronomie moderne*, Paris: Ed. Hachette,1983.
• Feynman R., Leighton R.-B., Sands M., *Le cours de physique de Feynman*, London: Addison-Wesley, 1970.
• 'La génétique et l'hérédité', *La Recherche*, special issue 155, May 1984.
• Hoffmann P. and Paty M., *Science et conscience. Les deux lectures de l'univers*, Paris: Stock, 1980.
• Jacob F. et al. , *Sciences de la vie et société*, Paris: La Documentation française/Seuil, 1979.
• Jacquard A., *Au péril de la science*, Paris: Seuil, 1982.
• Jacquard A., *Éloge de la difference. La génétique et les hommes*, Paris: Seuil, 1978.
• Kirtel C., *Introduction à la physique de l'état solide*, Paris: Dunod, 1972.
• Kuhn T., *La structure des révolutions scientifiques*, Paris: Flammarion, 1972.
• Laborit H., *La nouvelle grille. Pour décoder le message humain*, Paris: Laffont, 1974.

# further reading

## expertise

- Mandelbrot B., *Les objets fractals. Forme, hasard et dimension*, Paris: Flammarion, 1975.
- Mendel A., *Les manipulations génétiques*, Paris: Seuil, 1980.
- Messiah A., *Mécanique quantique*, Paris: Dunod, 2 vols., 1960.
- Noel E. et al., *La matière aujourd'hui*, Paris: Seuil, 1981.
- 'Les origines de la biologie moléculaire' (Lwoff A. et Ullmann A. ed.), *Études vivantes*, Paris, 1980.
- Popper K., *Logique de la découverte scientifique*, Paris: Payot, 1973.
- Prigogine I., Stengers I., *La nouvelle alliance*, Paris: Gallimard, 1979.
- Reeves H., *Patience dans l'azur*, Paris: Seuil, 1981.
- 'La revolution biologique', *Sciences et vie*, nº. 775, April 1982.
- Solomon M., *L'avenir de la vie*, Paris: Seghers, 1981.
- 'La science des robots', *Science et vie*, special issue, 1982.
- Thom R., *Modèles mathématiques de la morphogenèse*, Paris: 10/18, 1974.
- Thuillier P., *Les biologistes vont-ils prendre le pouvoir?*, Bruxelles: Ed. Complexe, 1981.
- Weinberg, S., *Les trois premières minutes de l'univers*, Paris: Seuil, 1978.

- Arghieri E., *Technologie appropriée ou technologie sous-developppée?* Paris: Presses Universitaires de France, 1981.
- 'L'avenir des images', *Sciences et avenir*, special issue, 29, 1976.
- Barbet P., *Les énergies nouvelles*, Paris: La decouverte/Maspero, 1983.
- 'La biotechnologie à la croisée des chemins', *La Recherche*, nº. 147, 1983.
- 'Biotechnologies', *Enjeux*, nº. 34, March 1983.
- Collier R.-J., Burkhardt C.B., Lin L.-H., *Optical Holography*, New York: Academic Press, 1971.
- Evans C., *Les géants minuscules. Memoires du futur*, Paris: Inter Editions, 1980.
- Goutras N., 'La monnaie électronique', *Journal officiel*, Paris, 1982.
- Gille B., *Histoire des techniques*, Paris: Gallimard, 1978.
- Guillon B., *Stratégie des groupes multimédia*, Paris: La Documentation française, 1984.
- *Havas Hebdo*. Revue de presse, Paris: Havas, Direction de la prospective, from 1981.
- "Images de synthèse", *Sonovision*, nº. 278, January 1985.
- 'Images de synthèse. Un nouveau monde cree par l'ordinateur', *Sciences et techniques*, special issue, May 1984.
- Miquel P., *Histoire de la radio et de la télévision*, Paris: O. Perrin, 1984.
- Pelissolo J.-C., *La biotechnologie demain*, Paris: La Documentation française, 1980.
- Perrin J., *Les transferts de technologie*, Paris: La découverte/Maspero, 1983.

- *Premier colloque image* (Biarritz, May 1984), Paris: GRETSI/CESTA, 2 vols., 1984.
- Privat A., 'Le cablage du cerveau', *Sciences et avenir*, nº. 446, April 1984.
- 'Rapport sur l'état de la technique. La revolution de l'intelligence', *Sciences et techniques*, special double issue 97–98, October 1983.
- *Recherche et Technologie*, Paris: La Documentation française, 1982.
- 'La révolution des images', *La Recherche*, special issue 144, May 1983.
- 'Les rhétoriques de la technologie', *Traverses*, nº. 26, Paris: Centre Georges Pompidou/Centre de Creation Industrielle, 1984.
- 'Les enjeux de la robotique', *Futuribles*, special issue 83, 1983.
- Roqueplo P., *Penser la technique*, Paris: Seuil, 1982.
- Roqueplo P., Zeitoun J., *Cultiver la technologie. Création et technologies*, Paris: Dalloz, 1983.
- Toffler A., *La troisième vague*, Paris: Denoei/Gonthier, 1980.
- Verdier E., *La bureautique*, Paris: La découverte/Maspero, 1983.
- 'Videotex', *Réseaux*, special issue 6 et 7, April/June 1984.

## sensibilities

- *AMC*, nº. 41, 1977; nouvelle série, nº. 6, December 1984.
- 'Architecture', *La modernité ou l'ésprit du temps*, Paris: Les éditions L'équerre/Biennale de Paris, 1982.
- *Arte povera piu azione povere*, Salerno: Rumma ed., 1969.
- Battier M., *Musique et informatique: Une bibliographie indexée*, Ivry-s/Seine: Elmeratto, 1978.
- Beardsley J., *Earthworks and Beyond: Contemporary Art in the Landscape*, New York: Abbeville Press Publishers, 1984.
- Bellair D., 'Video Art Explorations', *Cahiers du cinéma*, special issue, October 1981.
- Benjamin W., 'Petite histoire de la photographie', 'L'œuvre d'art à l'ère de sa reproductibilité technique', *Poésie et revolution*, Paris: Denoel, 1971 .
- Blau H., *Blooded Thought: Occasions of Theater*, New York: Performing Arts Journal Publications, 1982.
- Boulez P., *Points de repère*, Paris: Ed. Christian Bourgois, 1981.
- Boulez P., *Le Temps musical, II. Matériau et invention musicale, II/. L'œil et l'oreille* (ten audio cassettes in three series), Paris: IRCAM/Radio France, from 1980.
- Bourdieu P., *Un art moyen*, Paris: Ed. de Minuit, 1965.
- Brown F., *La musique par ordinateur*, Paris: Presses Universitaires de France, 1982.
- Buchloh B.H.D., *Formalisme et historicité. Autoritarisme et régression*, Paris: Ed. Territoires, 1982.

- Cott J., *Conversations avec Stockhausen*, Paris: Jeon-Cioude Lottes, 1979.
- Celont G., *Ambiente/Arte. Dal futurismo alle Body Art*, Venise: Ed. La Biennale di Venezio, 1977.
- Dovol J.-L., *La photographie: histoire d'un art*, Geneva: Skira, 1982.
- Duguet A.-M., Video. *La mémoire au poing*, Paris: Hachette, 1981.
- De Stijl. *Visions of Utopia*, Oxford: Phaidon Press, 1982.
- Fihman G., Eizykmon C., 'Cinéma et holographie', *Actes du 75e Congrès de l'Union internationale des Associations techniques cinématographiques* (October 1984), Paris: UNIATEC, 1985.
- François J.-C., 'The Garden of Delights', *Percussive Notes/Research Editions*, vol . 21, nº. 3: University of Illinois ot Urbana, March 1983.
- Griffiths P., *A Guide to Electronic Music*, London et New York: Thames ond Hudson, 1979.
- *Hans Rucker and Co*, Frankfurt: DAM, 1984.
- Held M., Naylor C., Walsh G., *Contemporary Photographers*, New York: MacMillan, 1982.
- *Idea as Model*, New York: Rizzoli, 1981.
- *If I Had a Mind... (Ich stelle mir vor...): Concept Art, Project Art*, Cologne: Du Mont Schouberg, 1971.
- *Images et imaginaires d'architecture*, Paris: Centre Georges Pompidou/ Centre de Création Industrielle, 1984.

- Kahmen V., *La photographie est-elle un art?*, Paris: Ed. du Chêne, 1974.
- Komar V., 'Sur le cinéma théâtral holographique', *Actes du 2e Congrès de l'Union internationale des Associations techniques cinematographiques* (October 1976), Moscow: UNIATEC, 1976.
- Koolhaas R., *New York Delire*, Paris: Ed. du Chêne, 1978.
- Krauss R.E., *Passages in Modern Sculpture*, Boston: The MIT Press, 1981.
- 'Luigi Nono', *Musik-Konzepte*, nº. 20, July 1981.
- Lossole H. (ed.), *Artamericain*, Paris: Centre Georges Pompidou/ Musée national d'art moderne, 1981.
- Lemogny J.-C., *La photographie créative*, Paris: Creofts, 1983.
- Lista G., *Futurisme. Manifestes, Documents, Proclamations*, Lausanne: L'âge d'homme, 1973.
- *Malevitch. Architectones*, Paris: Centre Georges Pompidou/ Musée national d'art moderne, 1978.
- Nono L., *Texte. Studien zu seiner Musik*, Zurich et Fribourg: Atlantis Verlag, 1975.
- *Die Revision der Moderne. Potsmoderne Architektur 1960–1980*, Munich: Prestel Verlag, 1984.
- Roche D., *La disparition des lucioles. Réflexion sur l'acte photographique*, Paris: Ed. de l'Etoile, 1982.
- Schaeffer P., *De la musique concrète à la musique même*, Paris: Ed. Richard Masse, 1977.

- Schaeffer P., *Traité des objets musicaux*, Paris: Seuil, 1966.
- Varese E., *Ecrits*, Paris: Ed. Christian Bourgois, 1983.
- Virilio P., *L'espace critique*, Paris: Ed. Christian Bourgois, 1984.
- Virilio P., 'La ville surexposée', *Change International*, nº. 1, February 1984.
- 'La voix, l'écoute», *Traverses* nº. 20, Paris: Centre Georges Pompidou/ Centre de Creation Industrielle.
- Wedewer R., Fischer K., *Conception*, Cologne and Opladen: Westdeutscher Verlag, 1969.
- *When Attitudes Become Form (Works, Concepts, Processes, Situations, Information)*, Bern: Kunsthalle Bern, 1969.
- *Who's Who in Rock Video*, London: Zomba Books, 1983.

# acknowledgements