CROSS MEDIA MAPPING

A visual report

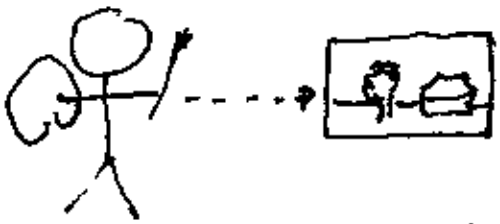
T. E. BATTEN
Amsterdam, Oct. 87

Chapter 0

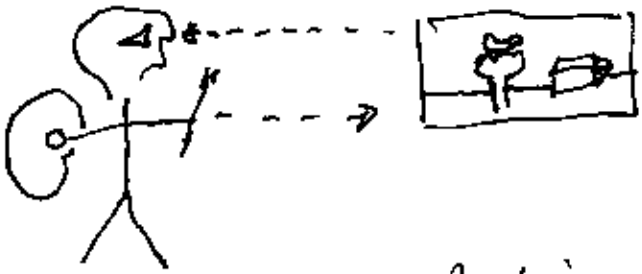
INTRODUCTION

ART

EXPRESSION



DIALOGUE



Art is not Expression !

The Art
is to build a conceptual machine
That
Can facilitate
The Dialogue

COMPUTER

The computer is a switching machine

Where
The physical laws
are only valid
on the level of the switching process
But not on the
cause (logic)
or the interpretation
of the switching

The Computer is a
simulation Machine

It can simulate

Existing → Understood → COMMERCE
Existing → Not-understood → RESEARCH
Non-Existing → Understood → GAMES
Non-Existing → Not-understood → ART

Axiom of imaginary machines (Scientific American)
- A linguistic machine
- An ontological machine

VARIOUS SIMULATION TYPES

- Business Graphics
- Scientific Image Processing
- Computer Graphics
  - (Advertising: Not functional but pretty
  - { CAD/CAM: functional and not pretty

- Computer Art
  (Artistic Practice)
  As Tool - image orientated (painting?)
  (ease and speed)
  (informal - computer invisible)
  (modern - paint box, Photoshop

  As medium - System/Process (sculpture?)
  (complexity + aesthetic choice)
  (formal - computer visible)
  (traditional - artist/programmer)

- Art Information Theory
  (Not yet developed)

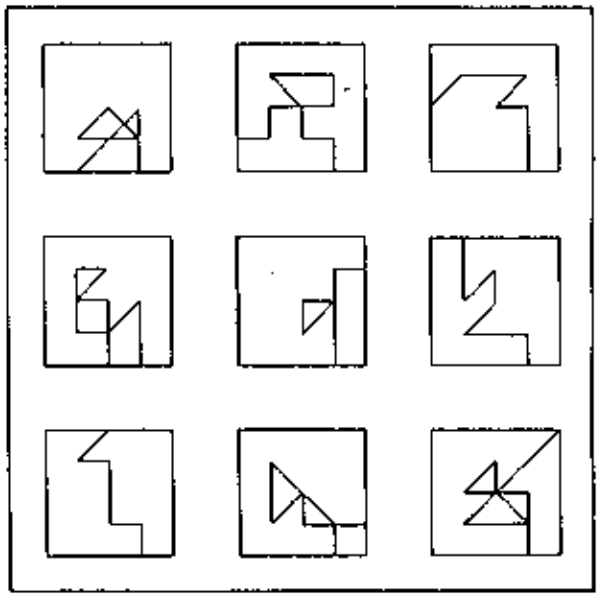
Note: These are not static categories and are liable to change.
- Tool / Medium contrast likely to remain!

CHAPTER 1

ENGLAND (67 - 72)

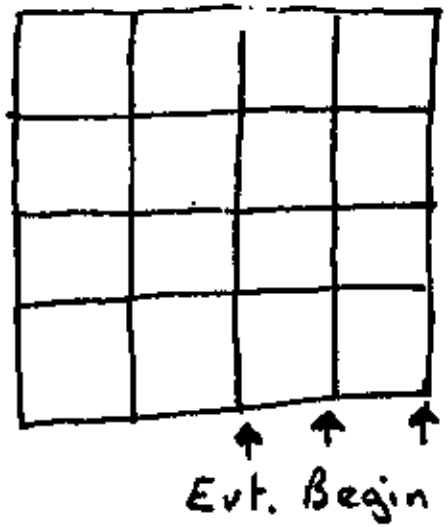
First Experiments

- random
- repetition
  - (rotation)
  - (mirror)
- extrapolation
- Programming faults

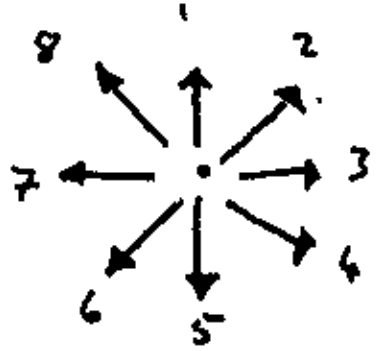


Nine Random Walks (1967)

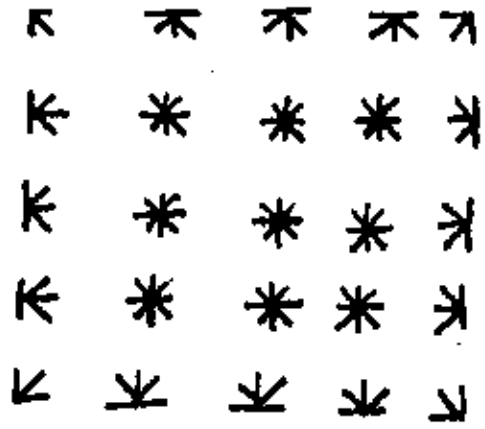
GRID

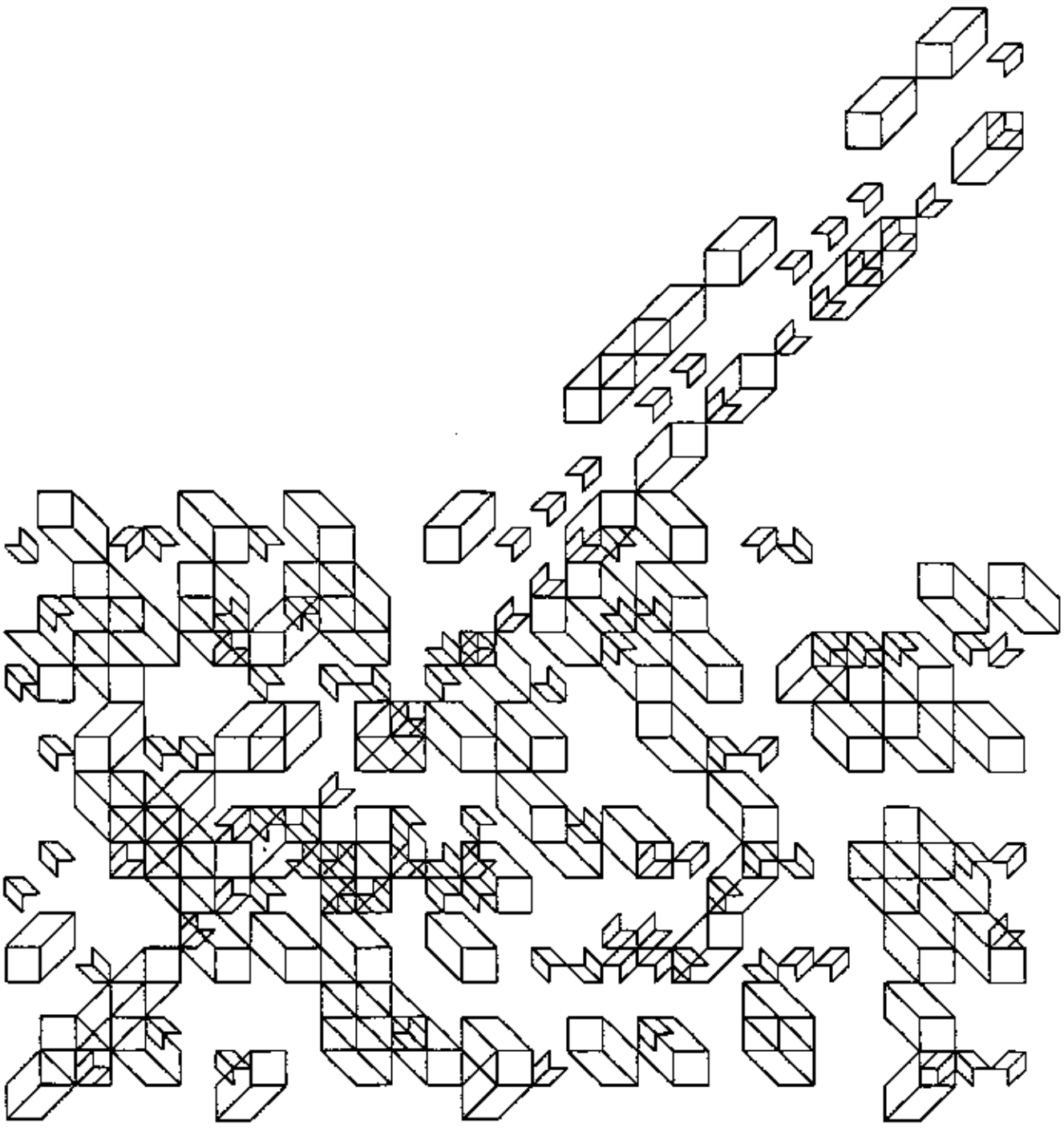


Possible Directions

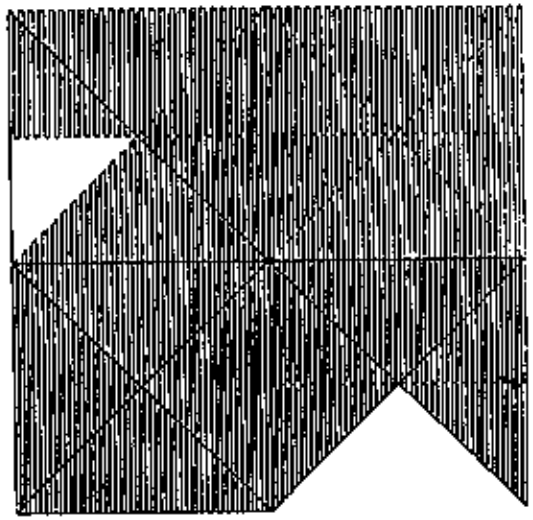


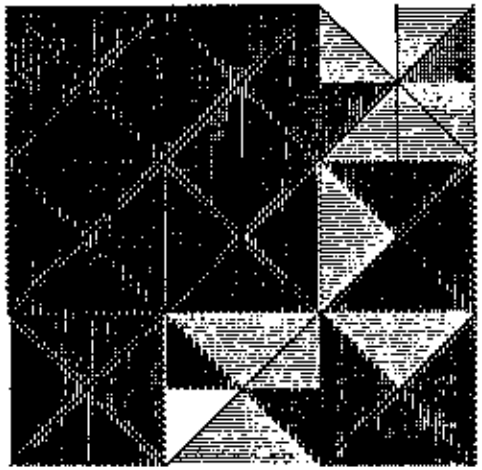
Permitted Directions

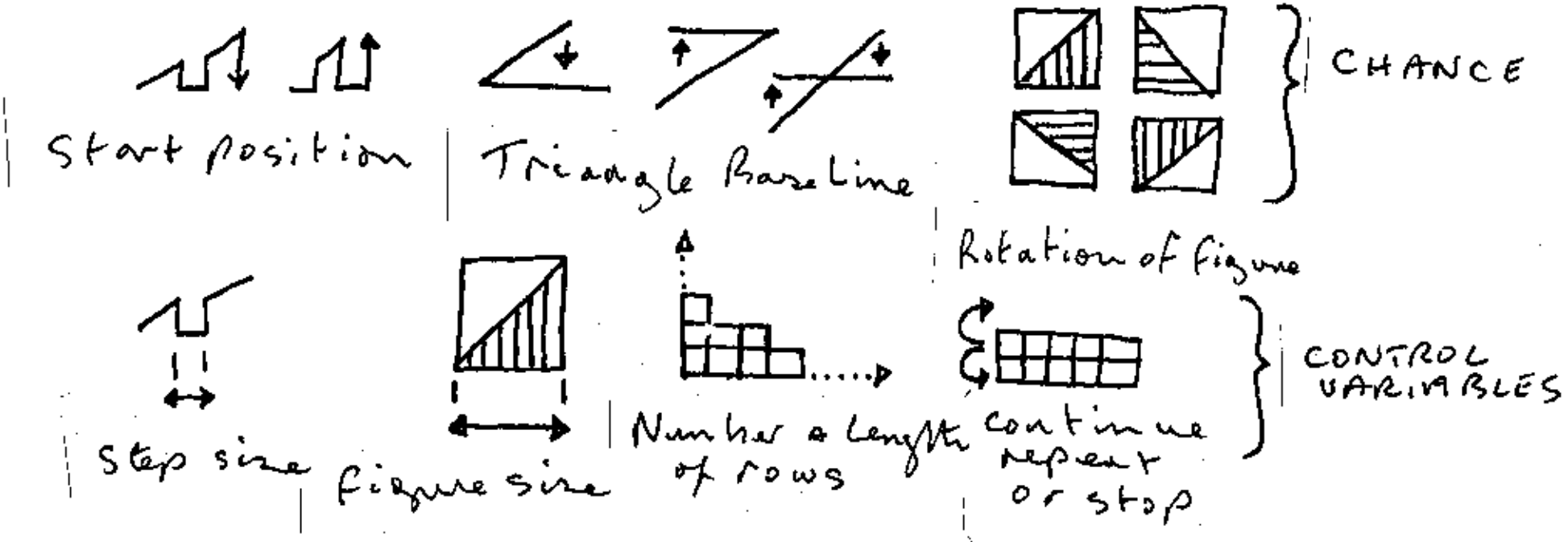


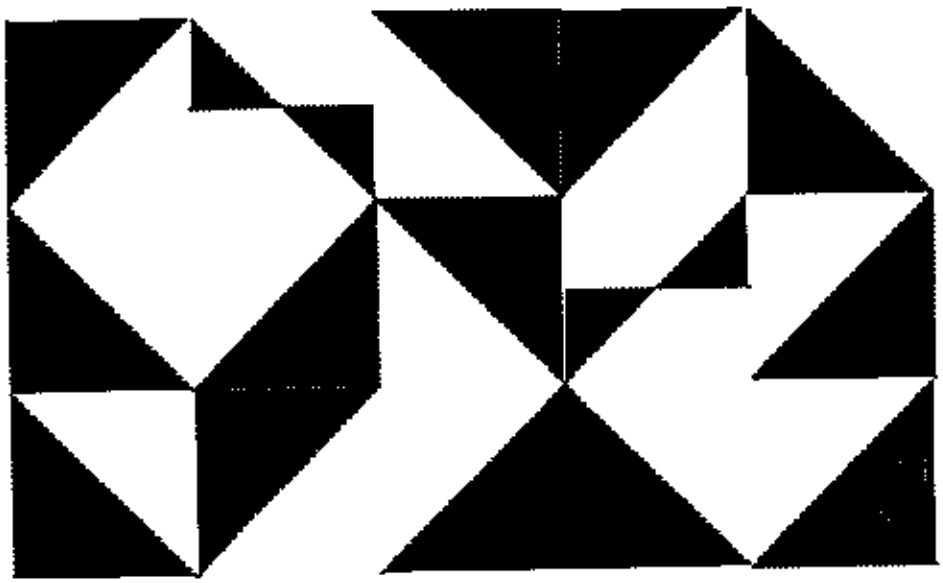


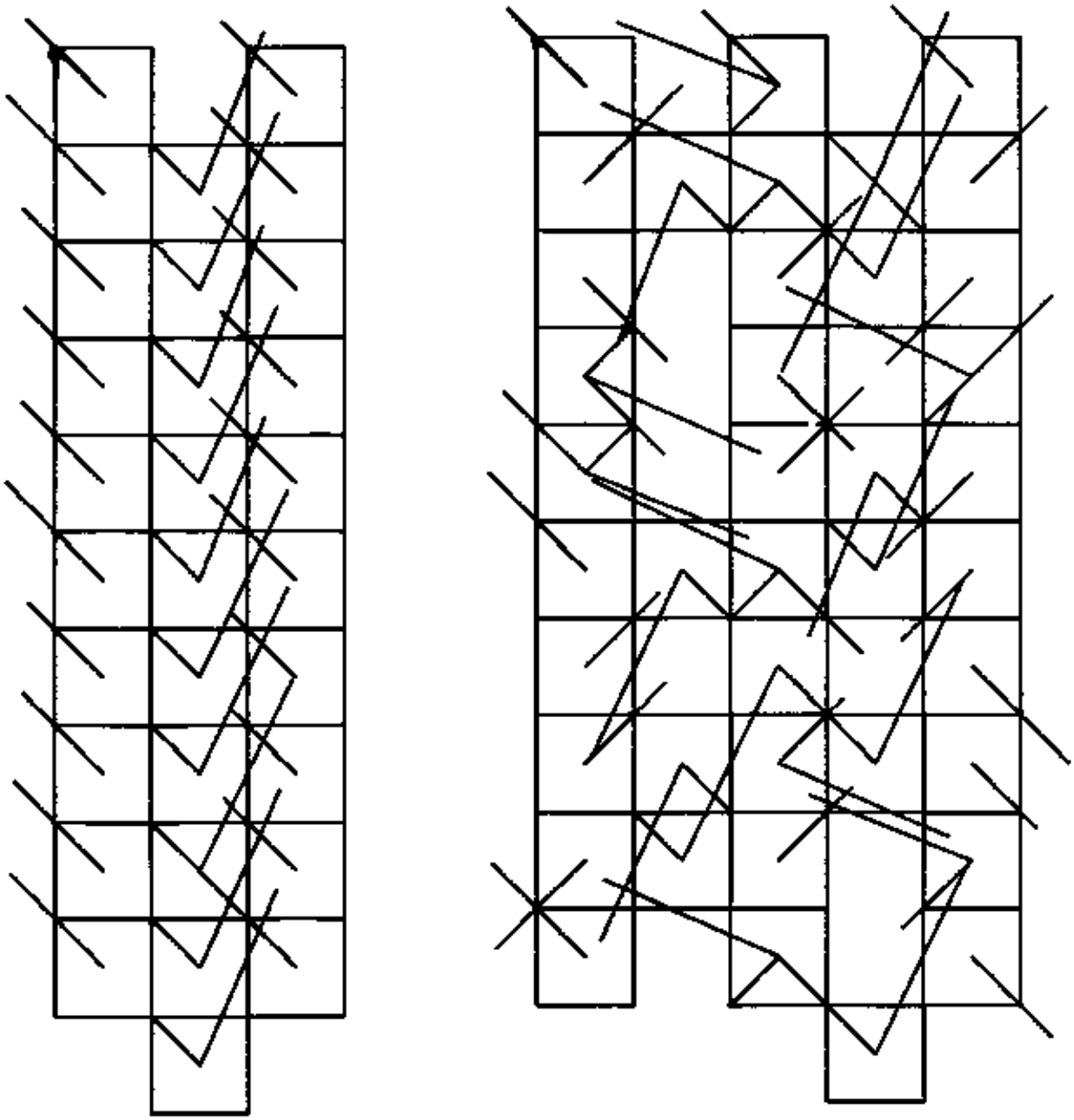
Rotated Zig-Zag (1971)











CHAPTER 2

UTRECHT
- The search for MORE

Personal Starting Points:

(SONOLOGY UTRECHT 1972)

1. Computer ⇒

input ⇒ process ⇒ output

can be seen as separate modules

ie.

stockexchange ⇒ music process ⇒ image

2. Personal Confrontation ⇒

Sculptor

in Electronic Music Environment

CONCLUSION

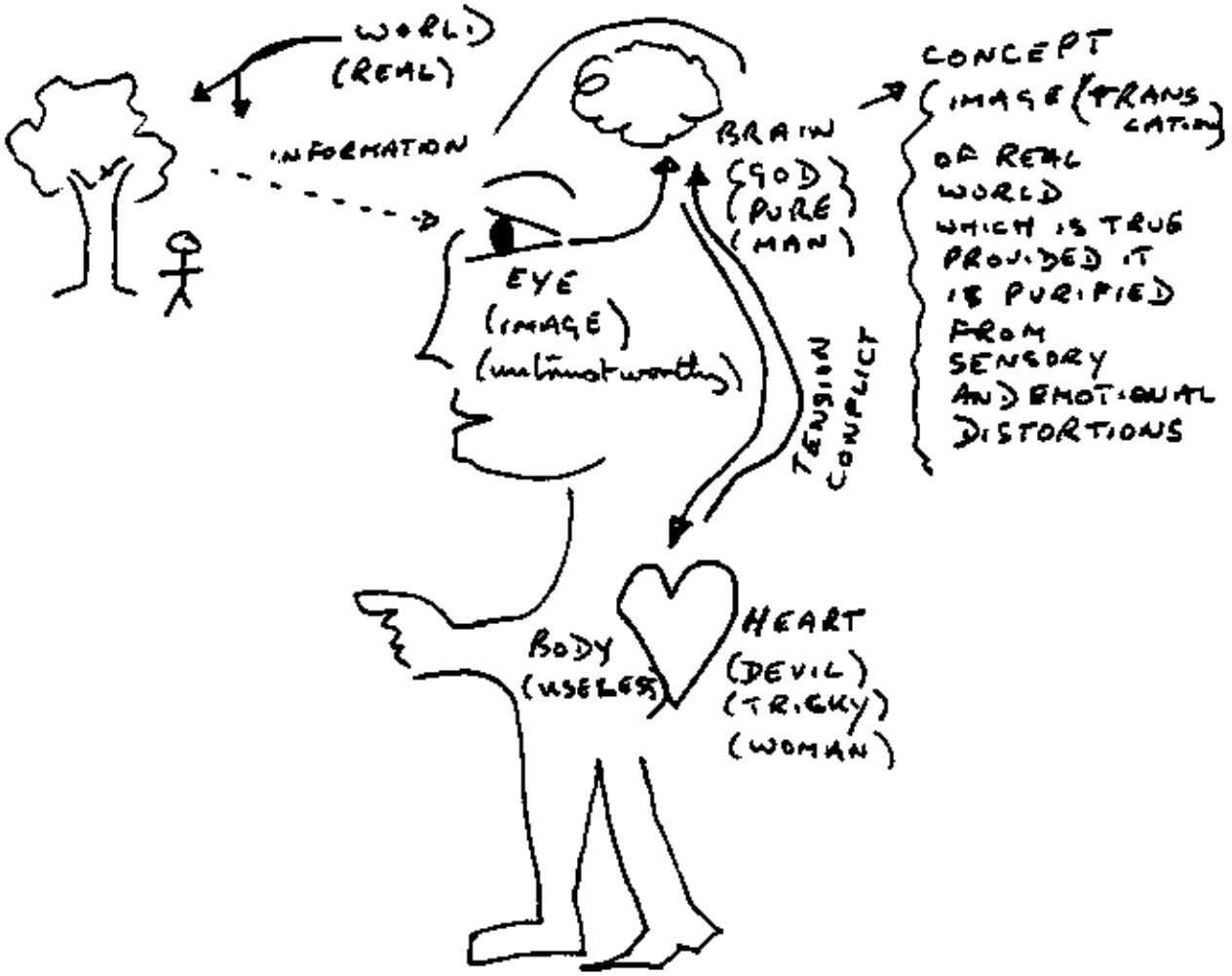
REAL TIME (VIDEO) TRANSLATION

IMAGE / SOUND

{ not at carrierwave level but structural level }

A STRANGE MODEL WHICH APPEARS TO BE OFTEN BELIEVED (BY MEN)

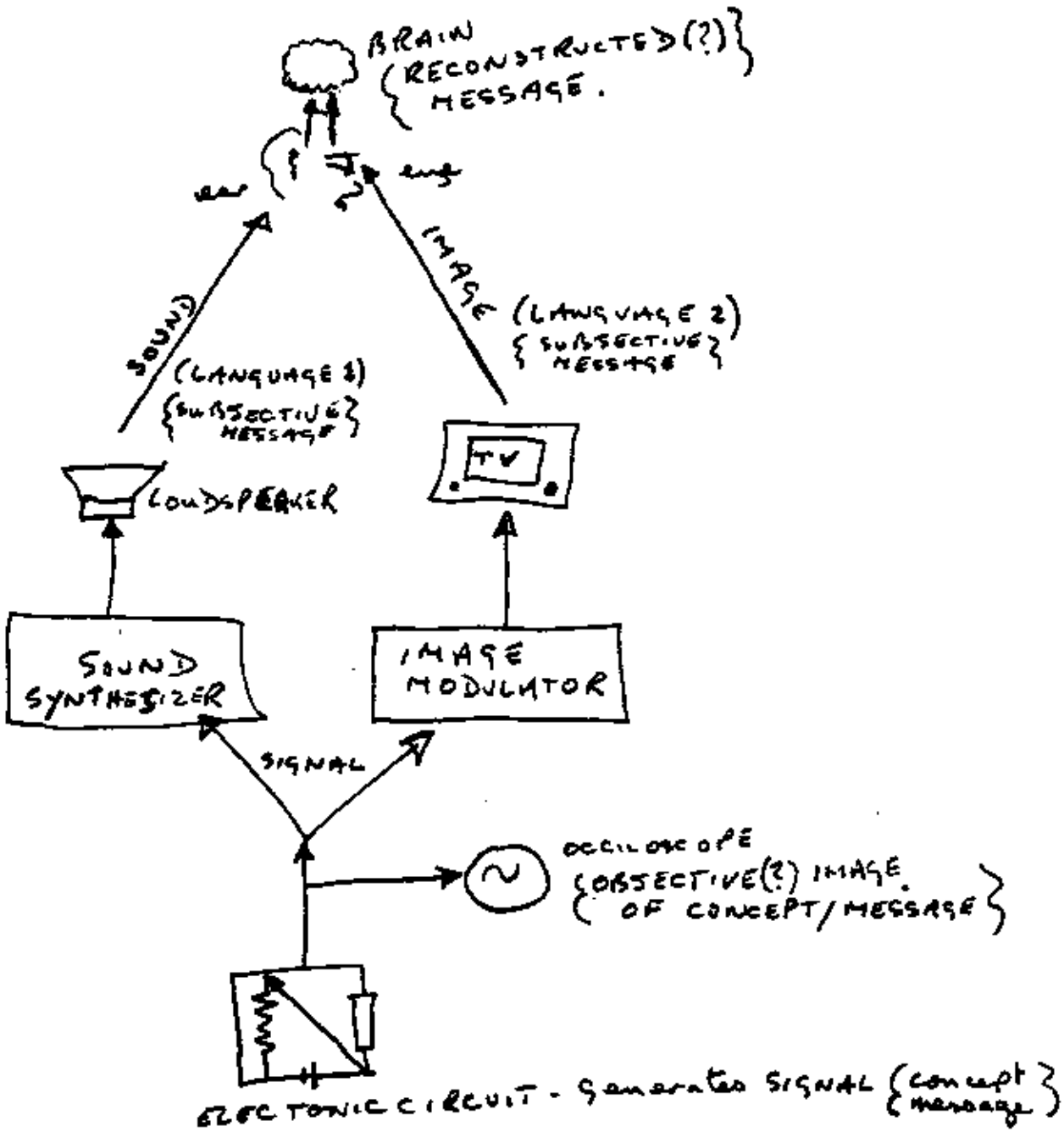
Says STEINA



AN EXPERIMENT

(↓ MODEL OF SUBJECTIVE TRANSLATION OF CONCEPT.)

CONCRETE



VOLTAGE LEVELS / SOUND / IMAGE are carriers of information

INFORMATION is considered to be a formal relationship

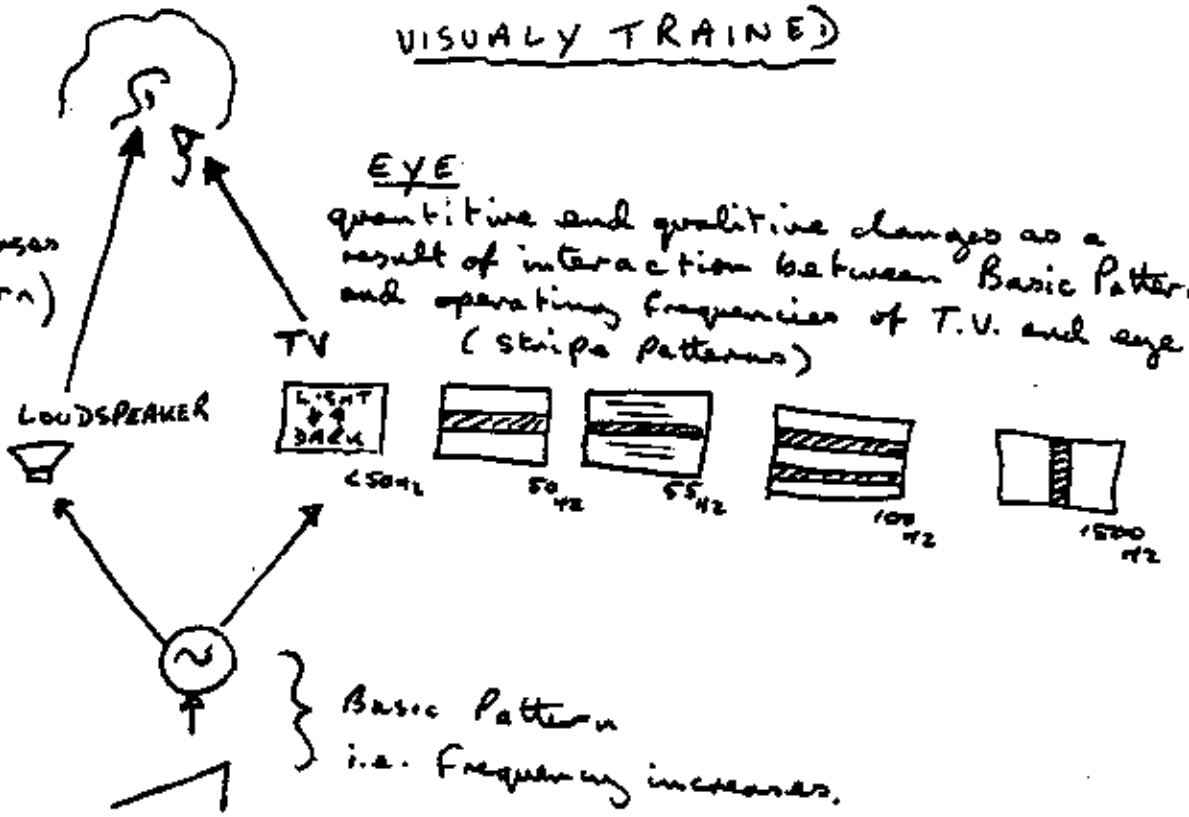
i.e. "A" is getting Louder

"B" is leaning to the Left.

WHAT HAPPENS?

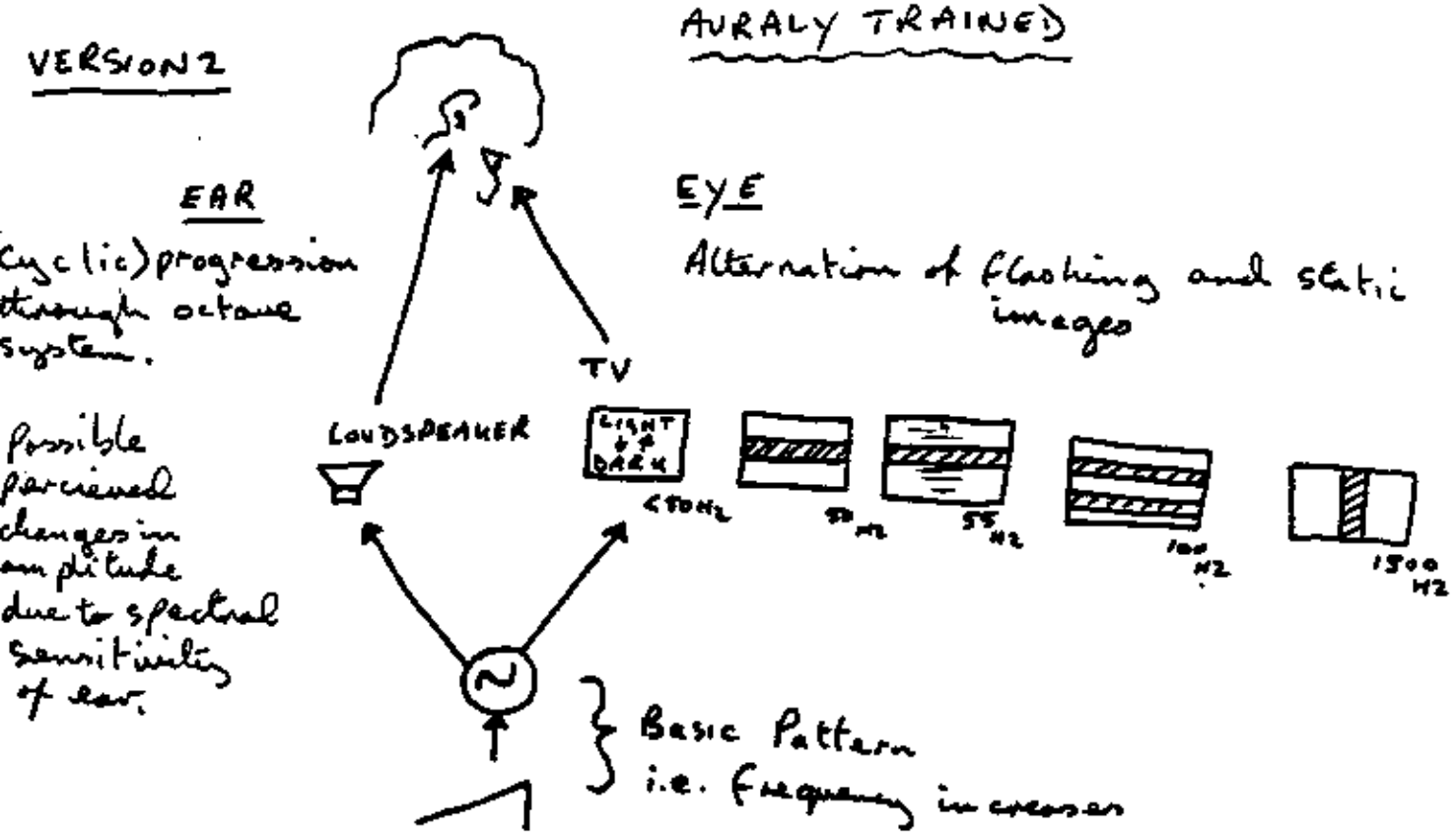
VERSION 1

VISUALY TRAINED



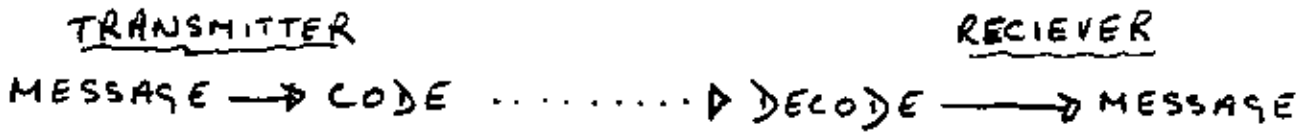
VERSION 2

AURALY TRAINED

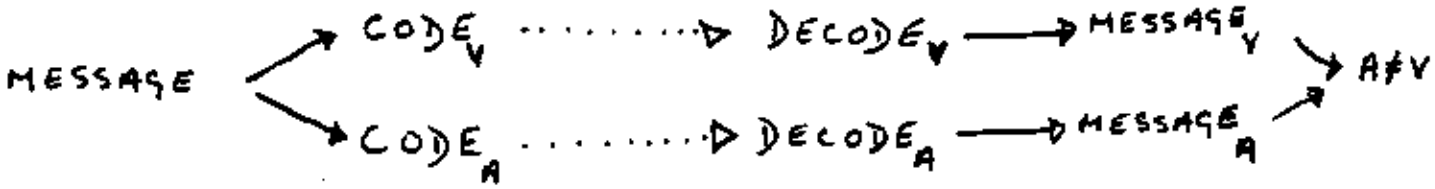


MEDIA DISTORTION :

A simple communication model is:



The model in the experiment was:



What caused the difference?

- Variation in geometry of Image/Sound generators
- Variation in geometry of Visual/aural perception
- (Personal) variation in (geometry of) conceptual analysis of Image/Sound
- Speed of neural processing of Image/Sound

IS THE COMMUNICATION MODEL STILL RELIABLE WHEN THE MESSAGES DIFFER AS A RESULT OF APPLYING THE MODEL IN PARALLEL?

Note:

The work at The Institute for Sonology in Utrecht

was done in the analogue studio

For video documentation see:

http://www.li-ma.nl/site/catalogue/art/trevor-batten/audio-visual-experiments/174

In the above studies there is a fundamental asymmetry between sound and image:

A simple oscillator can generate sound
-but would would be an equivalent "image generator"?

For a more recent digital simulation

of a study for a video based image generator
see:

The Death of Platonicism

Programme Notes:
A series of Java Applets based on a simple simulation of a TV screen with a variable pulse (delay and width) controlled via the interface.
The process works in real-time and the image is the direct result of the interacting frequencies used.

Philosophically the works demonstrate that not all images need to be representations of a Platonic concept existing outside the image.

In this case, there is no bit mapped image: The image is created in real-time as the combined result of interactions between the various frequencies involved (processing the data in the computer, presenting the results on a screen, perceiving it with the eye and processing it in the brain.

http://www.tebatt.net/JAVAGALLERY/SKETCHES/PERCEPTION/Plato-Demos/PlatoInfo.html

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There is also a semantic problem:

What is an "image"

(an image of what?)

AN INTRODUCTION TO CROSS MEDIA MAPPING

[illegible]

CHAPTER 3

MORE BITS

DIGITALIA AGAIN!

Financial and technical circumstances force a return to digital computer

↓

decisions

a) Real time (video) image synthesis too complex

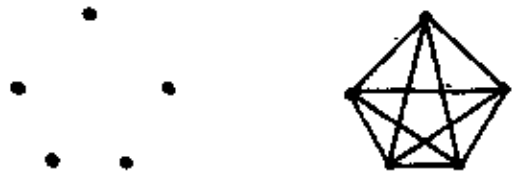
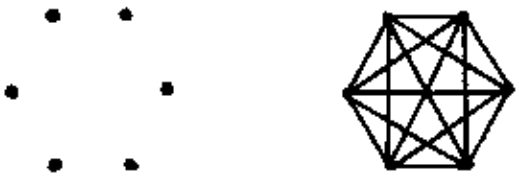
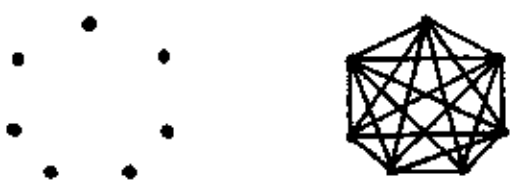
b) Sound is extra complication (without real training)

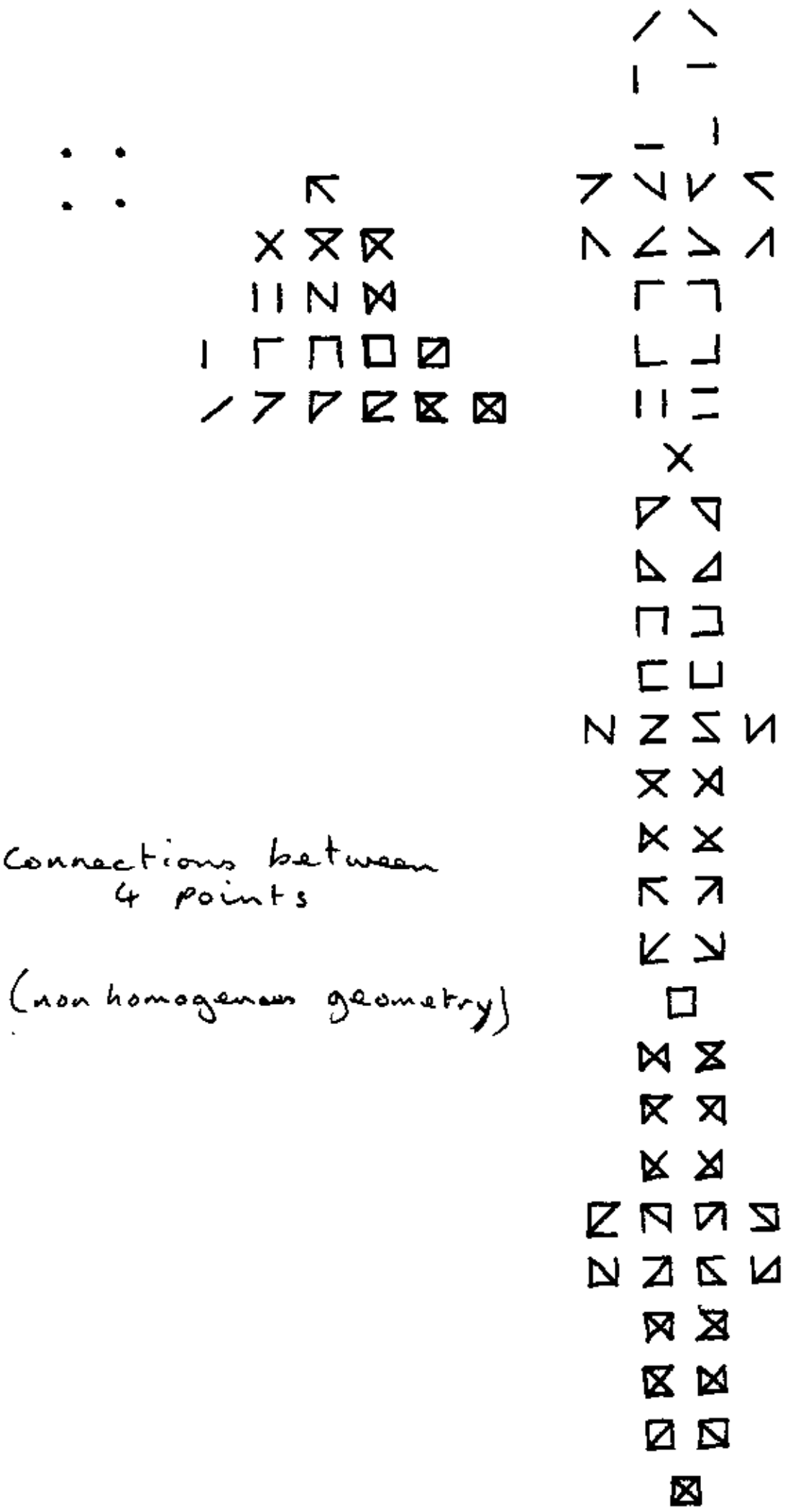
Limit research to GRAPHIC TRANSLATIONS (plotter)

+ THEORY

(WHAT IS AN IMAGE?)

Connections between Points

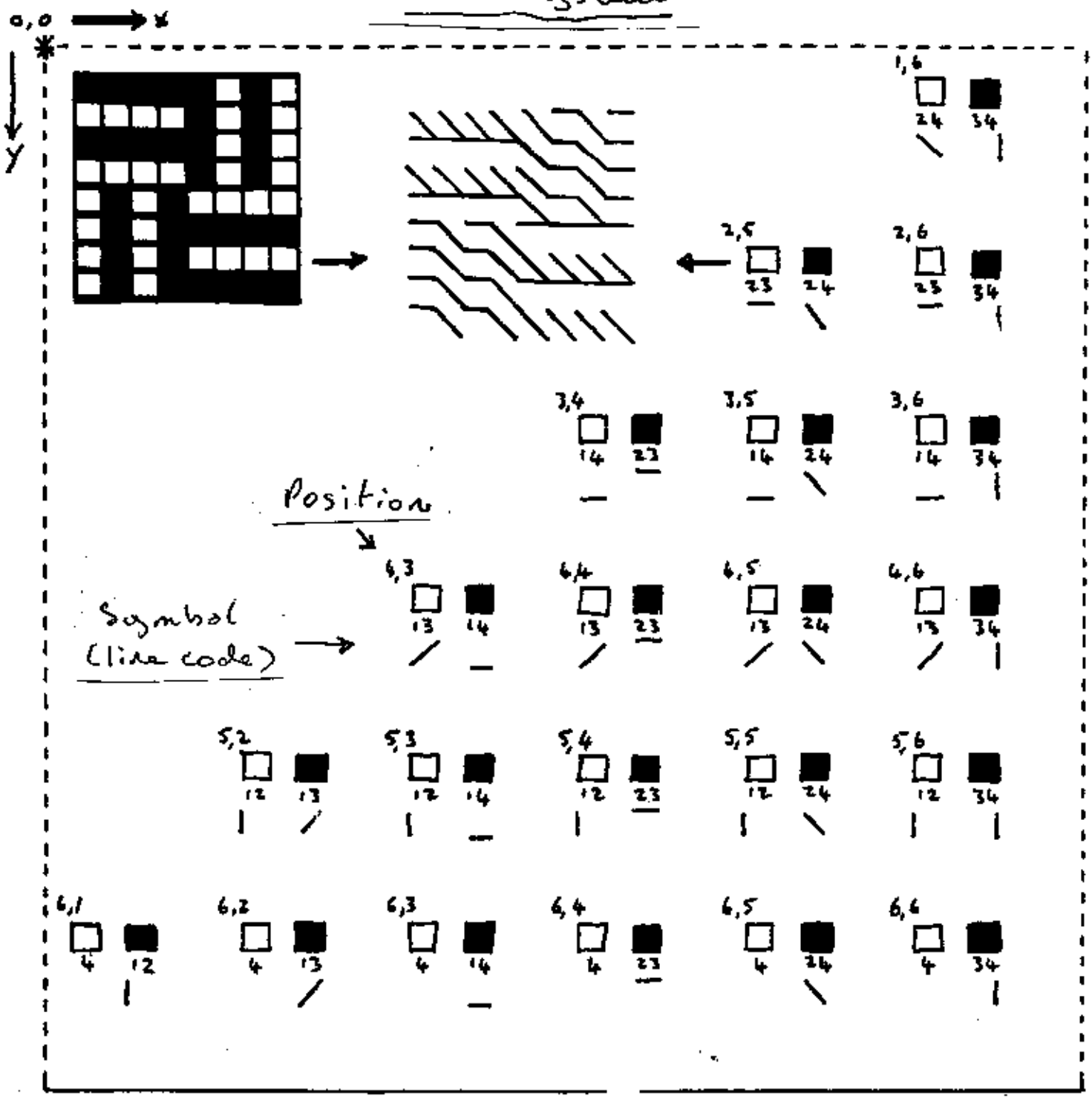
No. of Points		No. of Connections
1		0
2		1
3		3
4		6
5		10
6		15
7		21
		$V = P \times (P-1)/2$
8		28



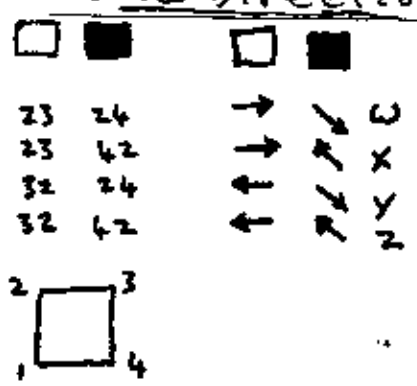
Connections between
4 points

(non homogenous geometry)

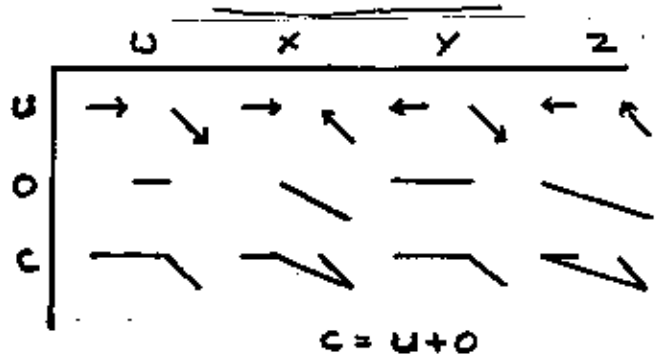
Basic System

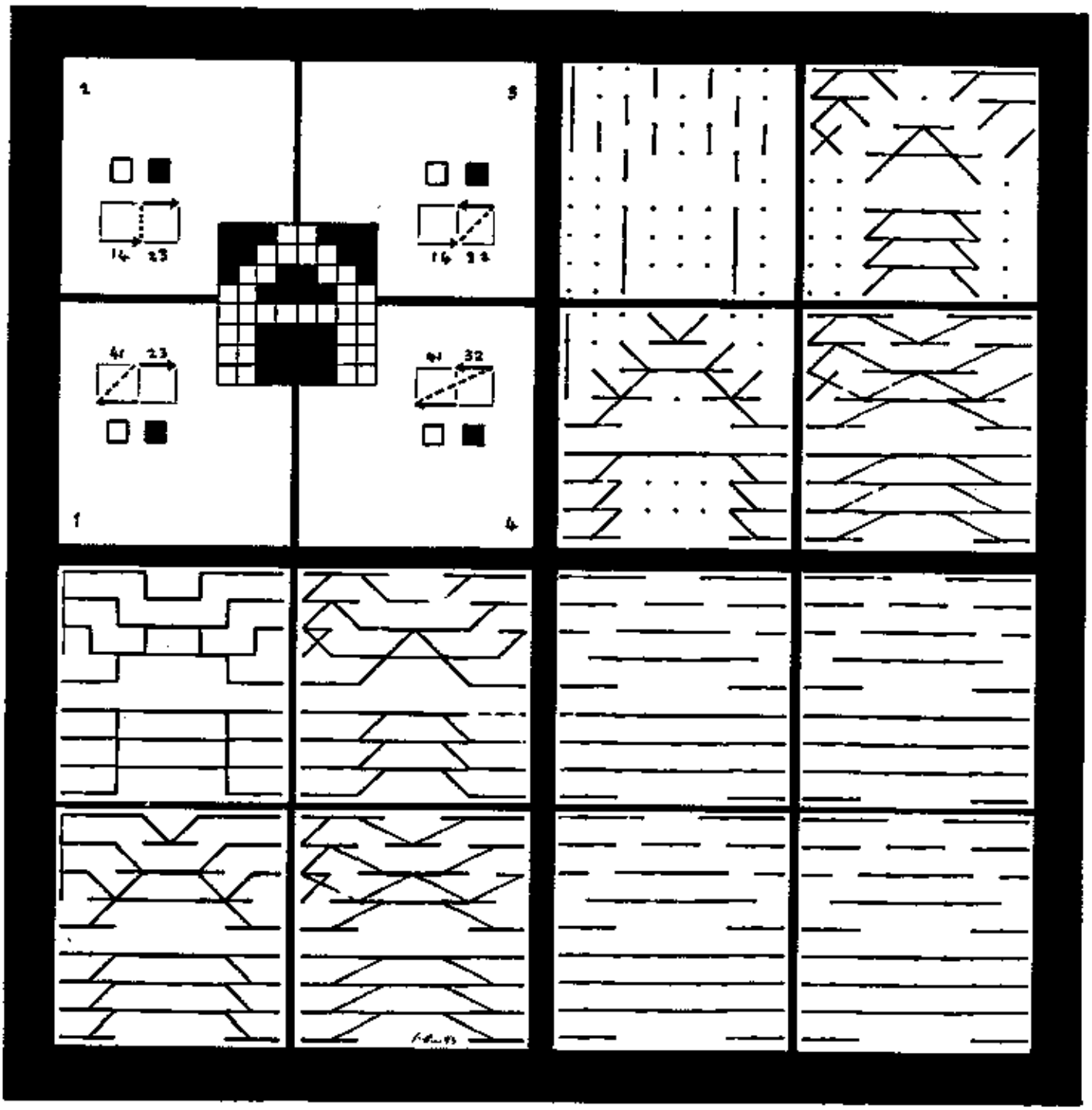


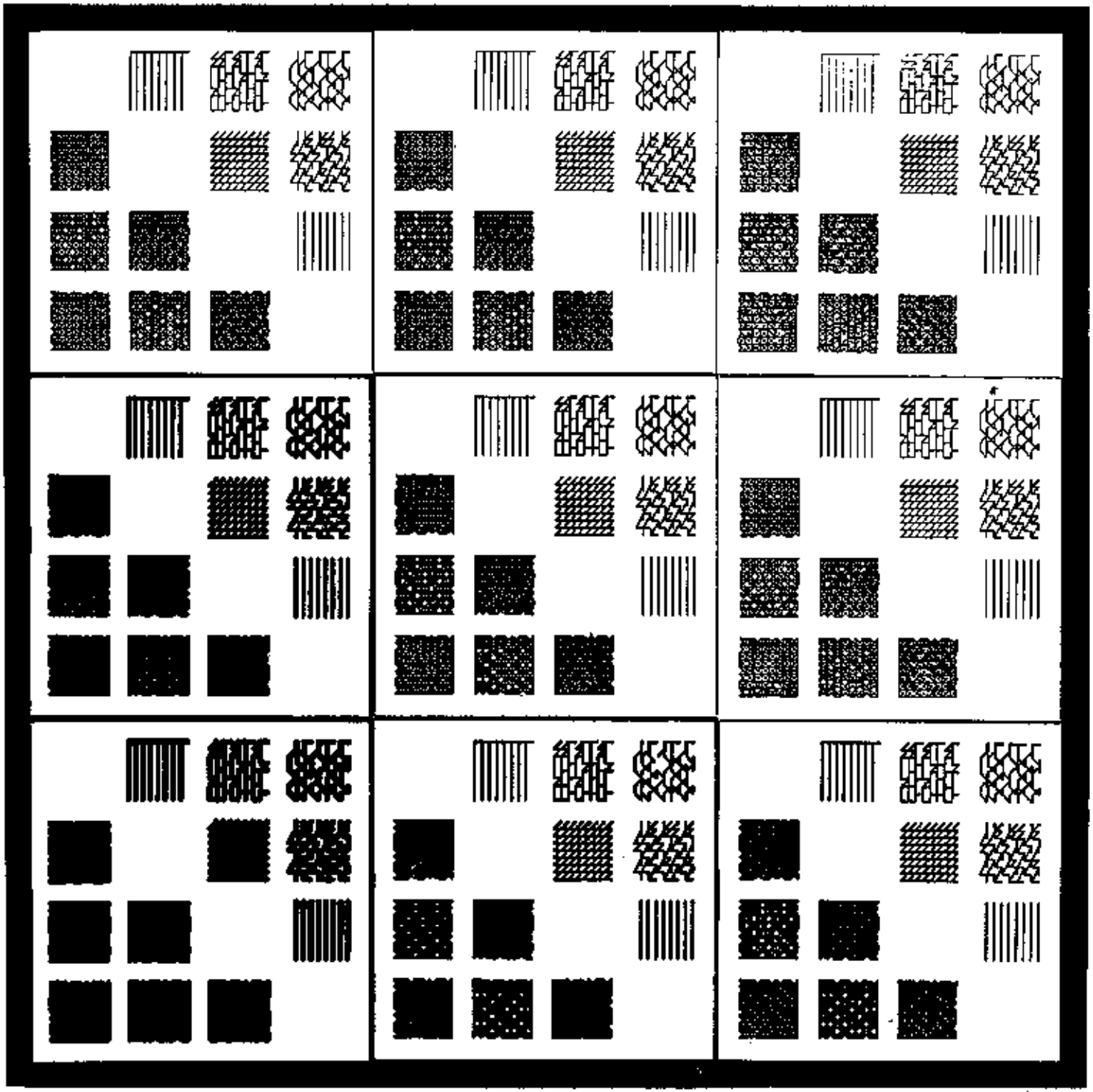
Line Direction

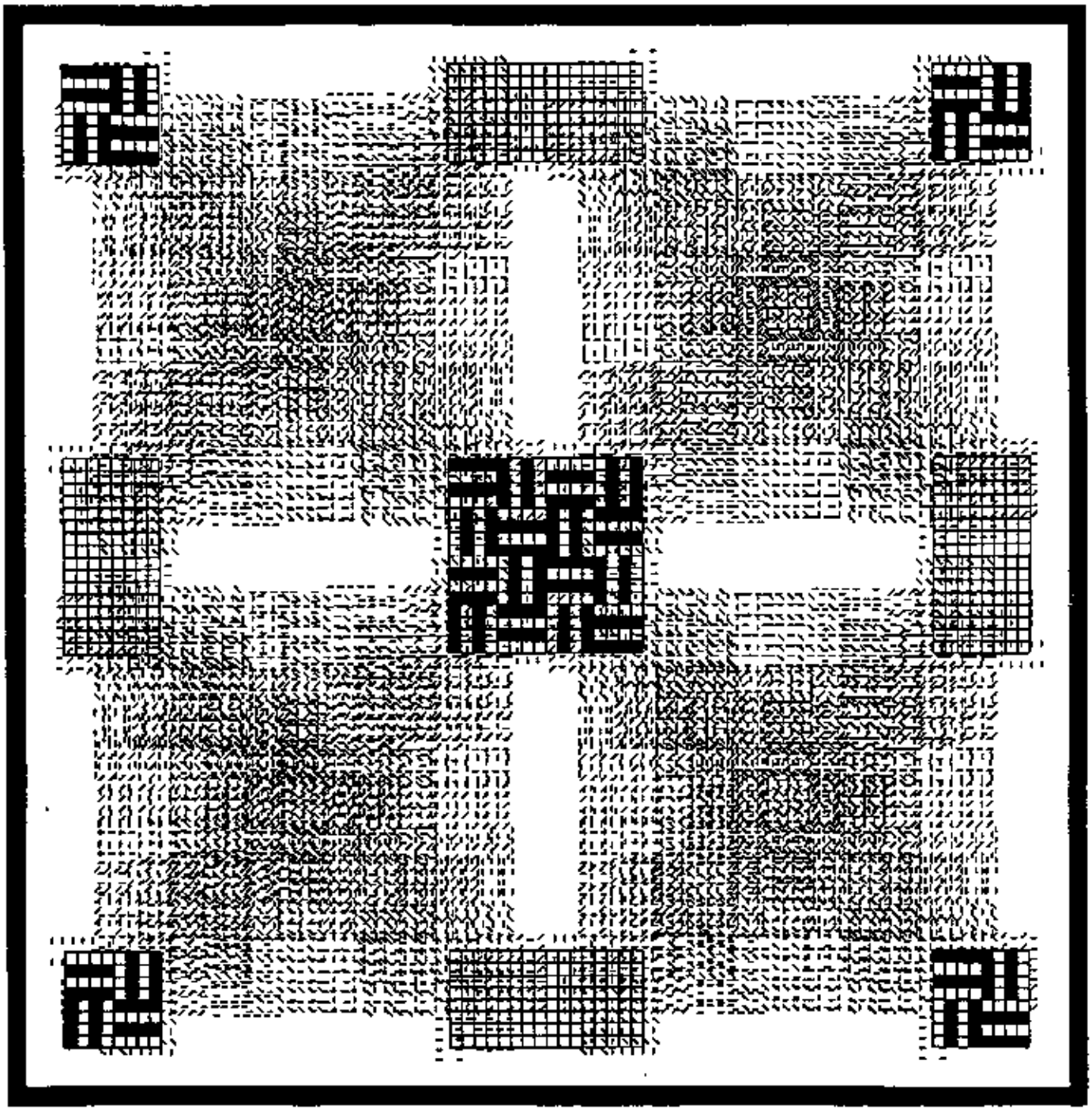


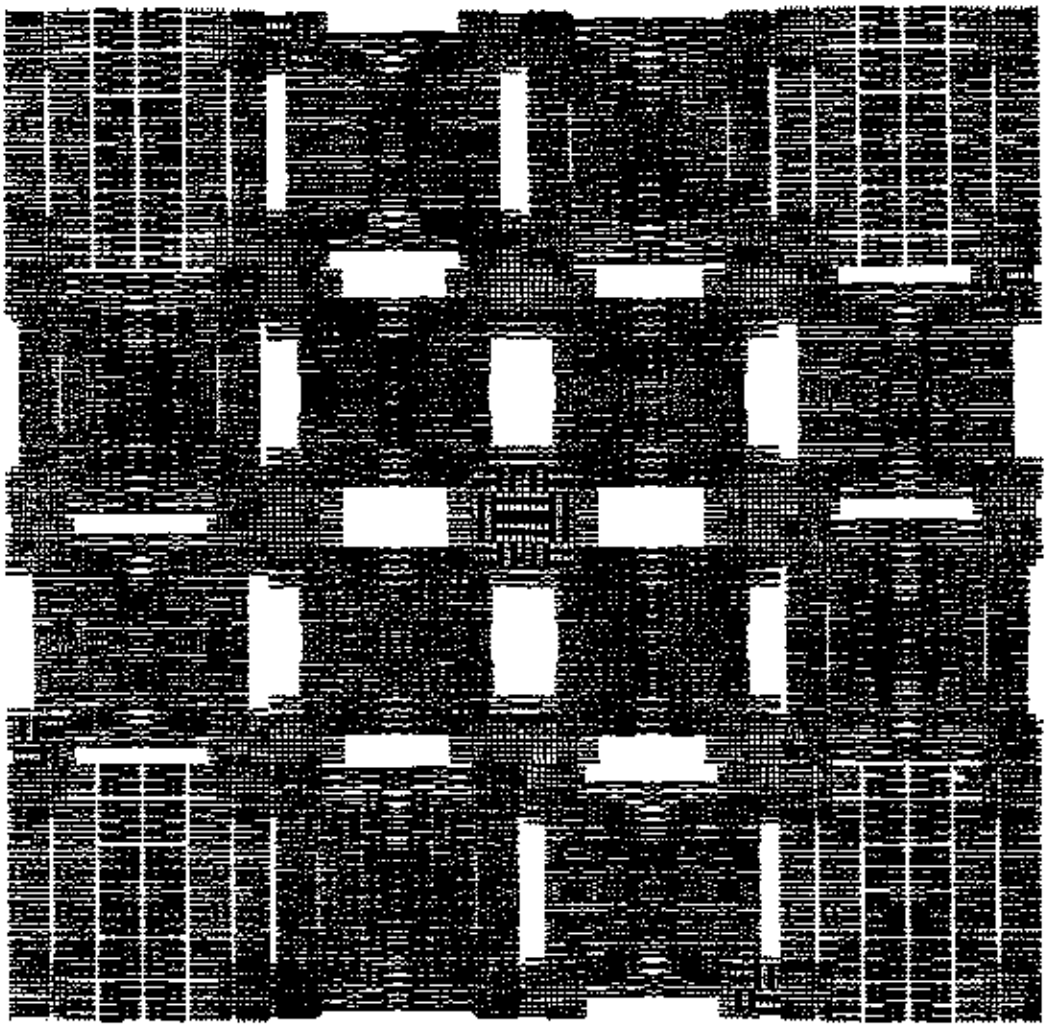
Connections

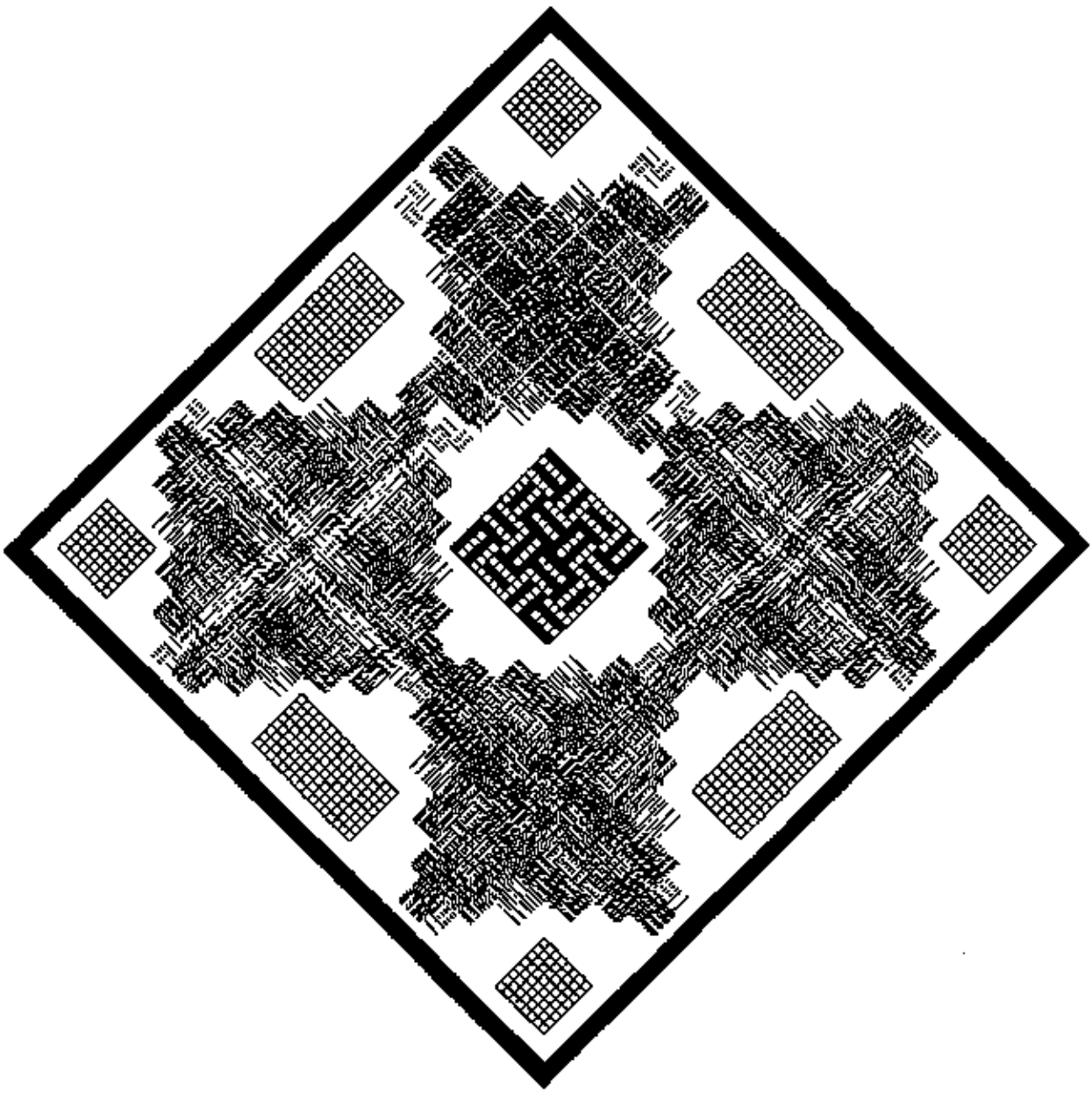


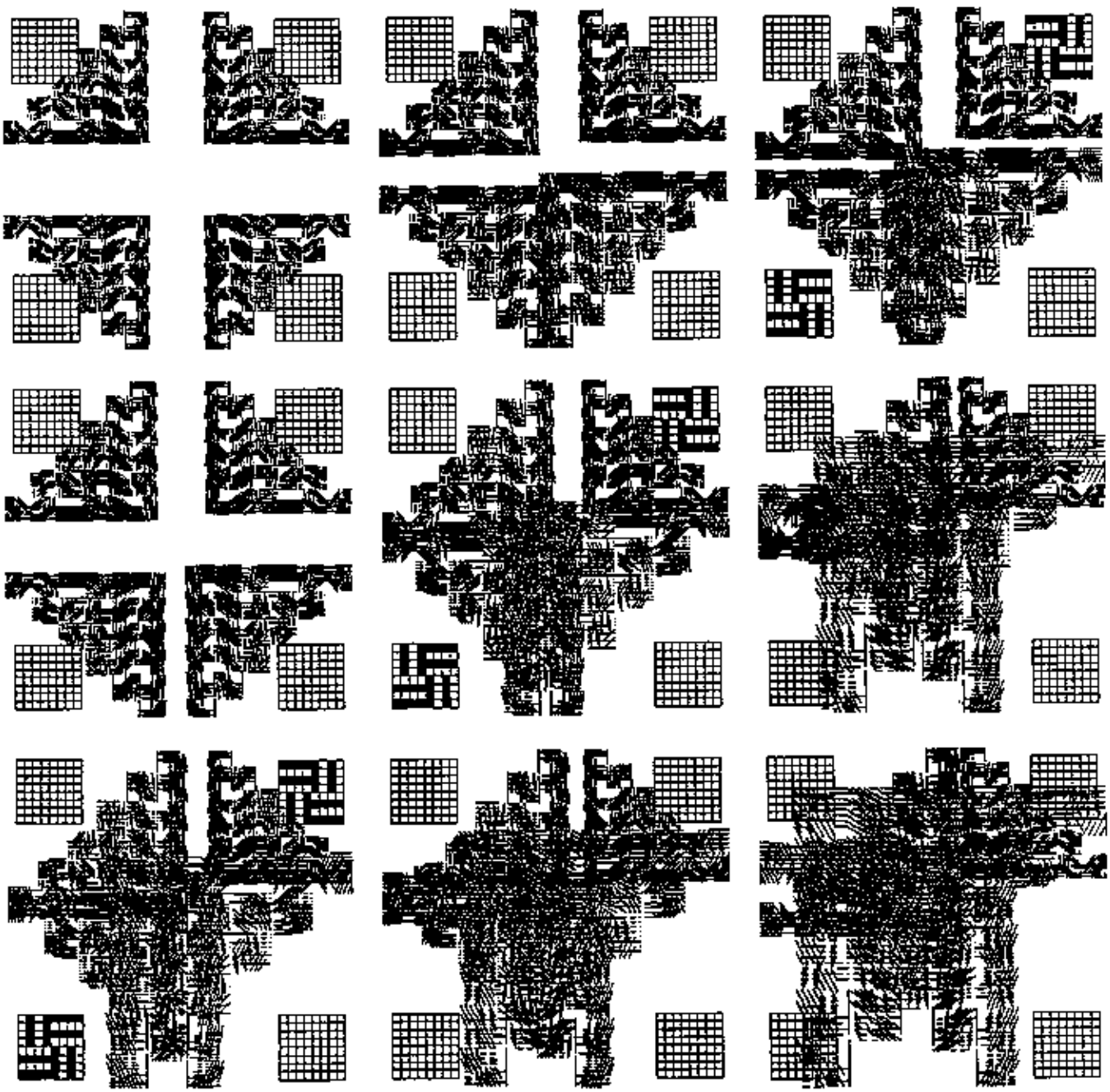

2
3
1
4











CHAPTER 4

TOWARDS A NEXUS OF IMAGE STRATEGIES

A PROBLEM

SOUND ⇒ IMAGE or IMAGE ⇒ SOUND

TRANSLATIONS DIFFICULT
DUE TO LACK OF IMAGE GENERATOR
(at that time)
(1976-78)

BUILD AN IMAGE
GENERATOR

WHAT IS AN IMAGE?

Trevor Batten

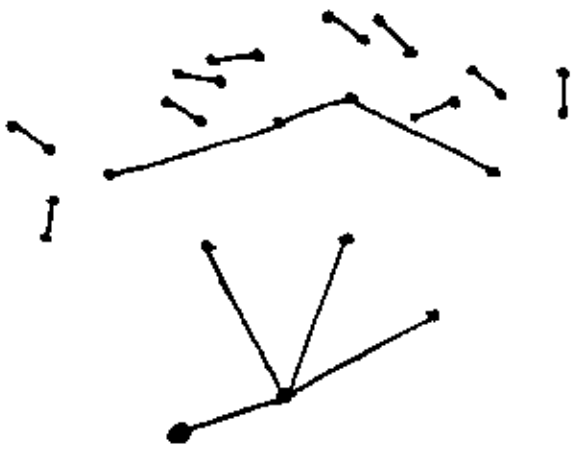
Arm Movements

In order to investigate the effects of translation in the visual creative process one needs a number visual languages to be available for inter-translation.

A first step in this process is a search for different ways of describing, generating and analysing images. In order to depart from the limitations of a mathematical approach in terms of X and Y co-ordinates a deliberate choice was made to approach the problem from the vieuw-point of an artist.

One such approach is that of the moveing arm. Although eventually the movement must be translated to X and Y co-ordinates (for the plotter) one thinks in the first place in terms of relative movements of the angles formed by the joints in the arm. The human arm also has a number of restrictions in the freedom of movement but the model is free to accept these restrictions or reject them.

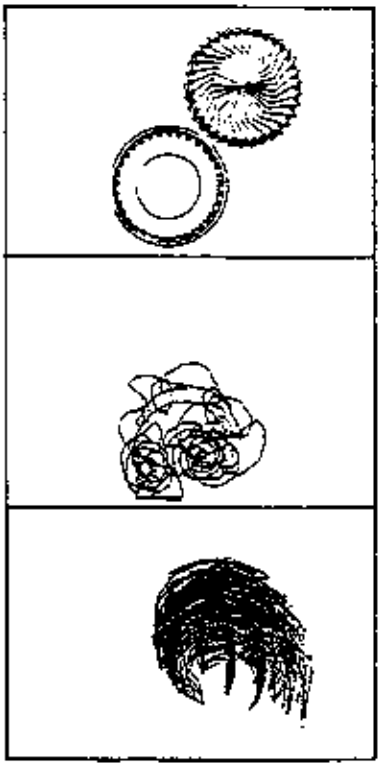
The information required to specify a complex drawing is less when specified in terms of relative arm movements than when specified in terms of X and Y co-ordinates. The visual complexity is not directly related to the conceptual complexity.

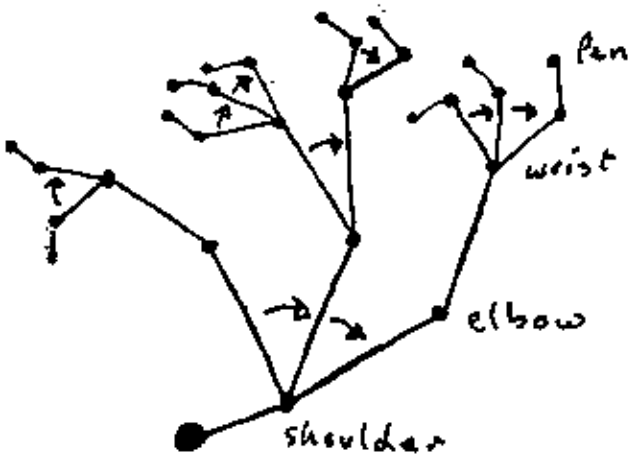


Movement (mixed)

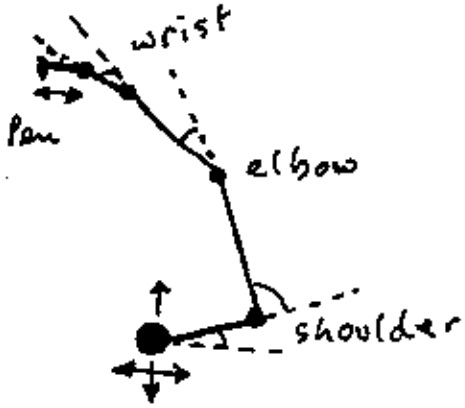
Trevor Batten

Arm Movement (1984/85)

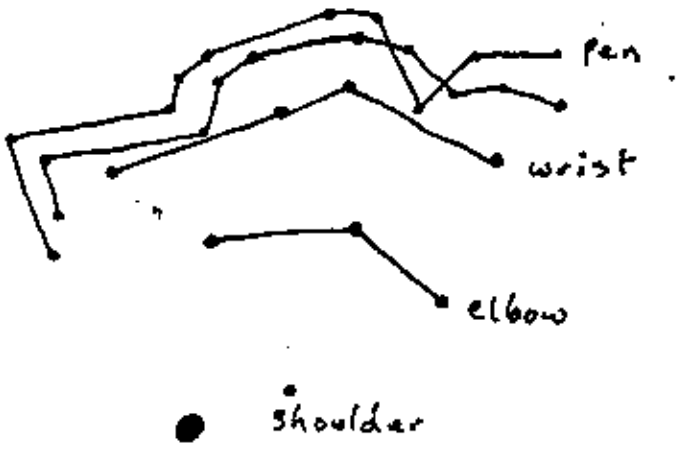




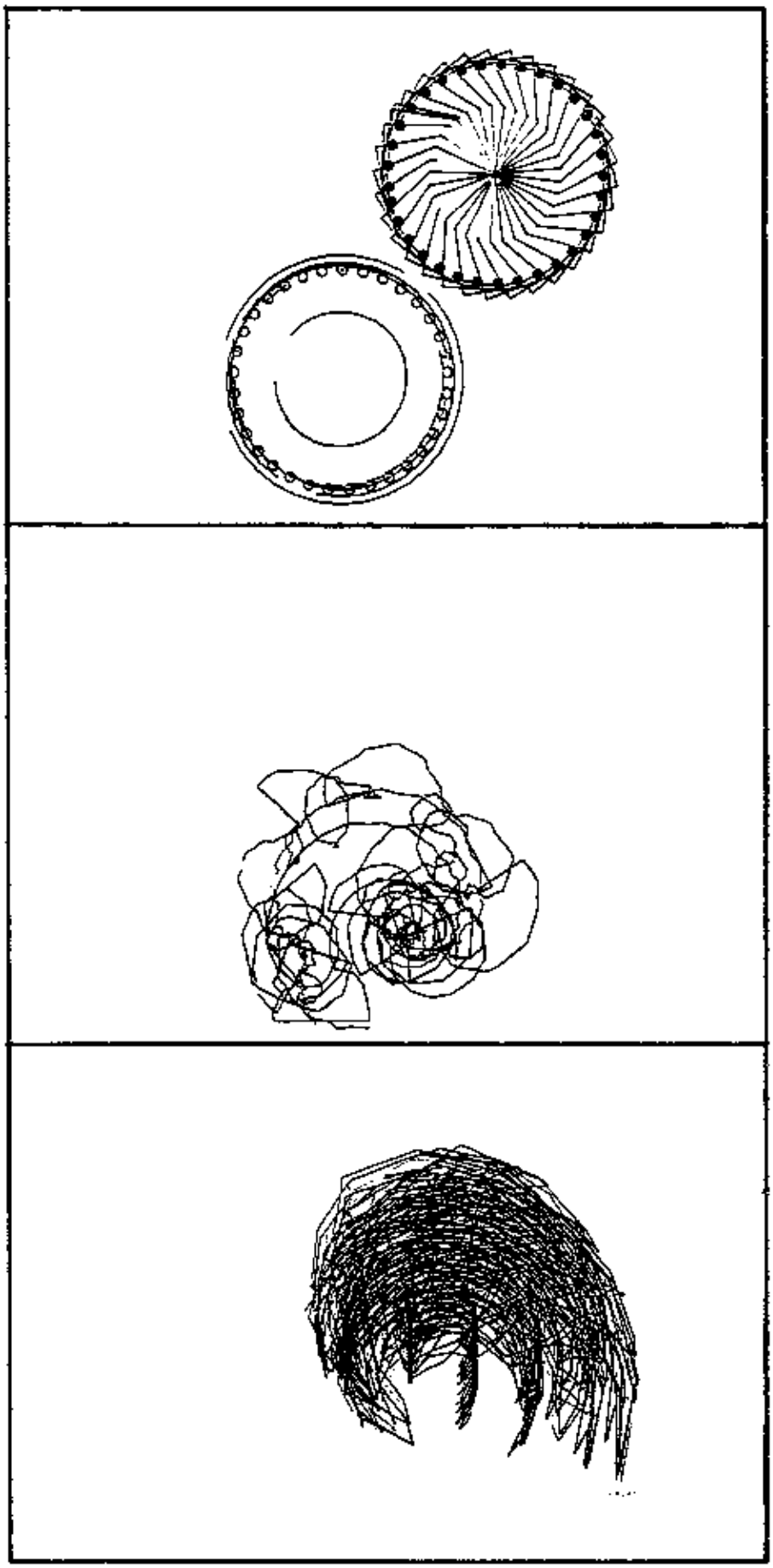
Movement (arm)

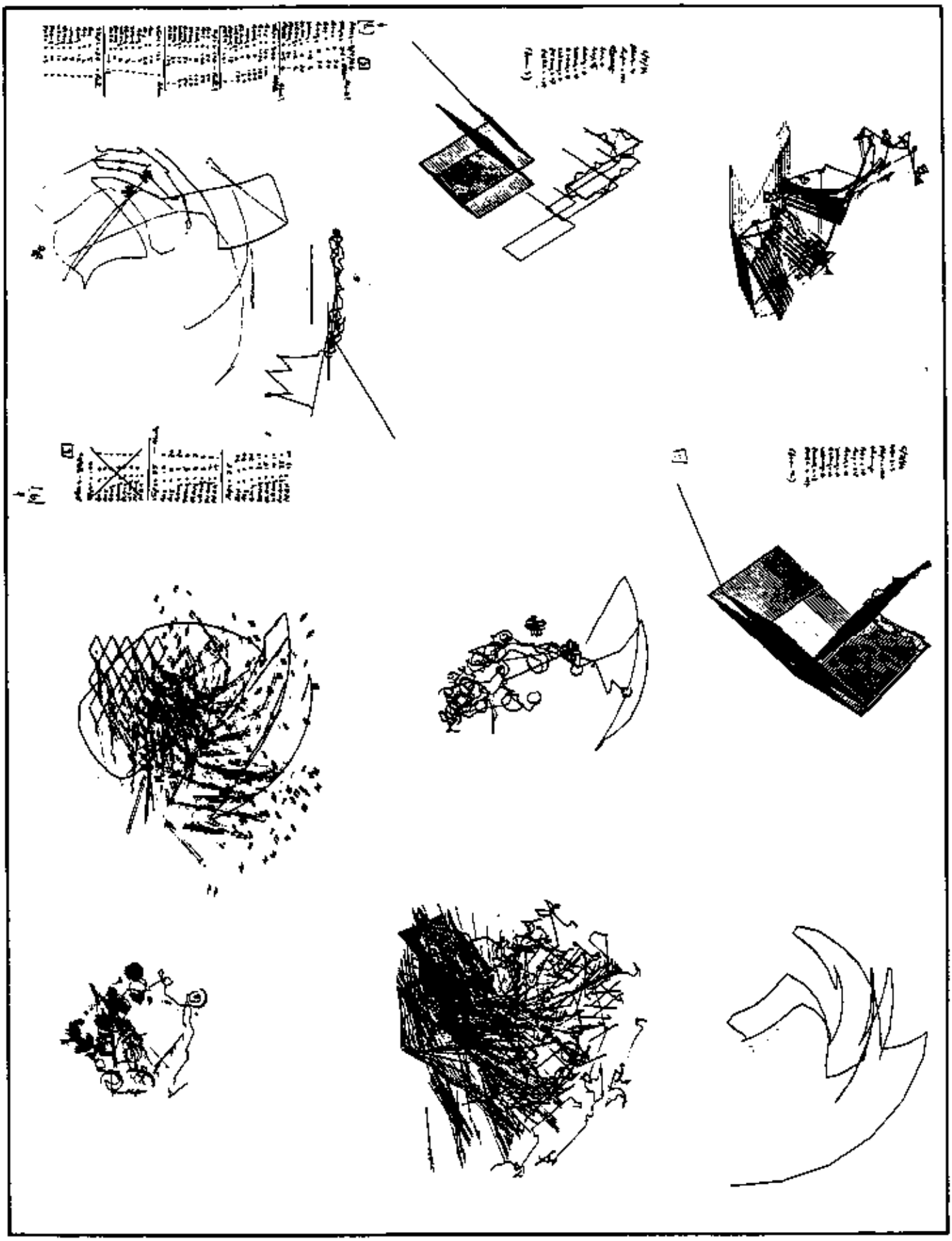


Basic System



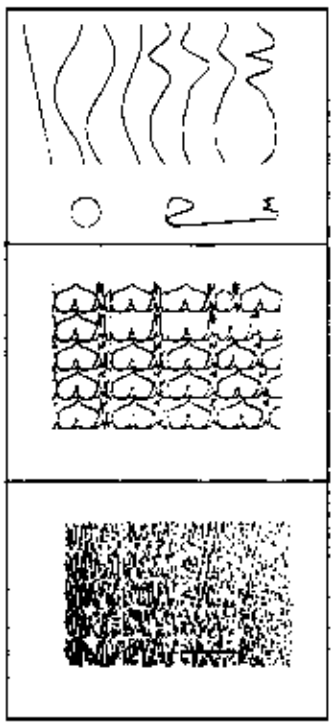
Movement (point)





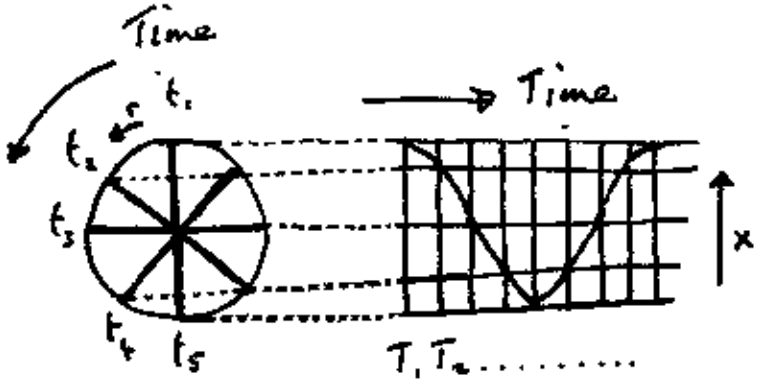
Trevor Batten

Scientific Tits (1985)

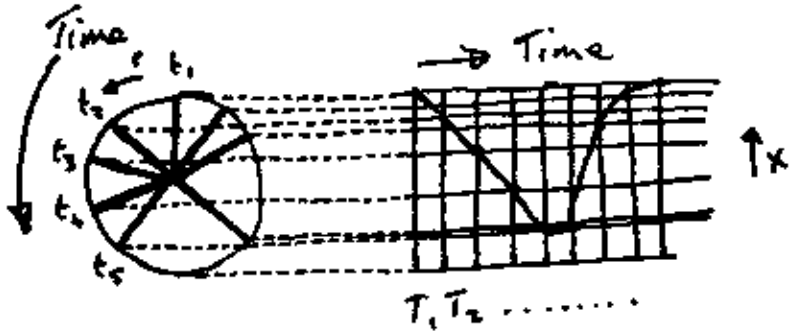


Translation Rotation & Vibration

$x = \sin(r)$



Regular Rotation

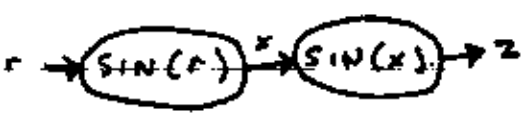


Irregular Rotation

By substituting x for r
(feedback) Irregular Rotations are generated

function

feedback



repeat

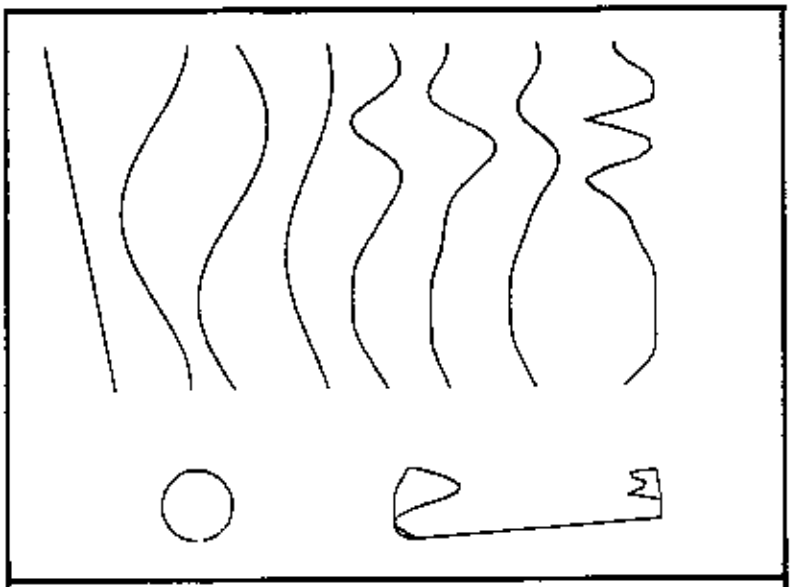
This drawing has a purely "scientific" origin.

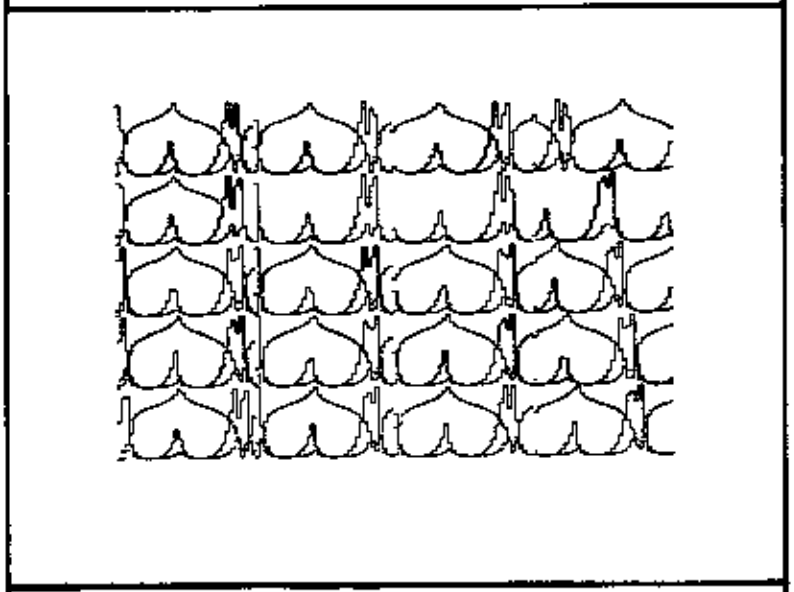
The arm movement studies described earlier were based on relative movements within a chain of connected circles. In practice, this meant that each "joint" has its own clock and a certain radial increment for every "tick" of that clock. For example, the wrist may move in steps of three degrees while the elbow moves in five degree steps -but only after the polse has moved twice. Angular movement can be between two extremes or a continuous circular movement.

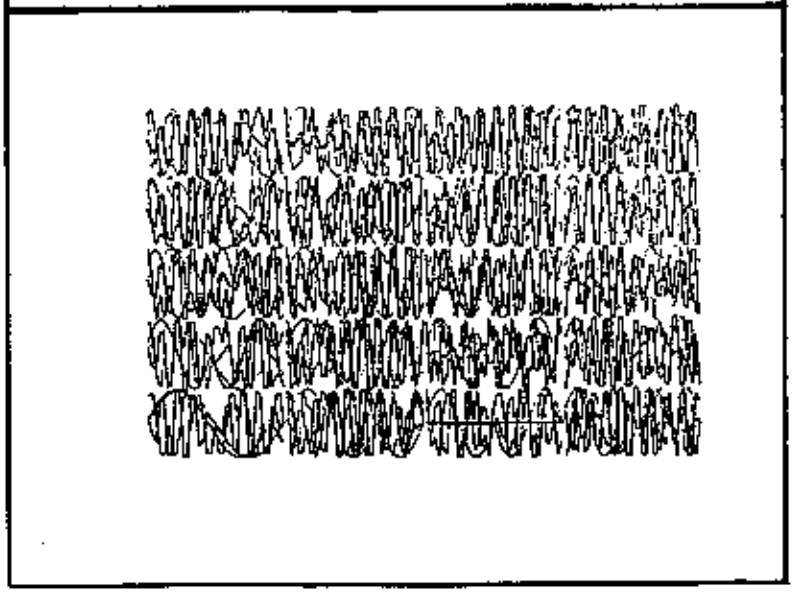
Such a system of movement is rather primitive and because the movements are not gradual the drawings can be rather jagged. The speed of change also remains constant in contrast to a real arm which is capable of subtle variations in speed.

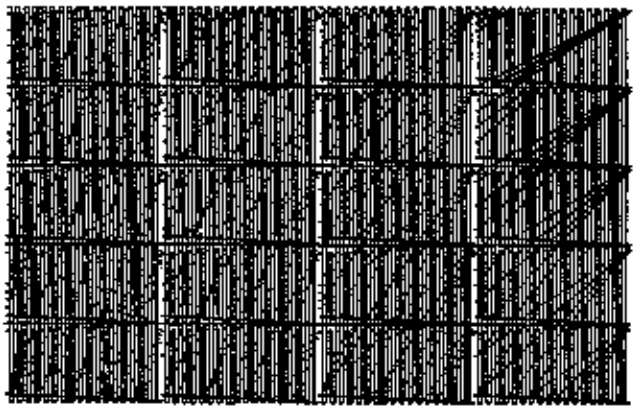
In order to make more complex movements one must make a conceptual machine capable of generating a series of values exhibiting interesting patterns of variation within the series. These data can then be used to control the arm movements.

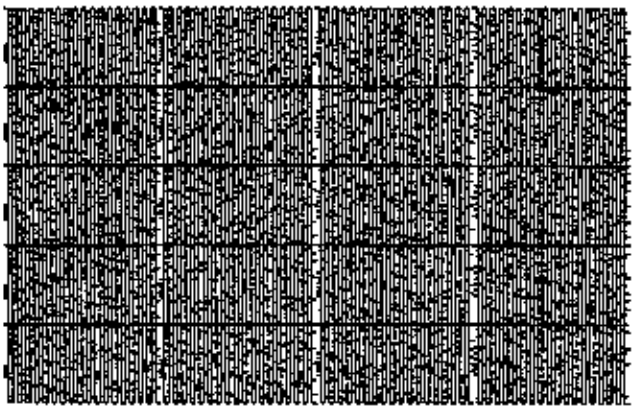
Certainly for an artist, mathematical patterns are easier to find when the information is presented visually. The original function of the elements of this drawing was to make these patterns visable in order to test the machine generating them. Despite the "scientific" origin certain associations do seem to be generated.

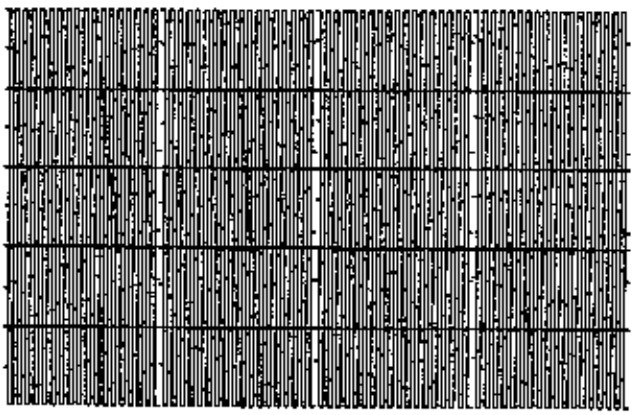


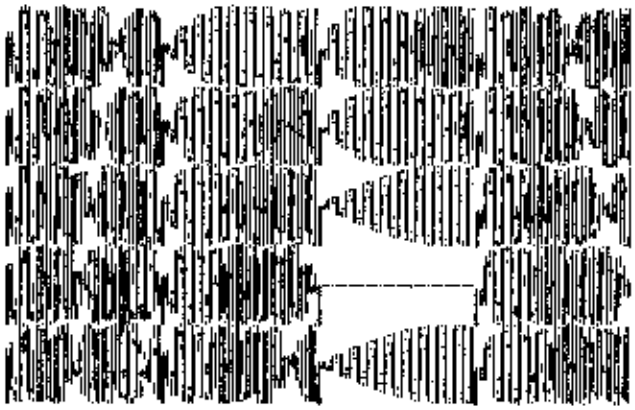


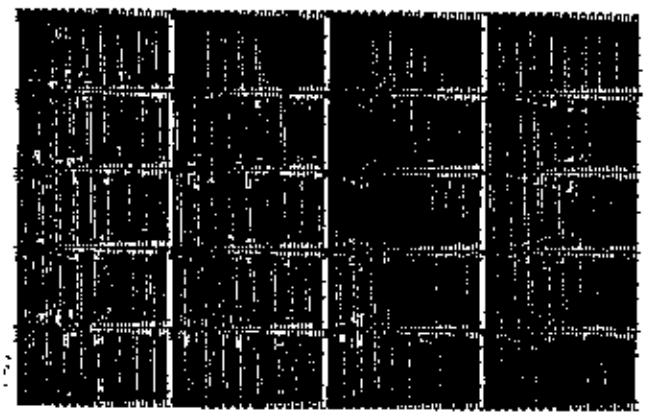


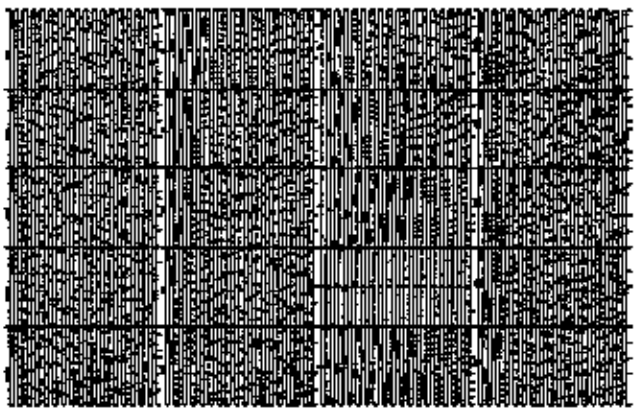












Metapraktica

Without order there is chaos

Ordered actions (or events) form a system
The totality of a system forms a space

The world is multi-dimensional

By seperating the dimensions we generate a
set of interrelated spaces

every sense organ
every medium
every language
every system
defines its own space

An action may occur in one space
and the result experienced in another

The task of science and art is to search
for the interrelations between the spaces

Thus can we understand our world
by transforming chaos into images

The images do not (cannot) always correspond
to reality

The more control we have over our images
The more control we have over our world

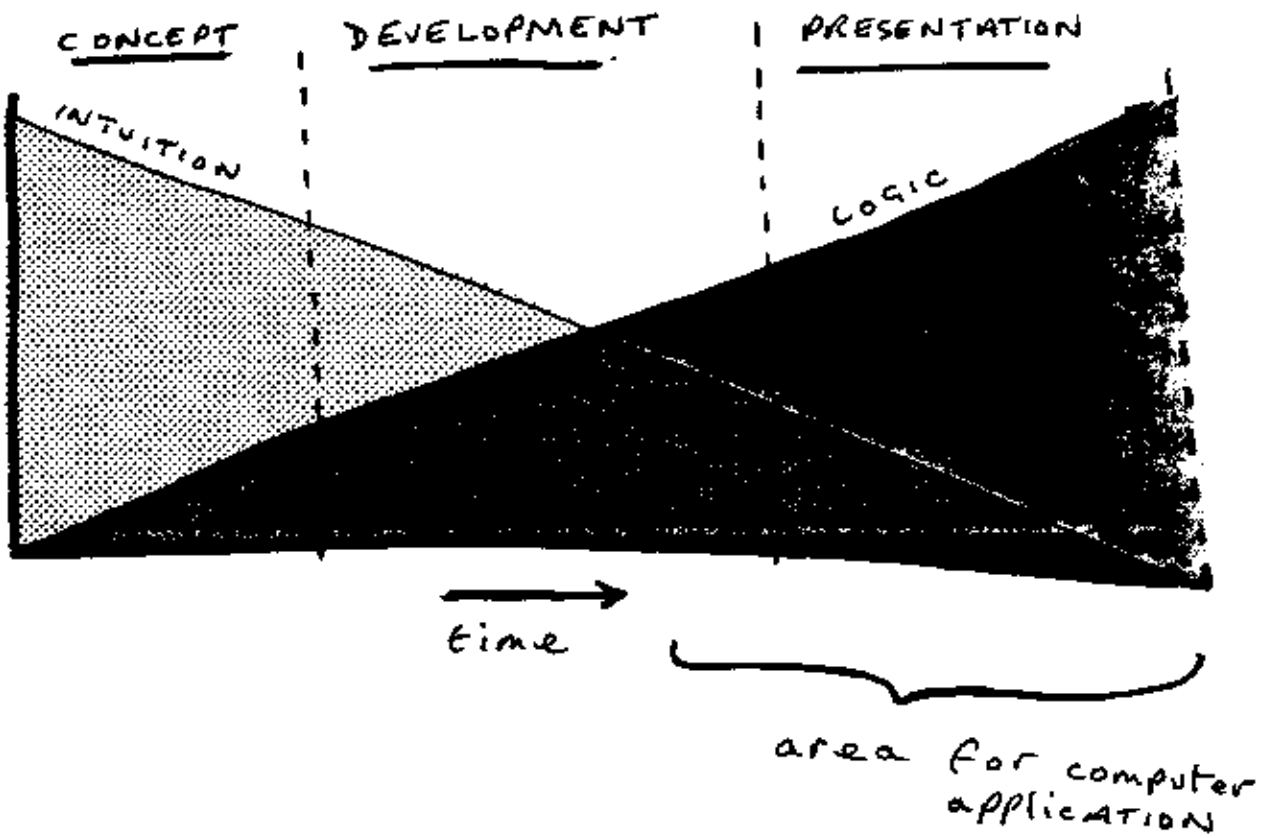
CHAPTER 5

PRACTICE TRANSLATED INTO THEORY

(Ontological Generation within a
Nexus of Translations)

USE OF THE COMPUTER IN THE DESIGN PROCESS

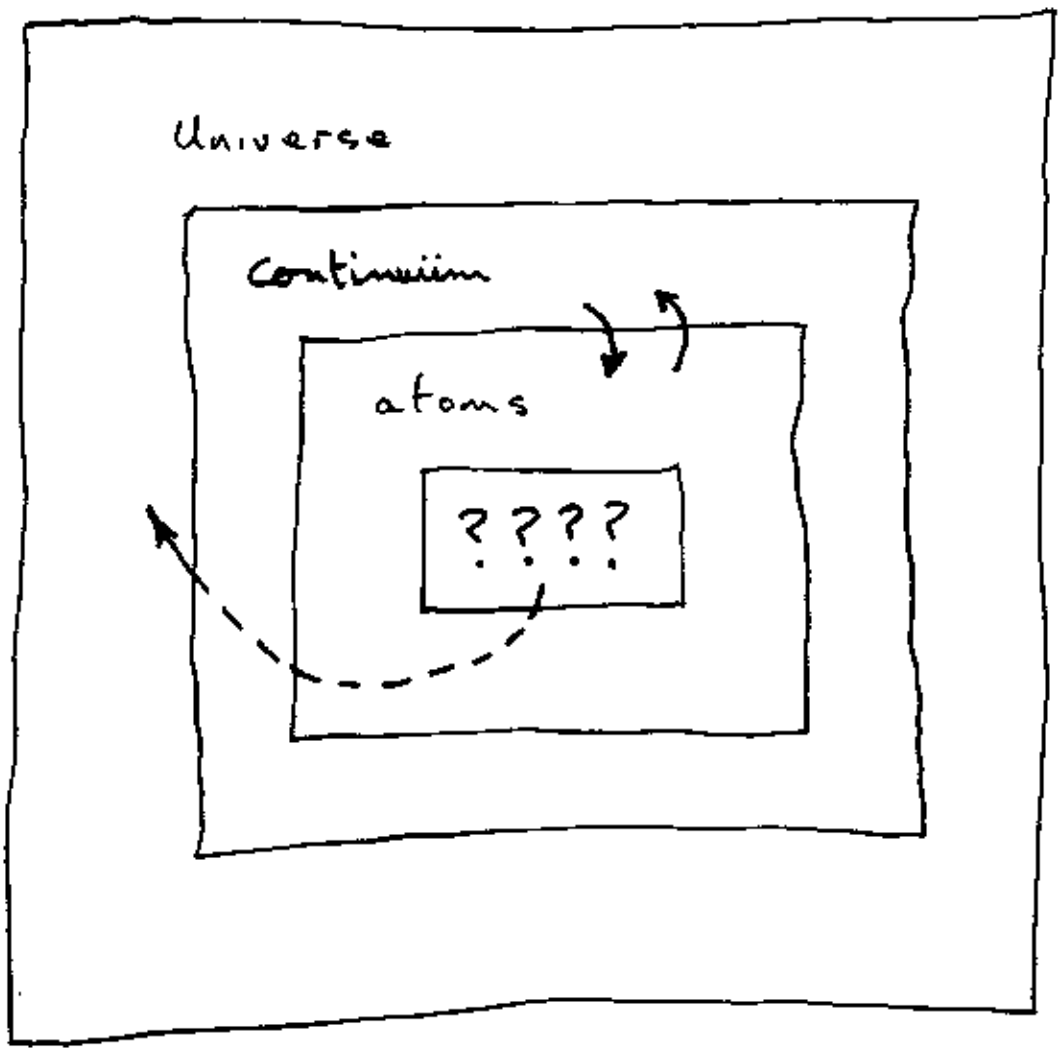
(after v.d. Toorn Vrijthoff)
- Total Design



NOTE: OPPOSITION LOGIC AND INTUITION.

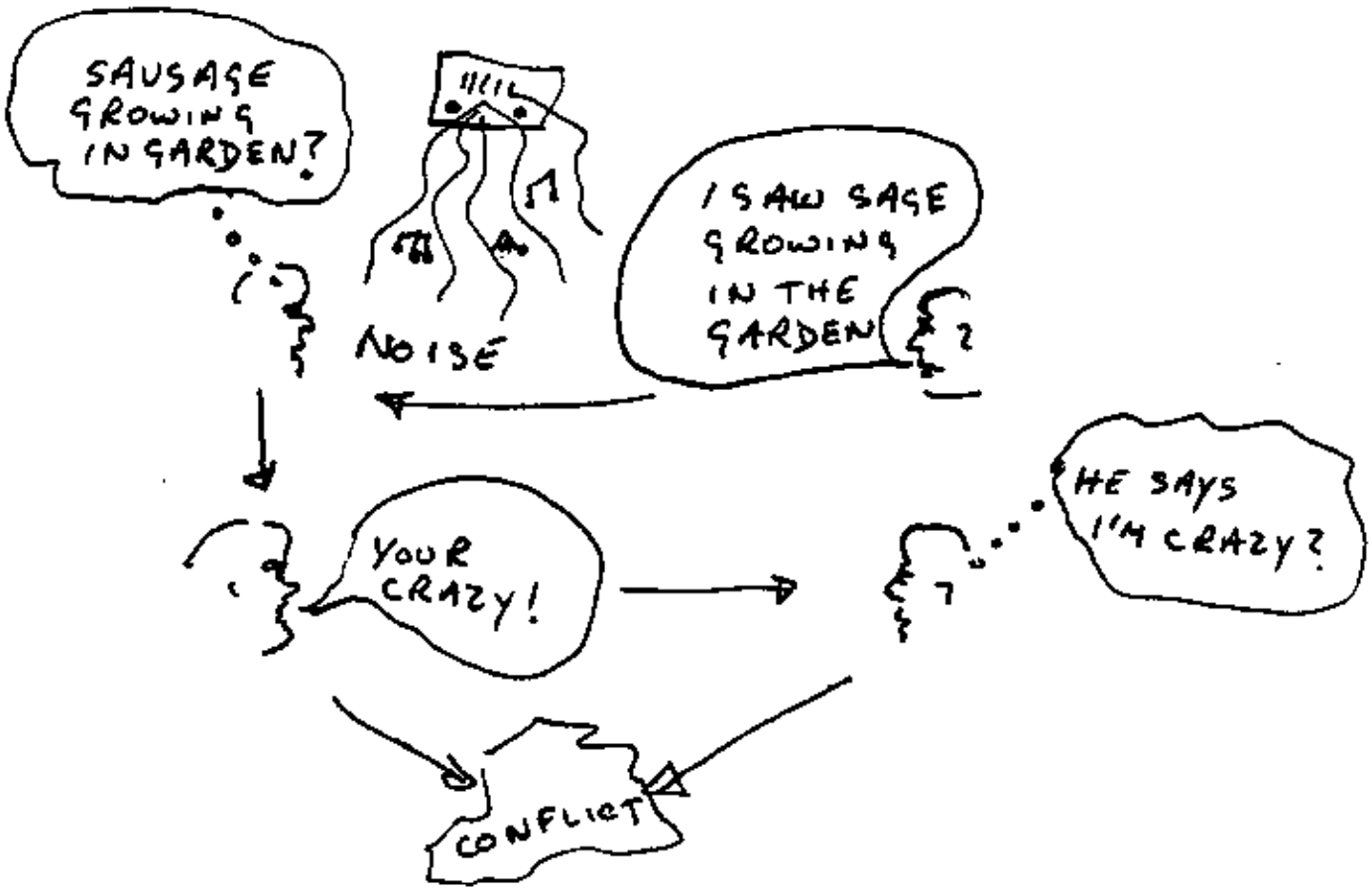
PERCEPTUAL LEVELS IN PHYSICS

(Naar Prof. C. Hirsch)



Note: Problem reduced
to
relationships between
descriptions

NOISE AS A CREATIVE MEDIUM

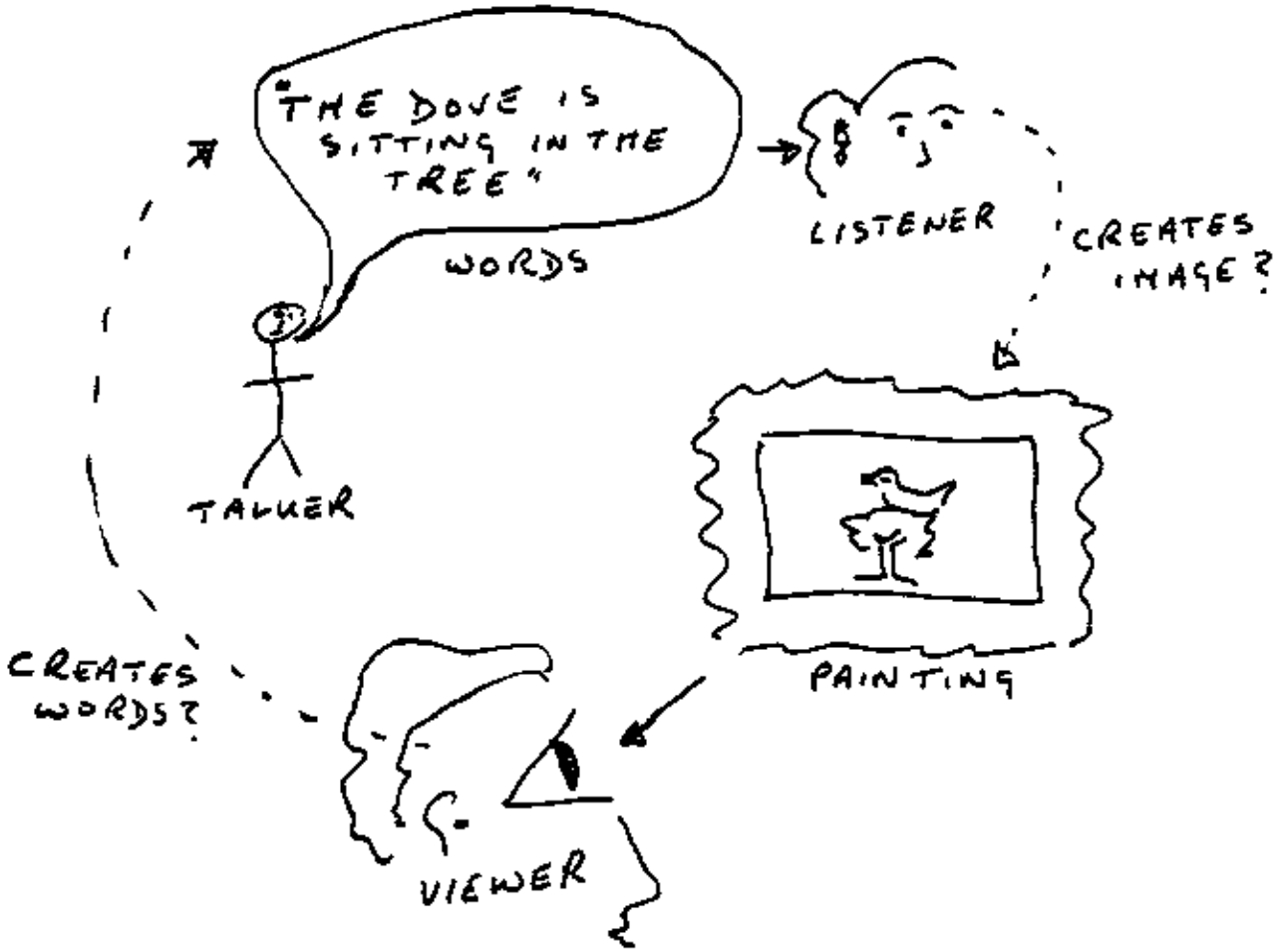


DISTORTION IN COMMUNICATION IS BOTH CREATIVE (NEW MESSAGE) AND DESTRUCTIVE (MESSAGE CONFUSED)

ART ENCOURAGES NOISE

SCIENCE DISCOURAGES NOISE.

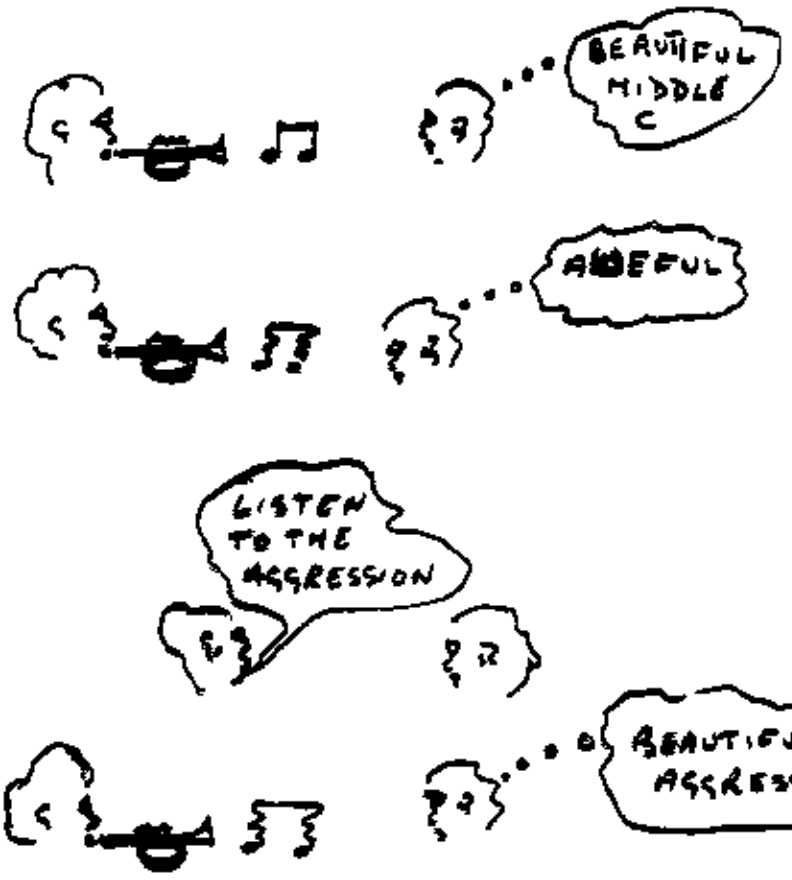
WHAT IS THE LANGUAGE OF THE MIND?



When I hear the words do I ~~create~~ imagine the image?
When I see the picture do I image the words?

Are my thoughts words
images
neither
both ?

PERCEPT / CONCEPT REVISITED



PERCEPTION IS BASED ON CONCEPTION

{ you hear wat your listening for
you don't hear wat your listening for
you don't hear wat your not listening for }

∴ ..... when do you hear what your not listening for?

a conflict with your expectations.
a violent change

BUT WHERE DO THE CONCEPTS COME FROM?

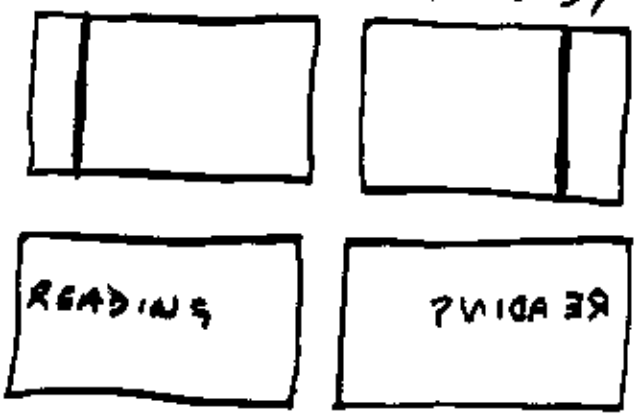
FROM GOD ?

FROM PERCIEVED EXPERIENCE ?

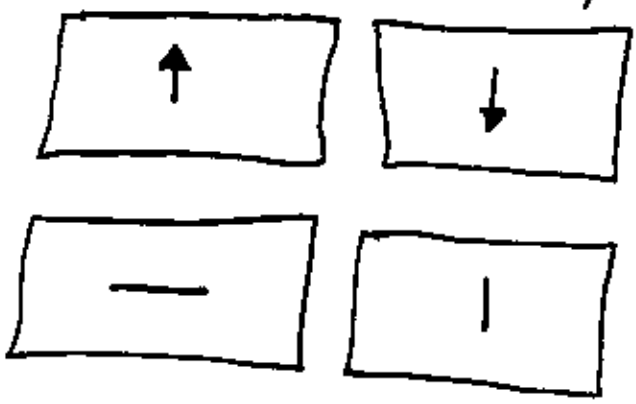
PERCEPT ⇄ CONCEPT

THE MULTI-SENSORY NATURE OF VISION

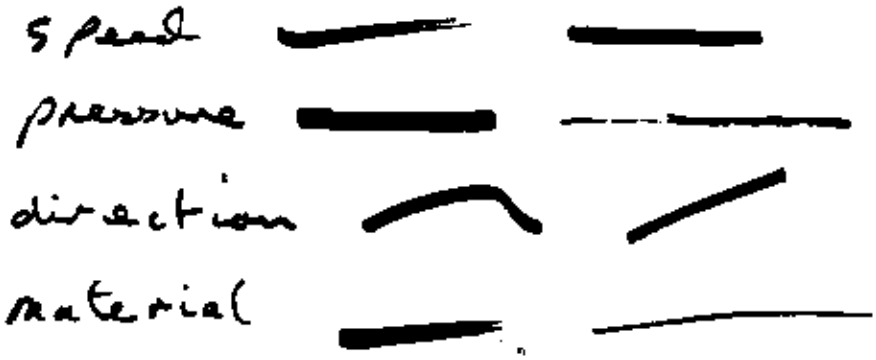
ASSYMETRY OF HUMAN BODY



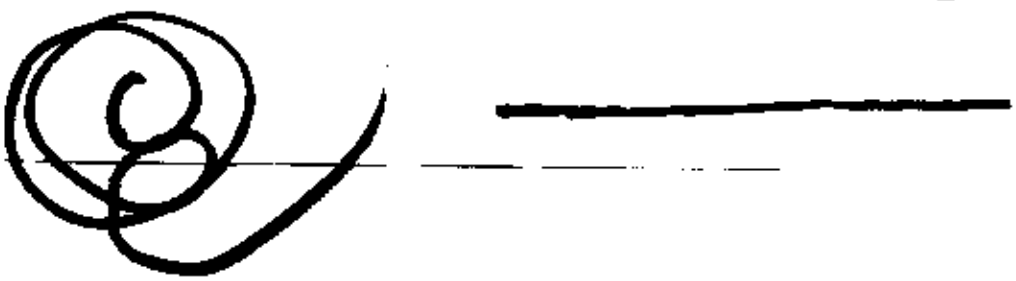
ASSYMETRY OF GRAVITY



THE RECORD OF A MOVING OBJECT IN CONTACT WITH THE PAPER:



Natural and unnatural body movements
(natural radii of the human drawing machine)

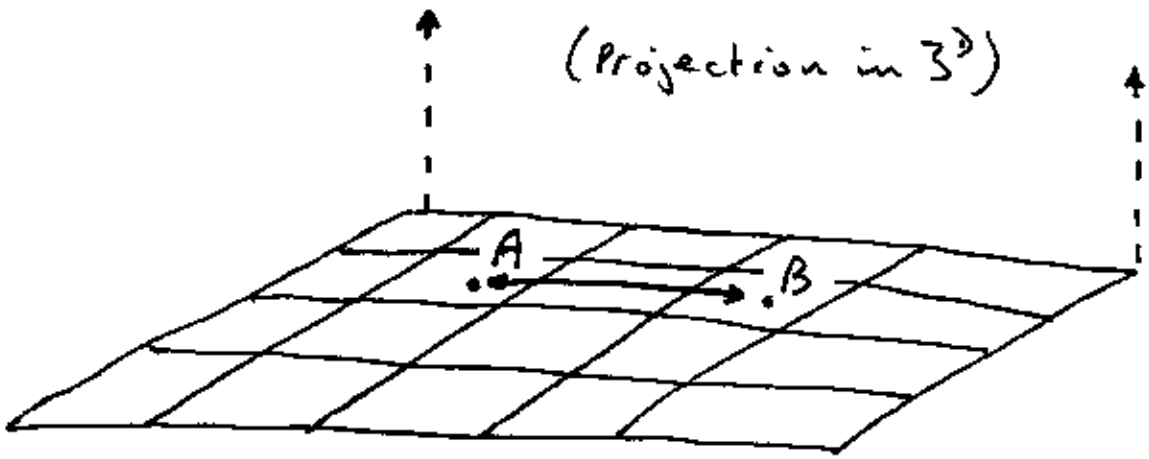


THE MULTI MEDIA NATURE OF MUSIC

EVERY ACTION REFLECTS A STATE OF MIND
EVERY SOUND REFLECTS AN ACTION

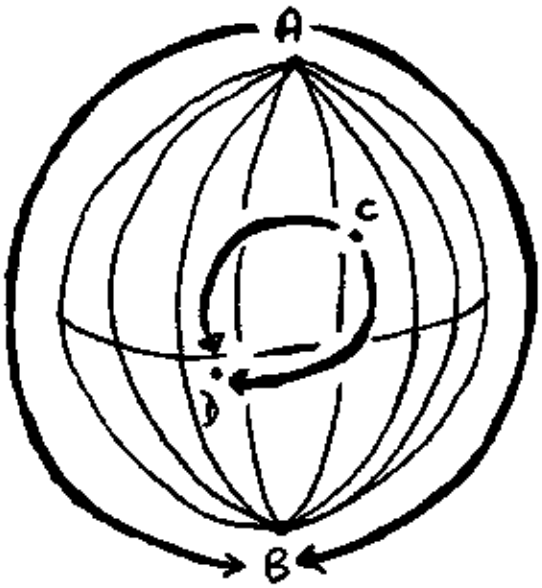
THE ENERGY OF ITS EXISTATION
IS ENASTICITY
THE VOLUME OF THE VIBRATING MASS

GEO-METRY



One Line AB

EUCLID
- Flat
- Homogenous
- Theoretical



infinite no. of lines AB
2 lines CD

NON EUCLID
- Curved (?)
- not Homogenous
- Pragmatic

Discovered aprox. 1833
Thought to be exceptionally BIZAR!

By concidering NON EUCLIDIAN SPACES as
CURVES IN EUCLIDIAN SPACE
EUCLID IS PERPETUATED AS OBSECTIVE REALITY!

THE TRIUMPH OF EUCLID!

(after Buckminster Fuller)

NOISE IS RANDOM —

IS THE DISTORTION RANDOM?

No! – THE GEOMETRY OF EACH
MEDIUM IS DIFFERENT.

TRANSLATION CAUSES DISTORTION

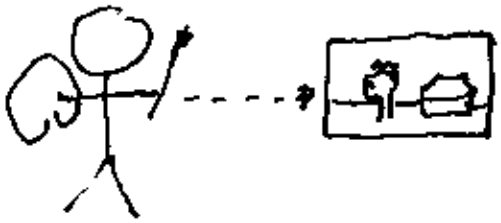
– THE INTERACTIONS BETWEEN
THE GEOMETRIES
GENERATE
NEW OBJECTS

CHAPTER 6

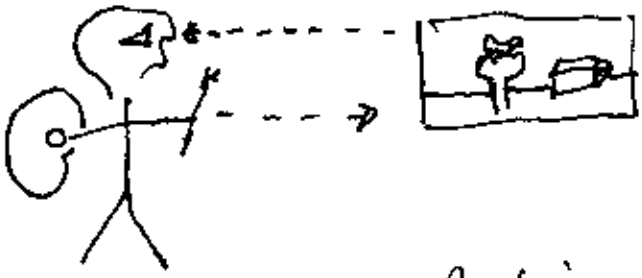
TOWARDS A PRACTICAL PEDAGOGY

ART

EXPRESSION



DIALOGUE



Art is not Expression !

The Art
is to build a conceptual machine
That
Can Facilitate
The Dialogue

Axioms

a PATTERN is

a collection of relations
between objects

a SYSTEM is

a dynamic pattern

a rule implies a pattern
a pattern implies a rule

HUMAN BEHAIVIOUR is

reducable to
a rule-bound
manipulation of patterns

- -pattern making
- -pattern recognition
- -pattern transformation

ART in principle
SCIENCE in general
MATHEMATICS in particular

are systems
for manipulation
of patterns

the COMPUTER

is a machine for manipulating
existing or non-existing
patterns

the PATTERN derivable
from an OBJECT

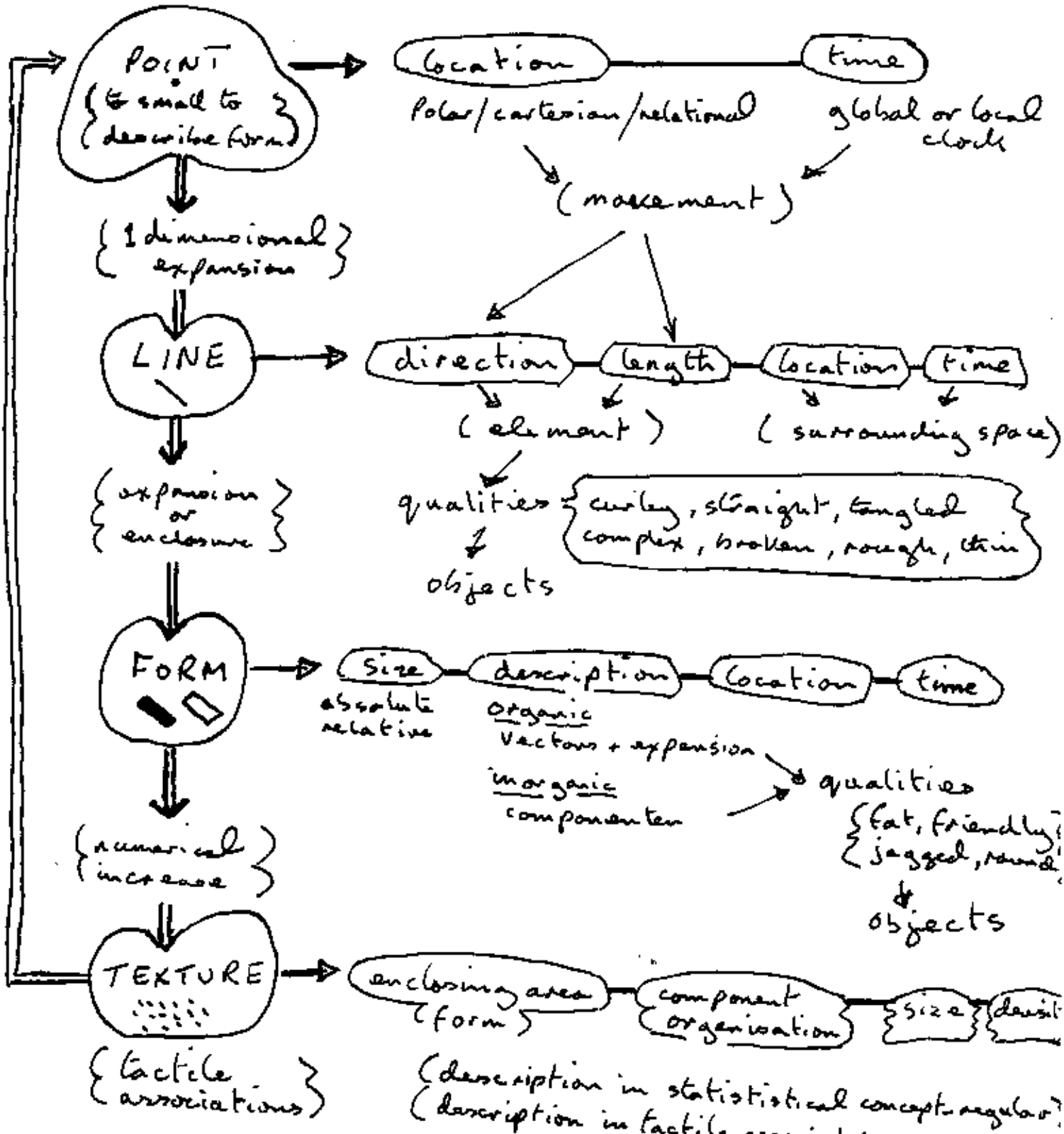
is dependant on
the DESCRIPTION
of that OBJECT

by OBJECT is
also SYSTEM understood

Patten
86.

A Possible Visual Description Language Nexus

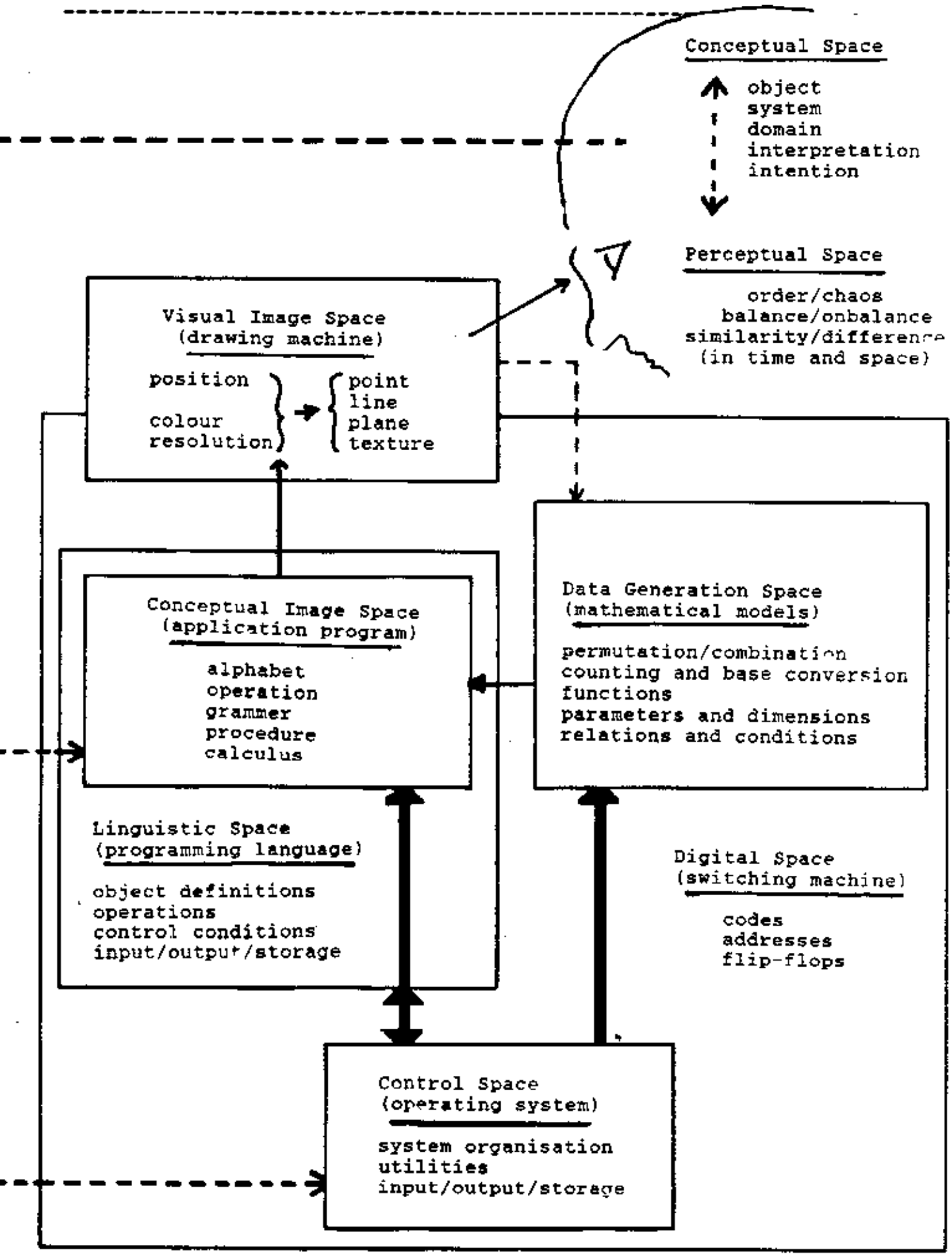
(perceptual abstract - based on Paul Klee)



{Also clues to establish mappings to other domains
i.e. sense organs - for example speed of brushstroke}

Trevor Batten

Artist and Computer



A Linguistic Sketch of a Visual Nexus

WARNING!

AN INTELIGENT COMPUTER
MAY BE POSSIBLE.

IT MAY BE

JUST AS

NEUROTIC

PIG HEADED

SELFISH

AND

UNCONTROLABLE

(ununderstandable and devious)

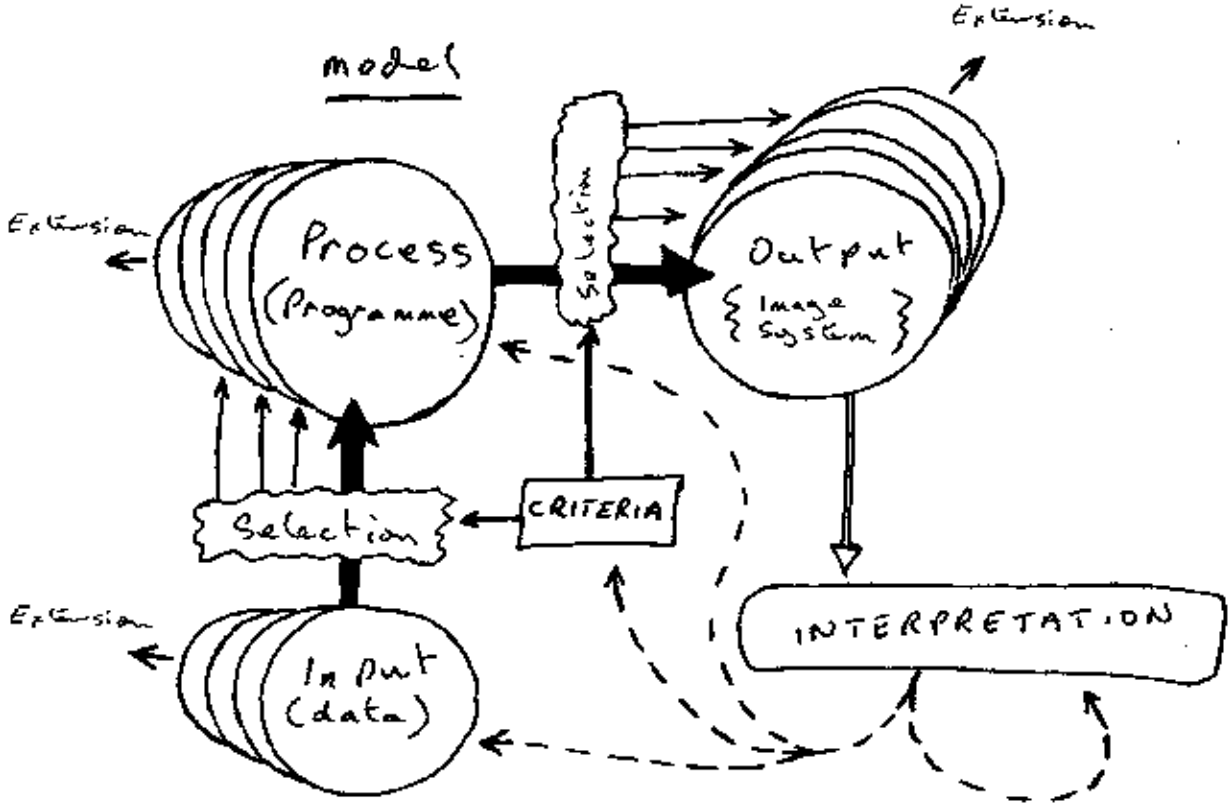
AS HUMAN INTELIGENCE

- IT MAY NEED TO BE
AS PART OF ITS NATURE

INTELIGENCE IS DANGEROUS
STOPIDITY IS DANGEROUS

LIVING MAY BE BAD FOR YOUR HEALTH!

STRATEGY for a DIALOGUE



Strategy

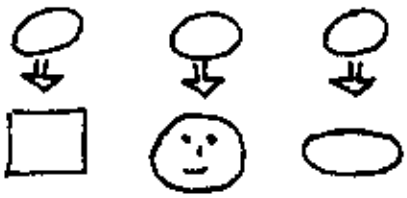
Syntactic

What happens when
- programme changed
- data changed

Semantic

"Interpretation" puts image in context

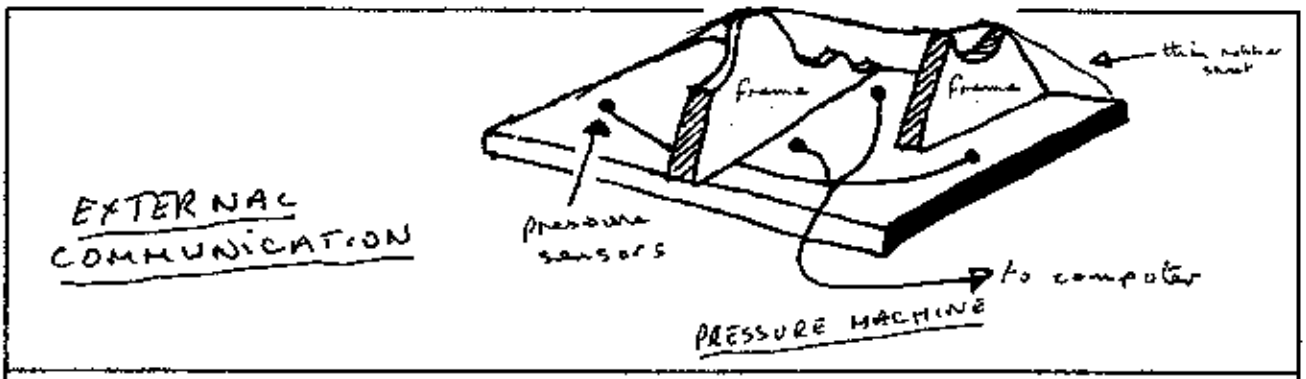
for example:



can programme do this?

YES ⇒ what data?

NO ⇒ what changes needed?


EXTERNAL COMMUNICATION
thin rubber sheet
frame
frame
pressure sensors
to computer
PRESSURE MACHINE

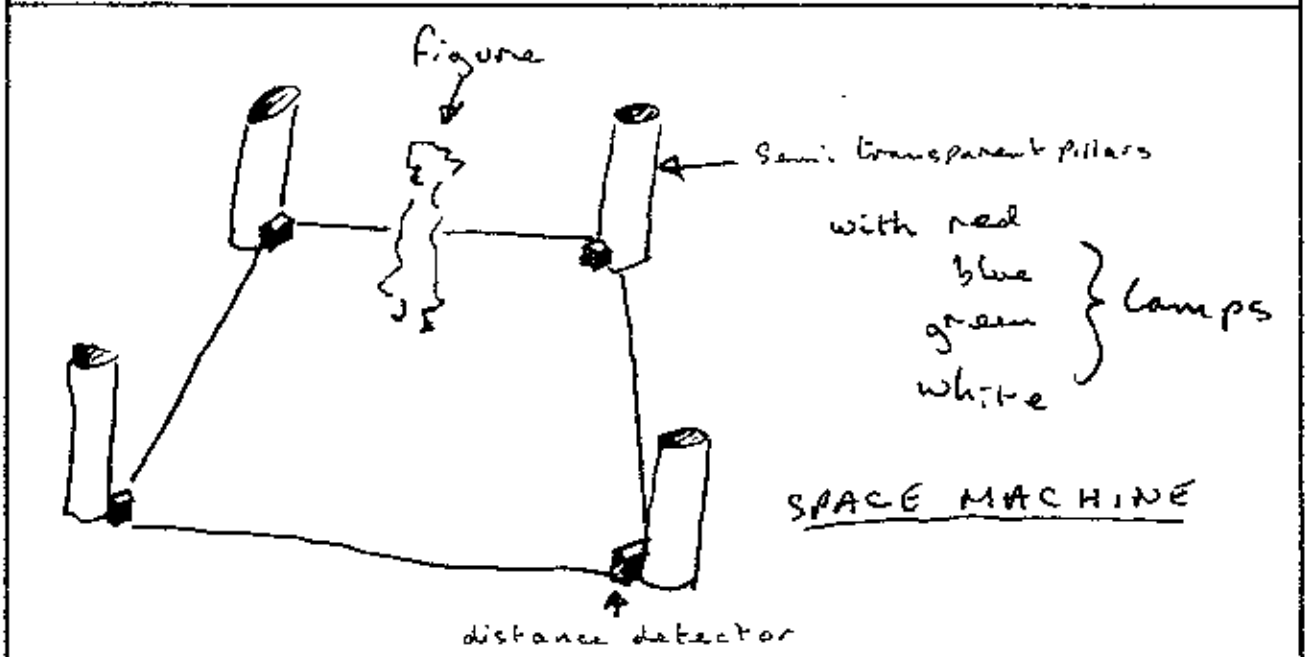
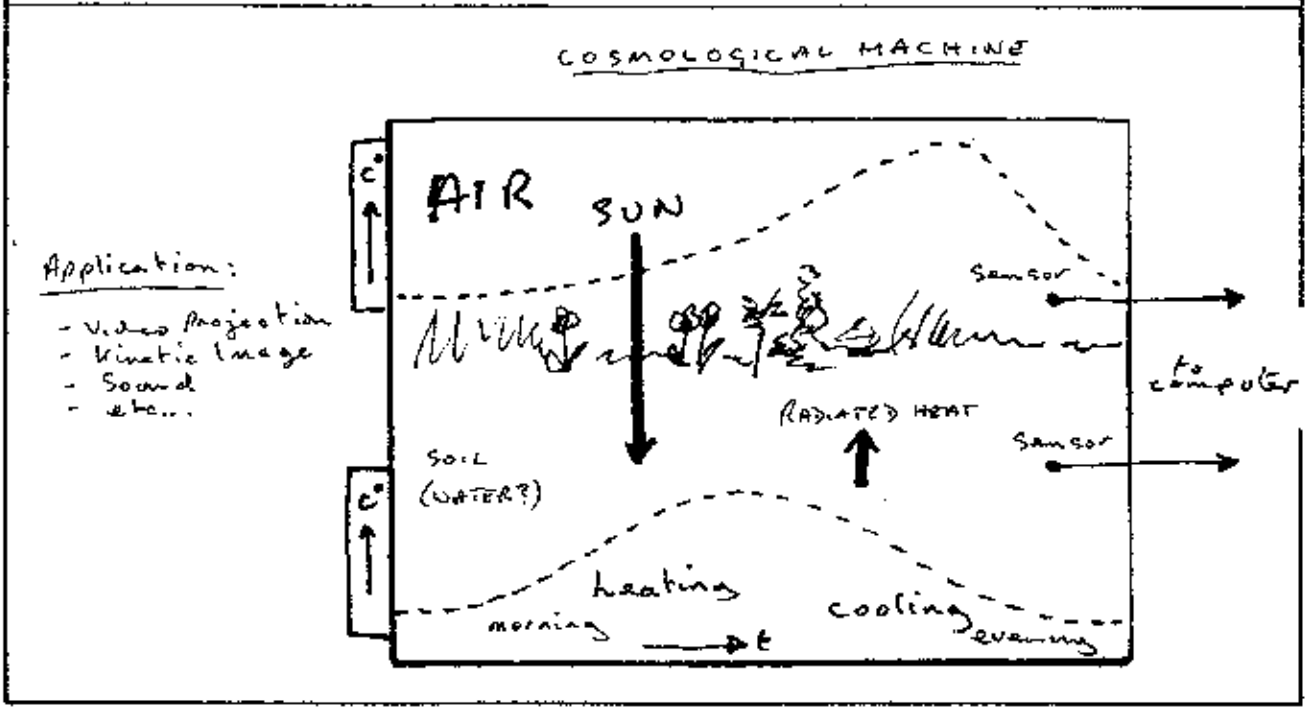
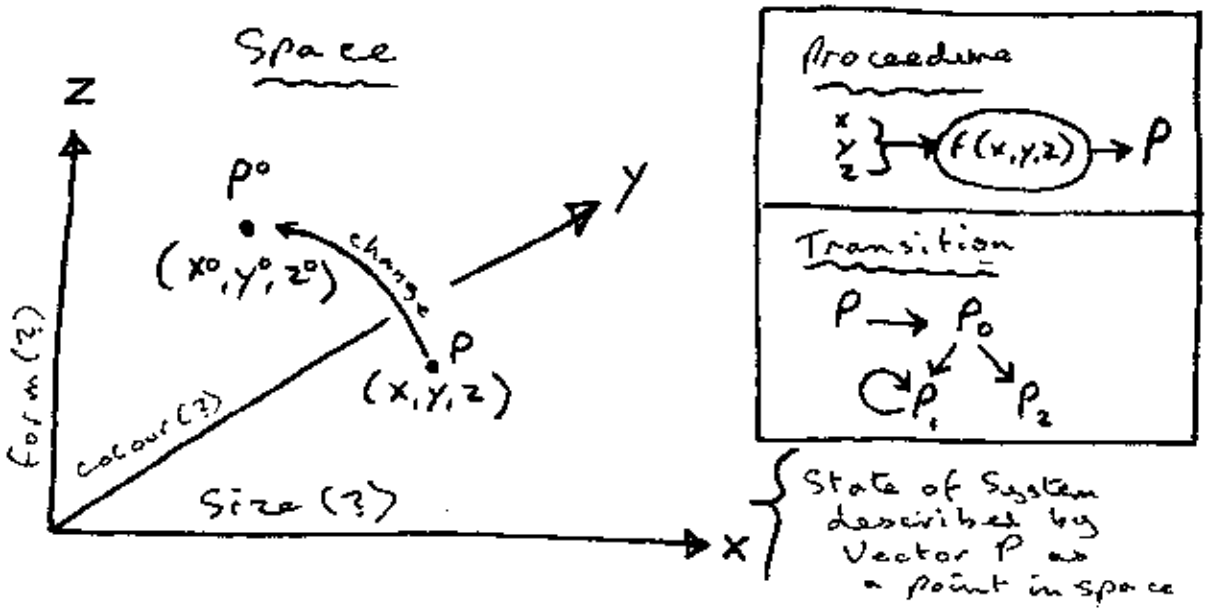


figure
Semi transparent pillars
with red
blue
green
white
} lamps
SPACE MACHINE
distance detector


COSMOLOGICAL MACHINE
Application:
- Video Projection
- Kinetic Image
- Sound
- etc...
AIR
SUN
Sensor
to computer
RADIATED HEAT
Sensor
SOIL
(WATER?)
heating
cooling
morning
t
evening

SPACE FOR A DIALOGUE



Space → Ordered collection of possibilities
(State of a System)

Procedure → Specifies (or moves) a point
- inside a space
- between spaces

Depending on Conditions (Rules)
- inside a dimension (Parameter)
- between parameters
- between spaces

The Rules determine
The characteristics (geometry) of the Space (and vice versa)

Definition of the Space

Number and types of Parameters
- quantative (measurable)
- qualitive (indirect, description, etc)

Relations between Parameters
- deterministic
- Random

} Functions

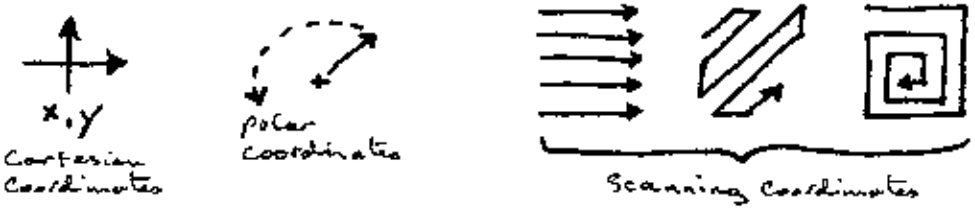
is the 1st level of Aesthetic choice

Transition within space is the 2nd level of Aesthetic choice

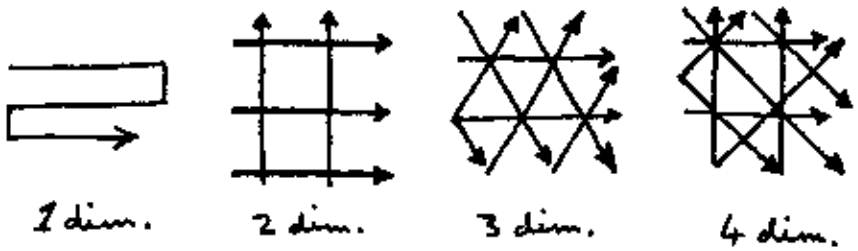
EXAMPLES:

Definition of the Space

Coordinates:

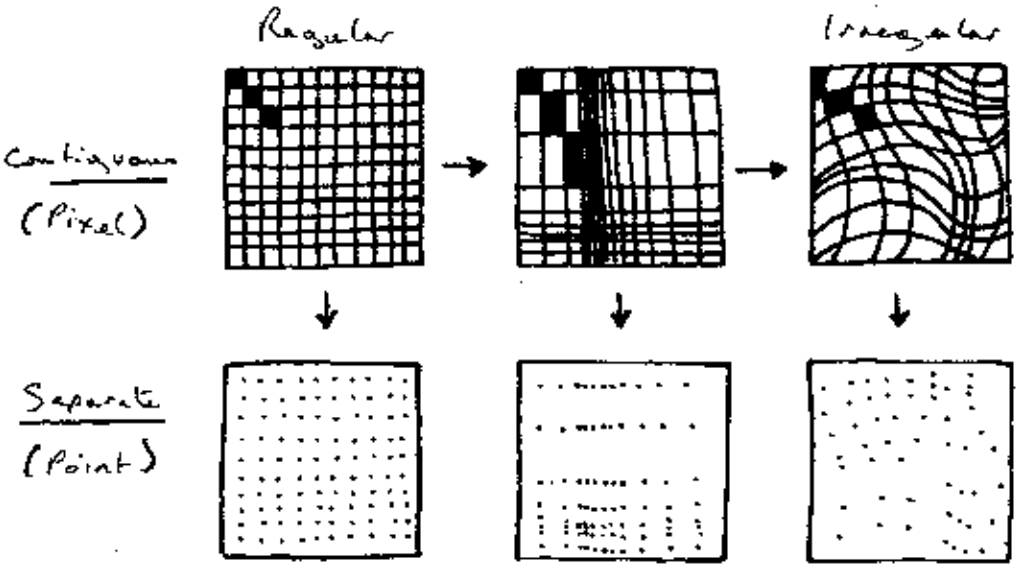


Dimentions:

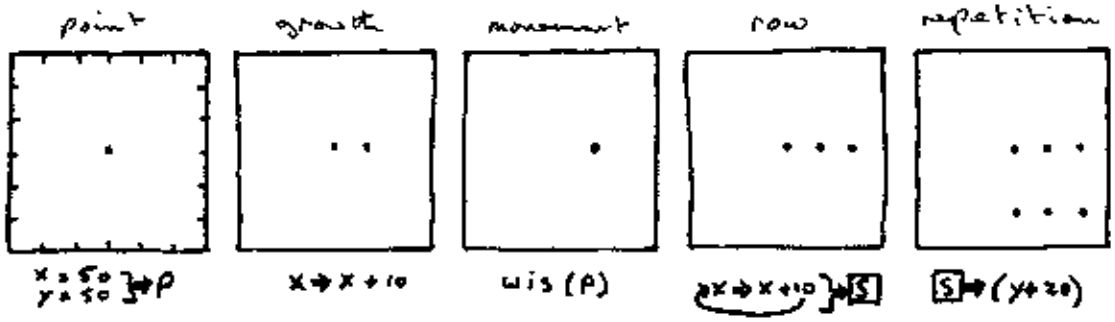


Dimention control = Composition control

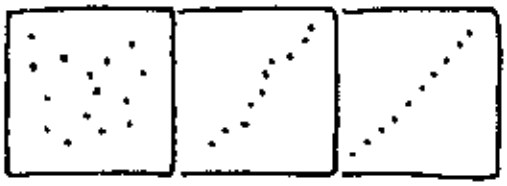
form:



Manipulation of the Space

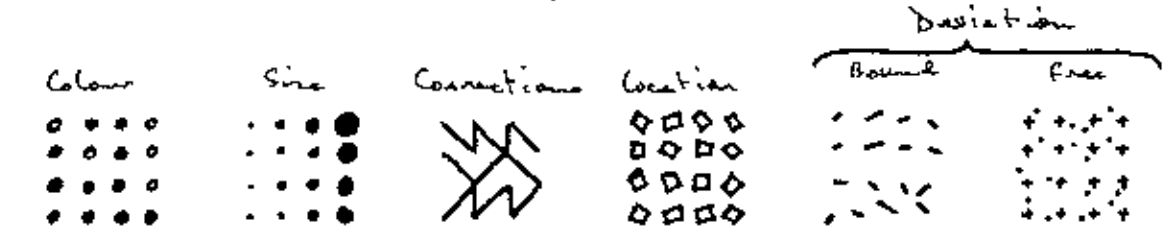


Chaos ↔ Order
{ control over Random }



De Ruimte binnen de Ruimte

Treatment of points



Points can:
- be created
- be moved within space
- be moved between spaces

Forms:

Repeat
Rotate
Mirror
Invert
enlarge/reduce

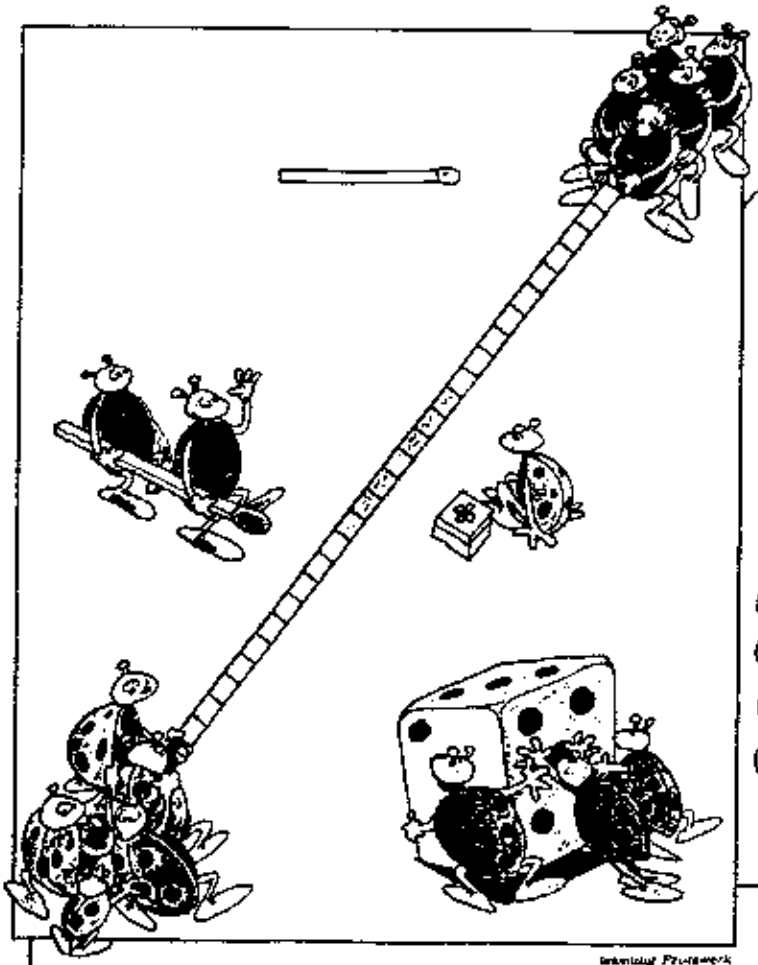
Space:
- distort space
- re-order space (swap dimensions)

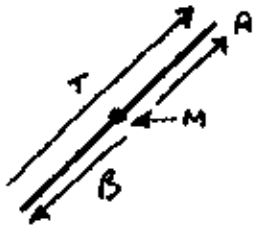
Simple functions

Tug O' War

This Tug 'O War game is played with two people. Put a matchstick on the middle square. Sitting opposite each other each person throws the dice on alternate turns and moves the matchstick in their direction according to the score on the dice. When the matchstick moves over the last square -then that player has won the game.

(Bobo)





(i) $R \rightarrow$ Chance (A_R, B_R)

(ii) $T \rightarrow T + A_R$

(iii) $T \rightarrow T - B_R$

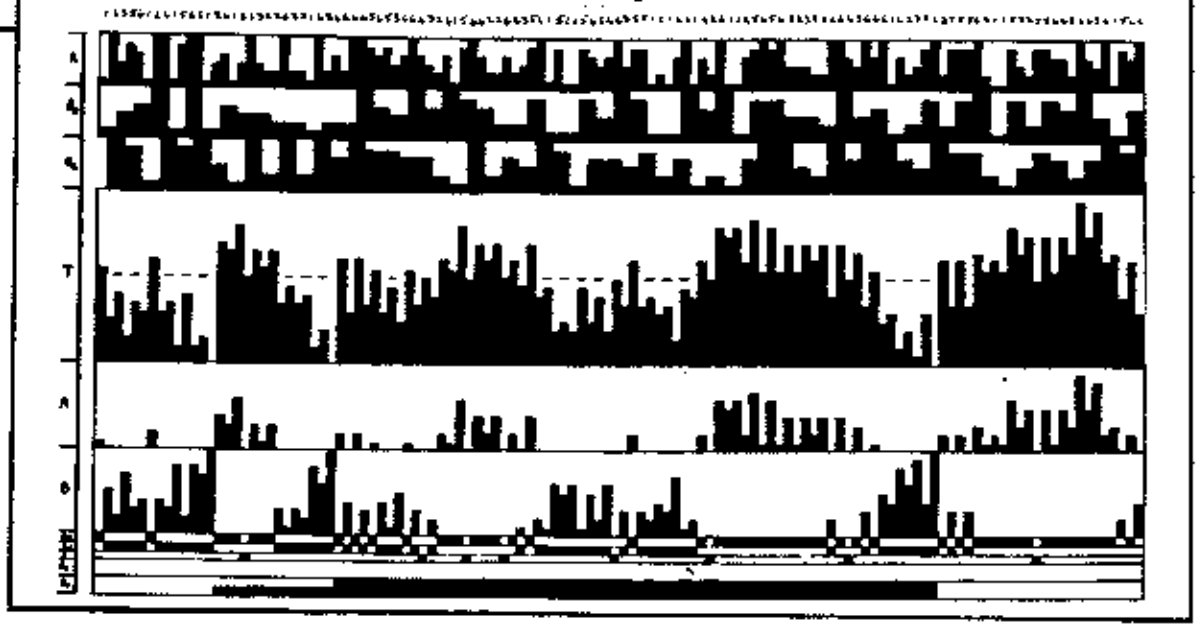
(iv) $A_W = 1$ When $T > M$

(v) $B_W = 1$ When $T < M$

(vi) $N = 1$ When $T = M$

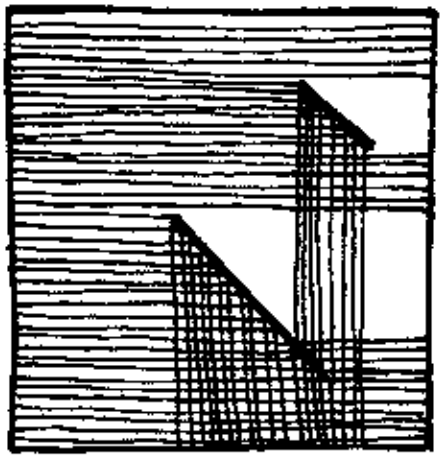
(vii) A_S and B_S = Score A and B

Data as Image



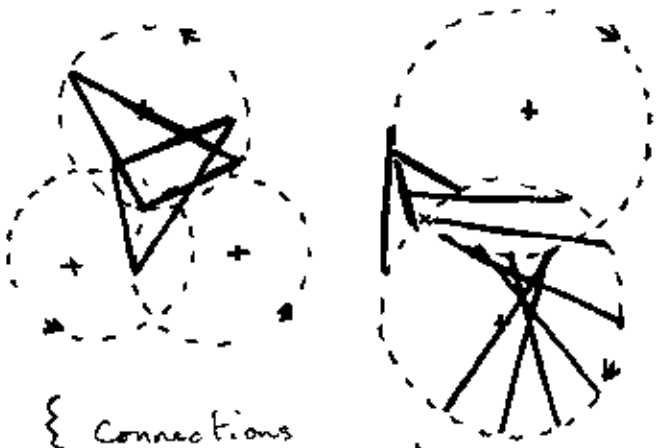
Interactive functions

Reflections (force fields)



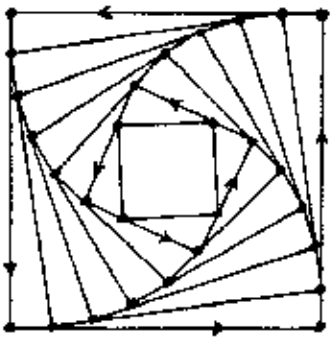
{ matrix with rules to change direction }
(ie. light direction and reflecting angle or wind/water flow, etc.....)

Simple Rotations

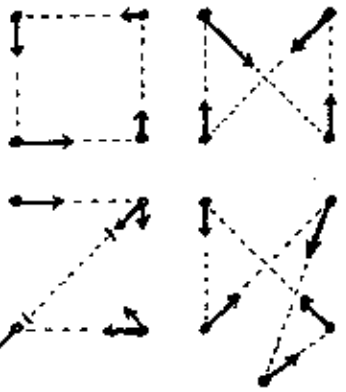


{ Connections between rotating points }

Four Stalking Flies

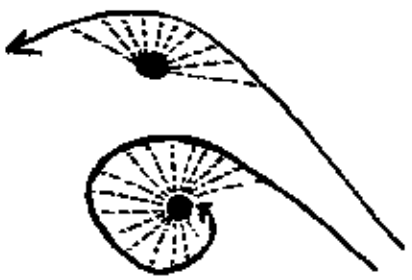


Different:
- no. of flies
- varying speeds
- directions



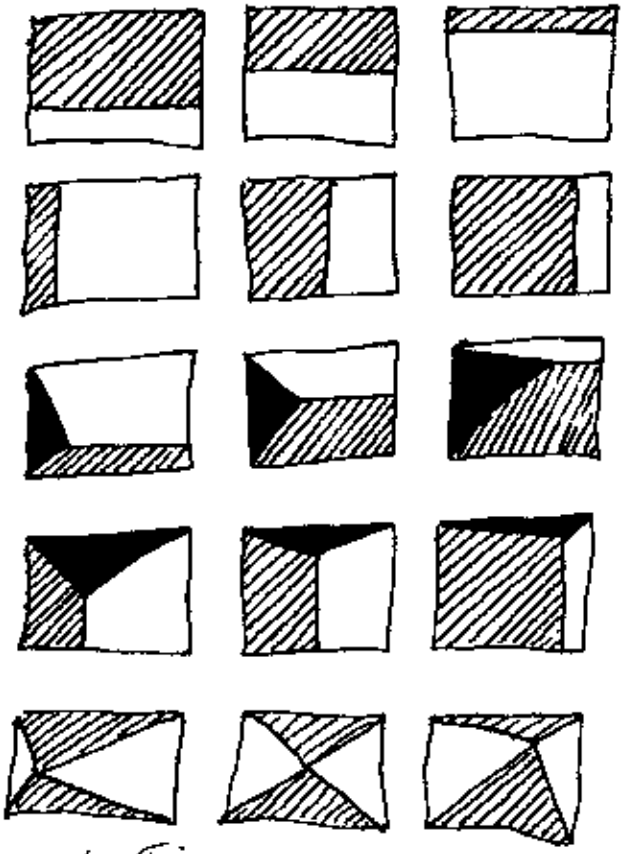
Use as data

Complex Rotations

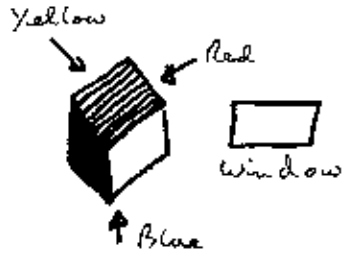


for example,
Solar System
{ gravity, mass, velocity }

ROTATING CUBE (transformational grammar)



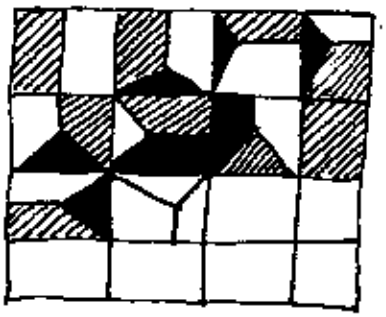
In Time



Connections

- Select element
- Change
- Restore connection

(How many steps)



In Space

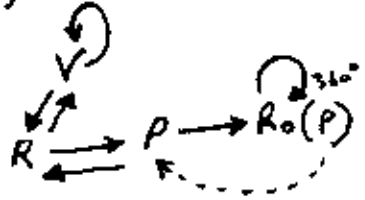
A cube has:

6 sides
12 edges
8 corners

Side → Edge Side (4 + 4)

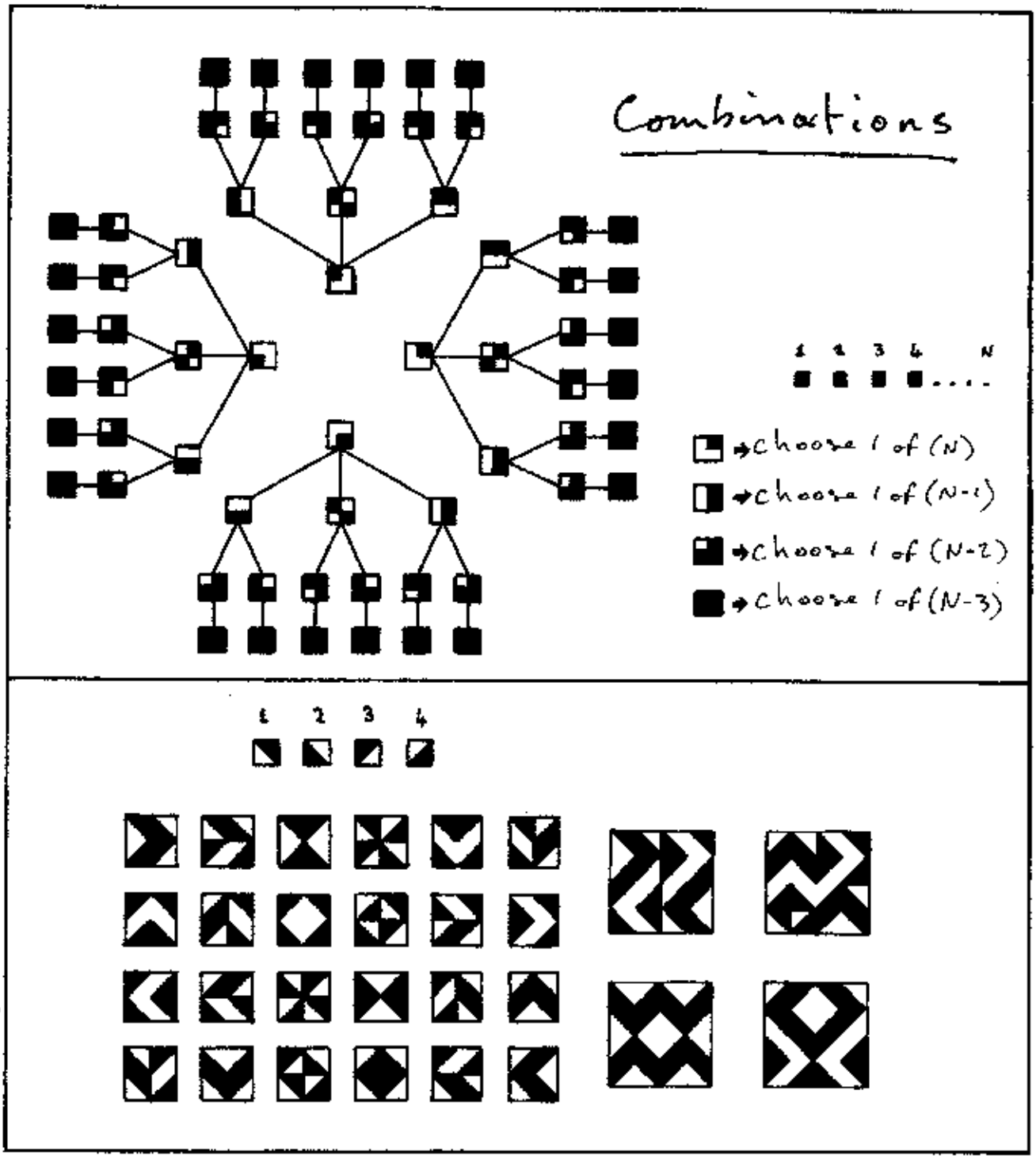
Edge → Corner Side (2 + 2)

Corner → rotate Edge (360° + 3)



Use as:

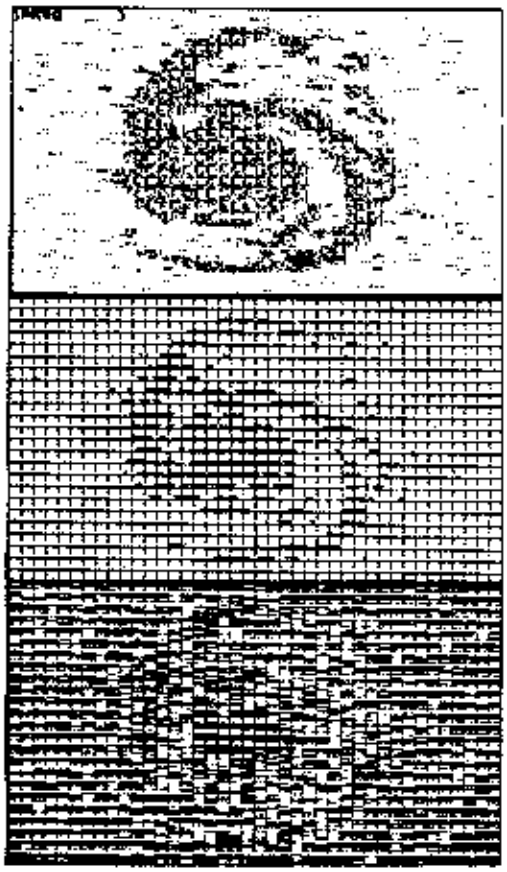
- Image
- Grammar
- data generator


Combinations
1 2 3 4 N
choose 1 of (N)
choose 1 of (N-1)
choose 1 of (N-2)
choose 1 of (N-3)
1 2 3 4


1 2
4 3
1 2 4 3
1 2
4 3
3 4
2 1

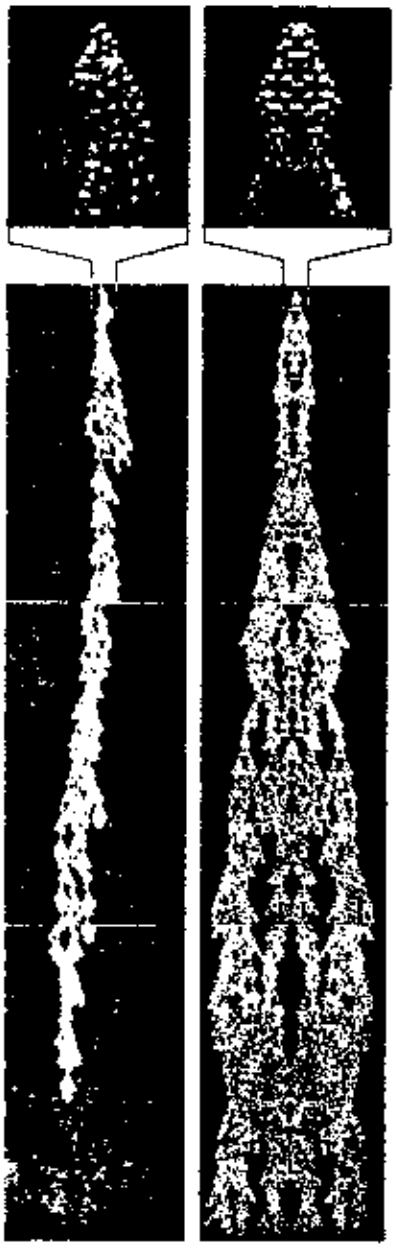
Pixel Operations

Image Processing



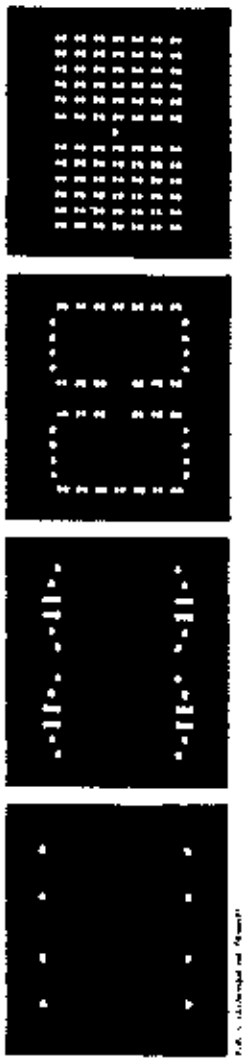
(Lamers/Satten)

Celulare Automata



(Scientific American)

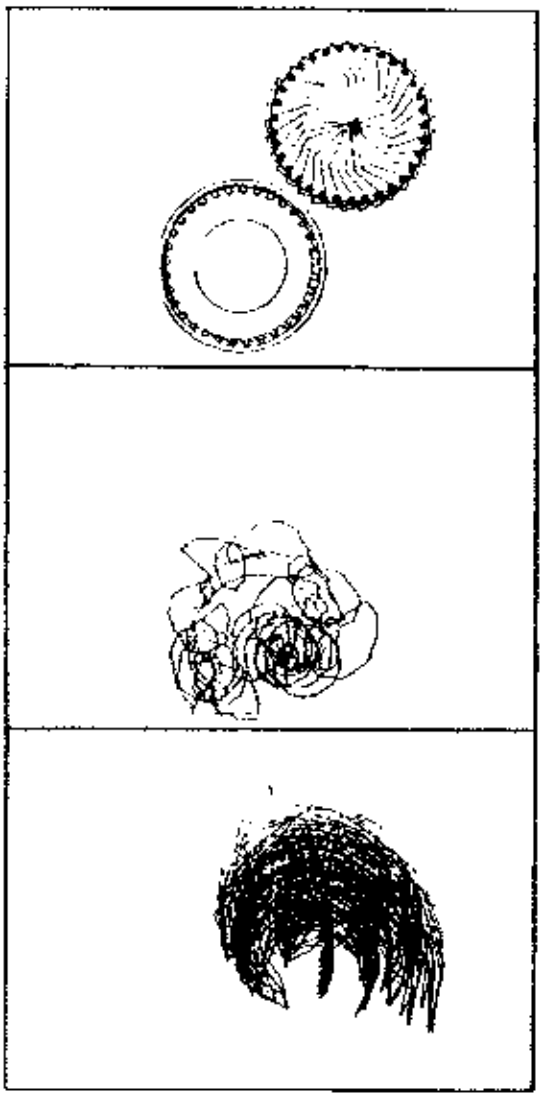
Life



(Kijk)

CHAPTER 7

CONCLUSION



Aesthetics

Hard reality
changed
to dynamic system

investigated
by conceptual machines
unlimited
by material constraint

Solid land
formed
out of a sea
of possibilities

by patterns of rules
and rules for patterns
ordered grammars
and interpreted metaphors

The mathematics of the poetry
becomes
the poetry of mathematics

Technique

Art

just like science has
its rules and its logic

But

The logic of art is
not the logic of science

The Computer

is a rule based symbol processing system

The Scientist

is a rule based symbol processing system

The Artist

is a rule based symbol processing system

But

the computer is developed by
the scientist
to process scientific symbols
according to scientific rules

The Artist

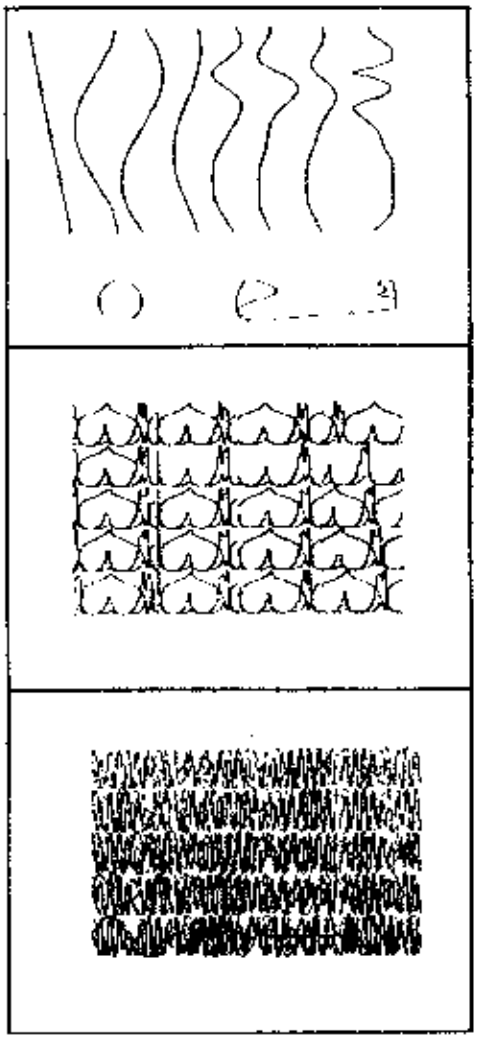
must teach the computer
to process
the symbols of art
according to
the rules of art

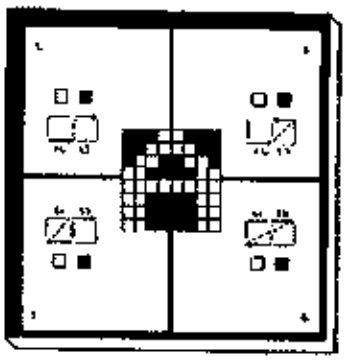
That is difficult

Because the rules of art
are more complex
than those of science

Ambiguous *Clear*
Temporary *Constant*
Personal *Universal*

World
Image
Interpretation



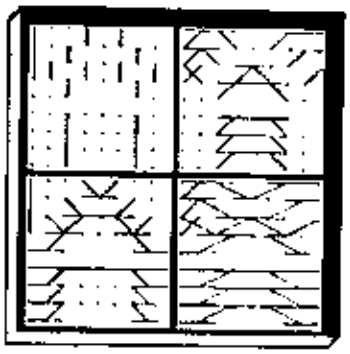


MetaPractice

Without order there is chaos

Ordered deeds (or events)
form a system
The totality of a system
forms a space

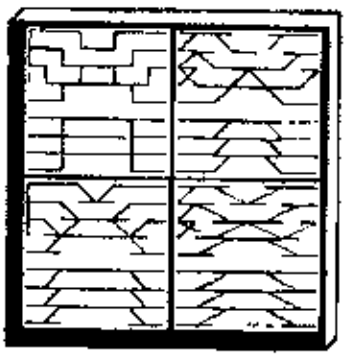
The world is multidimensional



By separating the dimensions
we create various spaces
that are inter-connected

every sense organ
every medium
every language
every system

specifies its own space



An action can be in one space
but the consequences
can be manifest in another space

It is the task of science and art
to research
the relationships between the spaces

So we can understand our world better
by transforming the chaos
into images

The images do not always match
or cannot always match
the reality

But

The more we understand our images
The more we understand our world

With special thanks to

FATIMA LASAY

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