The ARCHITECT

The VISUAL

The AUDITIVE

LUDGER HOVESTADT

ON DIGITAL ARCHITECTURE

BOOKS I–III

BIRKHÄUSER
ETH ZURICH

The ARCHITECT

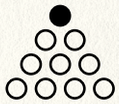
THE TEN BOOKS

The VISUAL

The AUDITIVE

VOLUME I.I

OBSTACLE



BOOK I

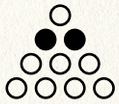
The ARCHITECT

152–362 ↗

About the INCONCEIVABLE OBSTACLE
and the RESPONSIBILITY the author takes.

VOLUME I.II

OBJECTIVITY



The COMPLEX PLANE
of PERSPECTIVE PROJECTION.

BOOK II

The VISUAL

402–576 ↗

About the TIME axis
of the OBJECTIVITY.
It is about LINEARITY:
cause and effect,
origin and truth,
the continuous and the INFINITE.
It works with NUMBERS.

It establishes the DISTINCTIONS in TWOS:
TIME | SPACE
MACHINE | MECHANIC
ORNAMENT | LINEAMENT
...

BOOK III

The AUDITIVE

877–1176 ↗

About the SPACE axis
of the OBJECTIVITY.
It is about CIRCULARITY:
proportions and synchronicity,
right and wrong,
the distinct and the PARADOX.
It is articulated by CHARACTERS.

It establishes the CYCLING through FOUR:
INNER | PAST | OUTER | FUTURE
AIR | FIRE | EARTH | WATER
IDEA | MEMORY | PICTURE | VISION
...

The ARCHITECT

VOLUME II

CHARACTERS and STABILITY

The TRIVIUM, the three verbal subjects of the seven liberal arts.

Applying the schemes
of OBJECTIVITY
to the PROPORTION
of the HUMAN BODY:
SEE | TALK | SHOW | HEAR
SEX | MEMORY | BODY | HEALTH
MODULE | COLUMN | WALL | ROOF

BOOK IV

ENCODING and the SACRED

VOLUME II ↗

Leaving home,
reading and forgetting.
RATIONALISATION.

It is about
the GRAMMAR,
the ORTHOGRAPHIA,
the TRAGEDY,
the SACRED BUILDINGS,
the ENCODING
...

BOOK V

CODING and the PUBLIC

VOLUME II ↗

Negotiation in public,
the global balance
with the other migrants,
the inconceivable.

It is about
the DIALECTIC,
the SCENOGRAPHIA,
the COMEDY,
the PUBLIC BUILDINGS,
the CODING
...

BOOK VI

DECODING and the PRIVATE

VOLUME II ↗

Coming back home,
applying the contracts
to the local reality.
REALISATION.

It is about
the RETHORIC,
the ICHNOGRAPHIA,
the SATIRE,
the PRIVATE BUILDINGS,
the DECODING
...

The VISUAL

VOLUME III

NUMBERS and OPERABILITIY

The QUADRIVIUM, the four mathematical subjects of the seven liberal arts.

BOOK VII

AIR and ARTIFICIAL INTELLIGENCE

VOLUME III ↗

How to see the subject
with today's EYES.
A mood board.

It is about
the GEOMETRY,
the AIR,
the COLOURING (Vitruvius),
the VISUAL SENSE,
the ARTIFICIAL INTELLIGENCE today
...

BOOK VIII

WATER and NATURAL COMMUNICATION

VOLUME III ↗

How to connect the subject
to other cultures.

It is about
the MUSIC / ALGEBRA,
the WATER,
the LEVELLING (Vitruvius),
the AUDITIVE SENSE,
the NATURAL COMMUNICATION today
...

BOOK IX

FIRE and DIGITAL ARTICULATION

VOLUME III ↗

How to model the subject
in today's terms.

It is about
the ASTRONOMY / LOGIC,
the FIRE,
the GNOMONICS (Vitruvius),
the AUDITIVE ACT,
the DIGITAL ARTICULATION
...

BOOK X

EARTH and CULTURAL HERITAGE

VOLUME III ↗

How to anchor the subject
to the old masters.
It is about
the ARITHMETIC,
the EARTH,
the MACHINES (Vitruvius),
the VISUAL ACT,
the CULTURAL HERITAGE
...

The AUDITIVE

The ARCHITECT

The VISUAL

The AUDITIVE

The ARCHITECT

VOLUME I

PREFACE

DEDICATION 1↗
VOICES 7↗
NATURE 17↗
SENSES 23↗
SCREENS 34↗
PRESENCE 42↗
SUBJECTS 47↗
TURN 56↗
NUMBERS and the SUN 66↗
CIRCLES 77↗
RENAISSANCE 87↗
INVARIANCES 94↗
GOVERNANCE 106↗
THREATS 112↗
ARCHITECTURE 118↗
INSTRUMENT 121↗
LITERACY 127↗
LEARNING 138↗
FRITZ HALLER 147↗

The VISUAL

The AUDITIVE

DEDICATION

1

2

These books think about
ARCHITECTURE
as a public statement,
a speech,
a talk,
a designation,
a discourse,
an oration
...

> Plato, Cicero and Vitruvius.
Google, ARCHITECTURE, RETHORICS, AGORA.

3

Not the emperor
is talking today,
he is killed.
Not the princes,
they are driven out.
It is the abstract idea
of a PUBLIC
heading its PEOPLE.

> Etymonline, PUBLIC.

4

The PUBLIC does not come
with PEOPLE automatically.
PEOPLE have to make an effort
to establish a PUBLIC.

5

Estevez, The Public, 2019.

6 These books are dedicated
to the PUBLIC and not to its PEOPLE.
They argue towards an ARCHITECTURE
which gives the PUBLIC a FACE.

7

VOICES

8 This is an unusual enterprise,
not carried by a common sense,
and quite complicated to read.
It needs a step back.

9 Not a theory, no definitions.
No classical understanding.
A scaffold of TERMS
forming a BODY OF THINKING.

10 Written like
in a kind of vernacular,
because these books feel
alienated to language.

11 As they feel alienated
to the digital world.
And they try
to find a new stand.

12 More like exercises
on how to think a world
in terms of quantum physics
and category theory.

13 Where everybody
can talk with anybody
in ABSTRACTION
of space, time and language.

14 And VOICES
which are PUBLIC VOICES
spoken with different
TONGUES.

15 They all think
in quantum physical terms.
They are curious
and learning.

16 There is no
ORIGINAL ARTICULATION.
They all and always
need TRANSLATIONS.

17

NATURE

18 I think of NATURE
as a GIFT GIVEN.
An OBSTACLE,
beyond UNDERSTANDING.

19

NATURE,
being born
to a new world
by mother earth.

20 And of ARCHITECTURE
as a SACRIFICE
to SHARE
RESPONSIBILITY.

21

Temple of Hephaestus.

22

ARCHITECTURE
as a PACT,
a CONTRACT
with NATURE.

23

SENSES

24

Makart,The Five Senses, 1872–1879:
Sense of touch, hearing, sight, smell, taste.

25

One's self is born
with EYES and EARS,
and it
SMELLS, TOUCHES, and TASTES.

26

The INTELLIGIBLE
and the SENSIBLE.

27

PLAYING them,
like a FUGUE,
to make FRIENDS
with NATURE.

28

LOOKING at things
in straight LINES
and going around
to get a full PICTURE.

29

Also HEARING things
from all DIRECTIONS
and focusing
to FOLLOW one.

30

Playing
the INTELLIGIBLES
– global localities –
in counterpoint
to the SENSIBLES
– local globalities –

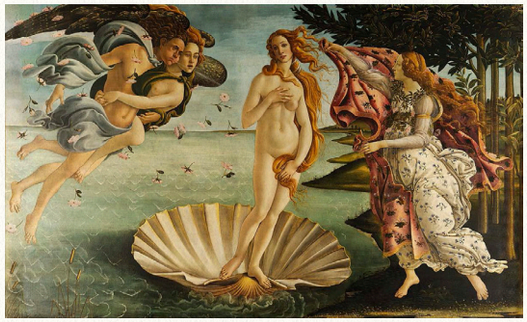
31

The BODY
PICTURES
the MIND.

32

The MIND
IMAGINES
the BODY.

33



Botticelli, The Birth of Venus,
Aphrodite, born from the foam of the sea
1484–1486.

34

SCREENS

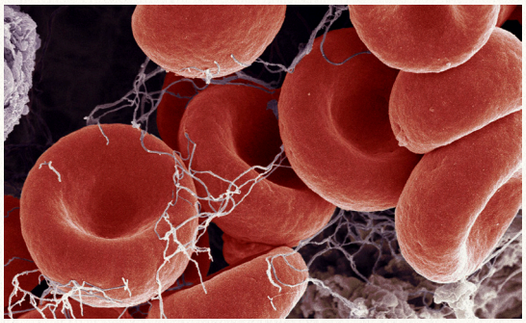
35

The 20th century
SCREENED NATURE
with EYES
of a new SCALARITY.

36

Apollo 17: Blue Marble, NASA 17.12.1972.

37



Human red blood cells.

38

IMAGES are REFLECTIVE.
IMAGES think in straight LINES OF LIGHT.
TRACES of things as PASSIVE OBJECTS.
IMAGES kill the vivid things.

39

SCREENS are PROJECTIVE.
SCREENS think in CIRCLES OF LIGHT.
COLOURS of things as ACTIVE SUBJECTS.
SCREENS embrace the vivid things.

40

An optical trick.
With lenses, prisms,
telescopes and microscopes
in the RENAISSANCE.

41

Cameras, sensors,
processors, networks
and arrays of pixels
TODAY.

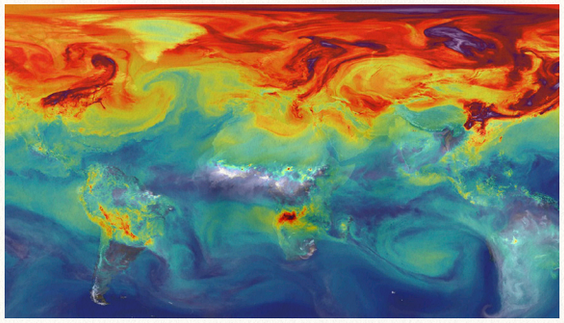
42

PRESENCE

43

2021
The LOSS OF IMAGES.
FACING a planet
on SCREENS:

44



NASA, carbon dioxide concentration, 2006.

45

the ENVIRONMENT
the CLIMATE
the CULTURES
the ECONOMIES
the GENDERS
the HUMANS
...
as PROJECTIVE SCREENS
as ACTIVE SUBJECTS

46

With new eyes, things become active and smart.

47

SUBJECTS

48 Everything shows up
as SUBJECTS,
INCONCEIVABLE,
not as DEFINITE OBJECTS.

49 OBJECTS are unified
by the SUBJECTIVITY
of following LINES
of LOVE.

50 SUBJECTS share
the OBJECTIVITY
of being CIRCULAR
around TRUTH.

51 One can WONDER
around SUBJECTS,
these things so:

52 precious
surprising
hesitant
wroth
enraged
tough
dangerous
attractive
graceful
...

53 One can dress up
as is custom and fashionable
and speak towards a future
unknown to all of us.

54

Zumthor, Residential and Studio House, 2004.

55

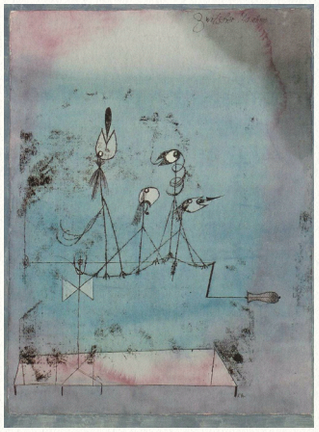
Kairavini Pushkarani, Chennai, 2021.

56

TURN

57 Things are changing fast.
They turn from LINES on EARTH
to CIRCLES in the AIR.
From OBJECTS to SUBJECTS:

58



Klee: Twittering Machine, 1926.

59 ENERGY needs turning
from limited natural resources
towards the sun,
as nature does.

60 MATERIAL needs turning
form the limits of the natural ground
towards recycling,
as nature does.

61 One can see a turn
from thermodynamic REALITY
towards the RATIO
of quantum mechanics and computing.

62 One can see ALL LIVING
in the helix of the DNAs
exposed to an environment
in natural communication.

63 One can see a turn of GENDER
originated in REALITY
towards a HUMANISM
as a RATIONAL contract.

64 One sees the danger
of the ORTHODOX TYRANNY
refusing to see
the world of the new scalarity.

65 One sees the danger of the TERROR
of the MODERNIST EMPERORS
refusing to respect
the inherited scalarities of the world.

66

NUMBERS and the SUN

67 The new SCALARITY
shows up in numbers
beyond all NATURAL proportions:

68 In the last 100 years
the world population grew
by a factor of 5.

69 In the last 50 years
global wealth has increased
by a factor of 60.

70 In the last 50 years
life expectancy has grown
by 20 years.

71 In the last 50 years
an extra 6 billion people
became literate.

72 In the last 200 years
the rate of homicides
went down by 80%.

73 Today
the world energy consumption
is around 600 EJ.

74 Nature's photosynthesis
produces 400 EJ.

75 Solar radiation impact
to our planet is 3'900'000 EJ.

...

76 The reference
is the SUN,
not NATURE,
not EARTH.

77 # CIRCLES

78 Can one want to affirm
that there is no way back
to the intimacies
of the old scalarities?

79 There is not enough space
for all the footprints,
not enough resources
for the traditions, as they are.

80 Circles
do not have a footprint.
they are not about QUANTITIES.
They do not take up space.

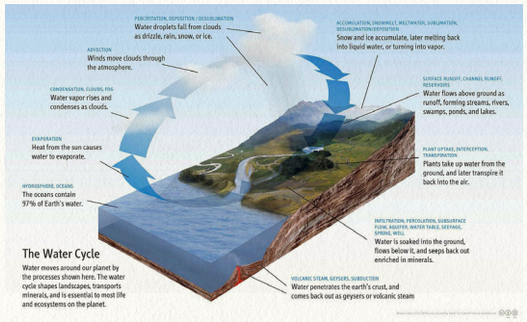
81 They just rotate faster,
to increase numbers.
Circles are about QUALITIES.
And they need time.

82 Circles
are not about PROGRESS,
not about TERRITORY,
nor about the NEW.

83 Circles
are not about a HISTORY
as the logical SEQUENCE
of important EVENTS.

84 Circles
rotate around the PAST,
they bring HERITAGE
in CONSTELLATIONS.

85 Circles repeat.
BIRTH and DEATH.
LIGHT and MATTER.
WATER, AIR, SUN, and EARTH.

86 

The water cycle.

87

RENAISSANCE

88 A RENAISSANCE
is not something NEW.
It is a REBIRTH,
a next GENERATION.

89 An architectural RENAISSANCE
grows around its HERITAGE
and its BODY OF THINKING proudly says:
I want to be an ARCHITECT.

90 This thinking goes with the old masters:
The ARCHITECT knows
WHAT to TALK about [rationcinatio]
and HOW to DO things [fabricas].

91 ARCHITECTURE meets
what people, nature, economy, society
can expect
[utilitas].

92 It is well constructed
and in today's terms
sustainable
[firmitas].

93 And all its aspects
are in good proportions
and beautiful
[venustas].

94

INVARIANCES

95 These few abstract CATEGORIES
do not change, they are INVARIANT.
They are what one can trust in
as a DIGITAL ARCHITECT.

96 Not in materials,
not in constructions,
not in craftsmanship,
not in technology,
not in infrastructures,
not in projects,
not in simulations,
not in productions,
not in sustainability,
not in calculations,
not in analysis,
not in science,
not in art,
not in knowledge,
not in common sense,
not the economy,
not in ecology,
not in structures,
not in ontologies,
not in necessities,
not in social life,
not in empathy,
not in culture
...

97 All these terms are
not abstract enough
to be INVARIANT.
They change over TIME.

98 As an architect,
one also cannot talk
in terms of:

99 the footprints,
the limits,
the growth,
the origins,
the intuitions,
the diversities
...

100 They cannot address
the challenges of today,
which are of a different scalarity.
As are:

101 the electric,
the media,
the communication,
the logistics,
the screens,
the distinctions,
the decisions,
the synthesis,
the new economy,
the contingencies
...

102 ARCHITECTONICS
is talking with these challenges,
is bringing them into constellation
and calibrates them.

103 Everybody knows
the topics of today
that one wants to face
as an ARCHITECT:

104 sustainabilities
green cities
climate change
migration
digital humanities
new materialism
feminism
...

105 ARCHITECTURE
is a generous place
to accomodate the world
in its certain temperament.

GOVERNANCE

106

107 ARCHITECTURE
is not a DISCIPLINE.
It is heading
all disciplines.

108 As ARCHITECTURE
headed
the LIBERAL ARTS
in ancient times.

109 And ARCHITECTURE
always had been
around RHETORIC
and about GOVERNANCE.

110 ARCHITECTURE
gives SOCIETIES,
its POWERS,
a FACE.

111 Not a specification,
not a decision,
not a statement,
not an opinion,
not a call,
not on education,
not on understanding,
not a manifest for agitation,
not an answer to a question,
not a solution for a problem
...
just prior to all this:
a BODY OF THINKING
and a PUBLIC FACE
everyone can talk to.

112

THREATS

113 If one looks around:
societies losing their faces
in the powerful stream
of the new scalarity.

114 All cultures are exposed
to the unrestrained modernism,
of a generic URBANISM
eating their fabrics.

115 They experience
CULTURAL HERITAGE
opening doors
for consumption by tourism.

116 They are flooded
by systematic understandings,
and well-meaning designs
of the new scalarity.

117 Rem Koolhaas names it:
JUNK SPACE or the GENERIC CITY.
I would paraphrase this with the PARADOX:
‘you can’t improve by doing better’.

118

ARCHITECTURE

119 The sciences,
the technologies,
the disciplines,
the theories,
the arts
...
are the INSTRUMENT,
not the PLAYING.
I want to learn to TUNE them
and PLAY them well.

120 Societies need
architectonic constitutions
heading the good intentions
to meet the differences
of us 8 billion people
and the precious nature
on this beautiful planet.

121

INSTRUMENT

122 This treatise
is a mechanic,
a skeleton,
a scaffold.

123 It needs
additional readings
of personal interest
to grow into a fleshed out body.

124 Look things up,
play around and juggle,
and find interesting places
for all things you know and learn.

125 Concepts or persons
are not introduced or explained.
They are just
presented in constellations.

126 It is a text
to work with freely.
An INSTRUMENT
you are invited to learn to play.

127 LITERACY

128 Why the structure of a poem?
There is no adequate language yet
for what this treatise
wants to explore.

129 A straight text
would follow
the lines
of a given language.

130 These poems are more
on rotations,
on constellations,
and symmetries.

131 More towards
CODE.
ALGEBRA:
fixing broken bones.

132 Writing a conventional text
never ends.
Taking conventional images
never touches the details.

133 CODE
gets active
and starts
to run.

134 It frees the words
from their conceptual ground.
They get animated
by your intellect.

135 The style is a balance
of TEXT,
CODE,
and IMAGES.

136 COMMUNICATING.

137 Read them like a sudoku.
No beginning or end,
but symmetries and balances
to explore in open space.

138 LEARNING

139 So first an appeal to the architect,
to train your intellectual craft.
To learn to read and write.
Becoming literate in the digital.

140 Not primarily to get fluid
in using digital tools,
but to be able to talk about
the digital profoundly.

141 To get a voice in the new media.
To become an upright person.
To stand up
as an architect of today.

142 Being literate
you will be able to pass by
the experts and disciplines,
and directly access them all:

143 craftsmanship,
machines,
productions,
talks,
books,
images,
arts,
sciences,
medicine
...

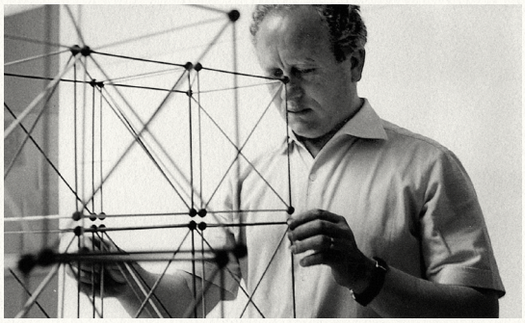
144 access them
– not necessarily master them –
in your own way
in the stream of the plenty.

145 Having all this access
you take a knowing step back,
forget everything you learnt,
rub your eyes
and gain a benevolent view
on the beauty out there.

146 You embody all this knowledge
in the best humanistic tradition.
You are an ARCHITECT
in this new, digital world.

147 # FRITZ HALLER

148



Haller, the General Node,
and the Structural of Crystals.

149 This is a photo of my master
Fritz Haller (1924–2012).
This little man,
talking about the world.
With a few words in a low voice.
And shy gestures
so as not to drive things away.
An architect
not of heavy stones,
but of structures
lightweight and fast.
Not digging the ground,
but embracing the world.
Generous and fragile.
Is there any problem out there?
He would doubt it,
with all his concerns.

150

Horsehead Nebula.

The ARCHITECT

VOLUME

OBSTACLE

I.II

The VISUAL

The AUDITIVE

The ARCHITECT

The RESPONSIBILITY of the Architect

INVARIANCE 151↗
SEDUCTION 176↗
HUMANISM 227↗
INTEGRATION 233↗
THE ARCHITECTURAL SCALARITIES 260↗
THE HUMAN SCALARITIES 278↗
DEDICATION 292↗
THE 20th CENTURY SCALARITY 297↗

INVARIANCE

151

152

Besson, Lucy, 2014, 1:17:40.

153

I,
an alienated PUBLIC,
I imagine myself,
some ten or fifty thousand years ago,
with the same brain capacity
as today
...
I am sitting there
...
relaxed
...

154

Of course I look
at the CIRCLE of the SUN
and I COUNT the LINE [sequence]
of DAYS and NIGHTS.

155

I also COUNT
the plenty of THINGS
and I go AROUND them
to explore their BOUNDS.

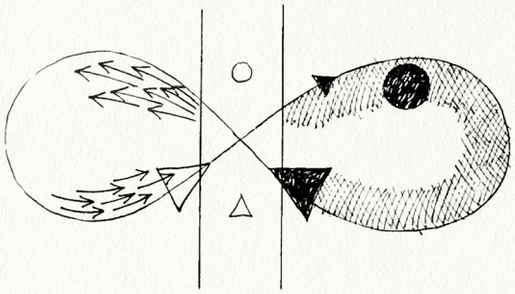
156

The CIRCLES,
the OUTSIDE and the INSIDE,
the SUN, the THINGS and ME,
the LINES of COUNTINGS
...

157 I recognise
these SYMMETRIES.
I start to think
my world around them.

158 It is complex, I admit.
But thinking things
as straight OBJECTS or EVENTS
is simply not enough.

159



Klee, Notebooks Vol. 1, The Thinking Eye, 1961,
Das bildnerische Denken, 1956.

160 When comparing
the me today with the me then
it is difficult not to think
in terms of progress.

161 I take into account
that the brain has not changed.
It always and everywhere
thinks about everything.

162 The worlds
of all times and cultures
are of the same richness
and the same complications.

163 It would be boring otherwise.

164 It's not my brain that changes,
it's the things around that change.

165 It makes a difference
if I have a book
or the internet at hand.
A sword or a gun.
A mechanics
or a quantum mechanics.
...

166 I get a
different person,
if I learn:

167 to run,
to talk,
to swim,
to play the piano,
to touch,
to love,
to read,
to speak your language,
to use a mobile,
a fire,
or electricity,
to grow food,
have kids
...

168 All this is not complicated.
I just make friends
with things.
And I become them.

169 I just trust them,
get interested,
if they are present
and around.

170 I grow
into my ENVIRONMENT
of a certain TEMPERAMENT
and SCALARITY.

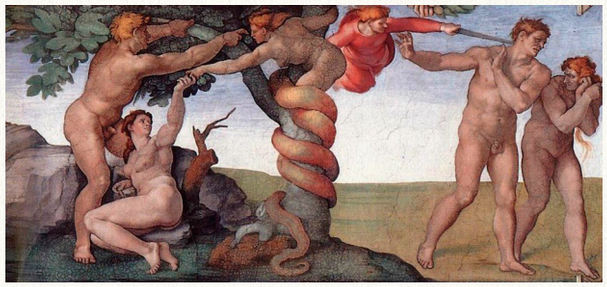
171 'The landscape thinks itself in me'...
'and I am its consciousness.'

Merleau-Ponty, Cezanne's Doubt, 1945.

172 I inhabit IT
like a tree
growing from AIR
towards the SUN.

173 The INTELLECT
is with the ENVIRONMENT.
My BRAIN is INTELLECTUAL
and grows into the intellect.

174



Michelangelo, The Fall and Expulsion from Paradise, 1512.

175 With this intellect
comes POWER.
With this power
I loose INNOCENCE.

176

SEDUCTION

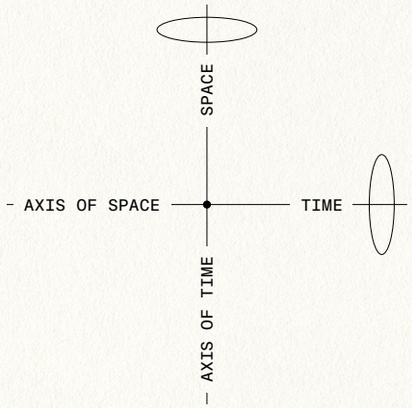
177 Still
sitting there
...
times ago
...
and
...
IT THINKS.

178 IT follows the circles of the SUN
and counts the DAYS and NIGHTS.
IT counts the plenty of THINGS
with their circular BOUNDS.

179 TIME as a CIRCULAR LINE,
passing by.
SPACE a LINEAR CIRCLE,
I can walk around.

180 The SUN circles in TIME
around a HORIZONTAL AXIS OF SPACE.
My BODY circulates in SPACE
around a VERTICAL AXIS OF TIME.

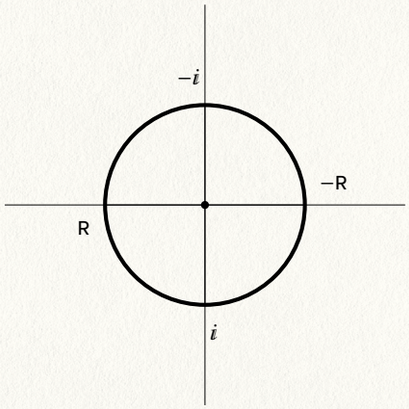
181



182 In mathematics
this is the COMPLEX PLANE
with the REAL AXIS and IMAGINARY AXIS,
NOT to be read as a geometric plane.

183 It is of SPACE and TIME,
not an OBJECT in SPACE
or an EVENT in TIME.
It is both in one.

184



185 I am aware,
that this reading of TIME and SPACE
is following the temperament
of an Indo-European environment.

186 In Greek or Latin language for example
the NOUNS are ‘bodies in space’
the VERBS ‘actions in time’.
And I know the six tenses
to colour the TIME of the verbs
from the PAST to the FUTURE.

187 This is NATURAL to me.

188 The Chinese language
there are no tenses at all.
It looks like
Chinese thinking
acts in space and not in time.

189 My thinking
sheaves actions towards a direction.
Chinese thinking
is more like a surface of water
animated in circles by falling raindrops.
This is what they told me.

190 I go around SPACE
and TIME is passing by.
They go around TIME
and SPACE is passing by.

191 My HORIZON is blocked by massive objects.
My SKY is open and transparent.
Their HORIZON must be transparent
and their SKY massive.

192

Moon gate, Couple’s Retreat Garden, Suzhou, 2009.

193 In fact their things are alien to me:
Their walls, doors, windows,
their floors, roofs, gardens,
their spaces, objects, subjects
...

194 But in any case
there are CIRCLES and LINES,
Or in mathematical terms:
the REAL and the IMAGINARY.
And there is the preservation
of AREAS and the ANGLES.
Or in physical terms:
ENERGY and IMPULSE.
Or in physiological terms:
EARS and EYES.
...

195 These INVARIANCES
are shared by all cultures
and make things work
everywhere:

196 a pillow
a stair
a window
a water pipe
a fireplace
a mobile phone
Penicillin
a scooter
concrete
scissors
chewing gum
a light bulb
a solar panel
...

197 All cultures like these things.
They temper them differently,
to a degree I almost do not
understand anything,
but they obviously like them.
Every time and everywhere.

198

It's so easy to play the things of the new scalarity.

199 This is not simple at all.
These new things
are so convincing,
so seductive.

200 They are alienating
everything I know.
A promise from a foreign land.
Just working in ways unknown.

201

The Rape of the Daughters of Leucippus,
Peter Paul Rubens, 1618.

202 I had never seen things like that.
I play around, ashamed.
I know my betrayal to my habits.
It's so easy, so tempting.

203 After a while
I get used to these things.
I understand them
in my terms.

204 It must be like this
with all CULTURES,
must have been
with all TIMES.

205 It just needs
time,
trust,
in me
as a person.
in us,
as a society.
Us
as humans.

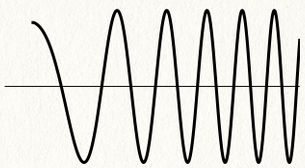
206 These things
of intellect
grow in all colours
like in a GARDEN.

207 They change
my ENVIRONMENT
to another FREQUENCY.
A slide shift in SCALARITY.

208 Like the weather.
It changes,
it is everywhere.
I am exposed.

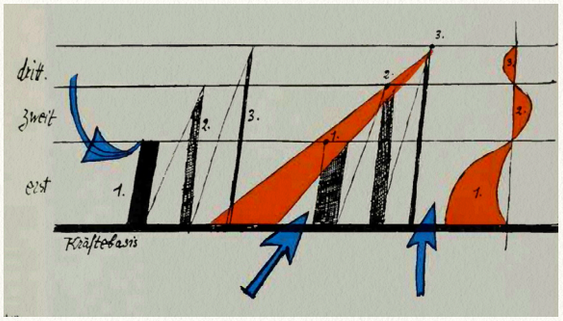
209 And I tune my thinking
to the temperament
of the environment,
changed.

210



211 Over time
with more things coming,
frequencies rise,
showing higher resolutions.

212



Klee, Notebooks Vol. 1, The Thinking Eye, 1961,
Das bildnerische Denken, 1956.

213 I look at the past 5000 years
and see number ranges
of different scalarities and powers
for counting and measuring.

214 I can explicate
the NUMBER of things
with NATURAL numbers,

215 I can explicate
the PROPORTIONS of things
with RATIONAL numbers,

216 I can explicate
the PROPERTIES of things
with REAL numbers,

217 and I can explicate
the VIVIDNESS of things
with COMPLEX numbers.

218 I read these number scalarities,
as a METAPHOR
for CONSTELLATIONS
in historical time.

219 This reading of numbers is in reference
to Hermann Weyl's CONTINUUM,
and not to be confused
with Brouwer, Frege or Russell.

220 I take languages
and the mechanics of writing
as a further example:

221 On the scalarity of mechanics
in the Bronze Age
– NATURAL numbers –
and the writing with hieroglyphic
and cuneiform characters
a specific 'TALK'
could be stored, processed,
and transmitted.

222 On the scalarity of mechanics in antiquity
– RATIONAL numbers –
and the writing with the phonetic alphabet
all 'TALKS' within a single language (Greek)
could be stored, processed,
and transmitted.

223 On the scalarity of classical mechanics
– REAL numbers –
and with the printing press
all texts within any specific language
could be stored, processed,
and transmitted.

224 On the scalarity of quantum mechanics
– COMPLEX numbers –
and with computing
and artificial intelligence
all languages
can be stored, processed
and transmitted,

225 On today's scalarity
everybody is able
to talk in all languages
about everything.

226 This is fascinating,
gives an enormous new power
and obviously
needs to be CIVILISED.

227 # HUMANISM

228 In the Greek tradition
the civilisation
of a new scalarity
is called HUMANISM.

229 A HUMANISM never was about
explicating DIVERSITIES of a common origin,
never about a REVOLUTION or EQUALITY
never immediate to theory,
understanding, or truth.

230 A HUMANISM always was about
being able to talk in a new tongue,
integrating the unexpected DIFFERENCES
showing up on a new scalarity.

231 I abstract from everything
I know and am comfortable with,
to be a generous host
to the inconceivable and unknown.

232 HUMANISM
is an expulsion or a seduction
from save ground
to a new scalarity.

233 # INTEGRATION

234 ARCHITECTURE today
is NOT about celebrating
nature, other cultures, us humans,
as of the same origin and DIVERSE.

235 ARCHITECTURE today is about
facing nature, cultures, us humans,
as inconceivable and rich
in DIFFERENCES.

236 The millennia-old competition
between the WEST and ISLAM
or the rising power
of CHINA today:

237 They are
too fast and too strong
to find common ground
for DIVERSITIES.

238 But I can affirm
the DIFFERENCES
and start to talk about
a common future in wealth.

239 ARCHITECTURE
is not about DIFFERENTIATION
or the INTEGRAL.
It is about DIFFERENCES
and INTEGRATION.

240 On today's complex scalarity
computing enables me for example
to read and write all languages.
Which is fantastic and new.

241 But I have to cross the border
and sacrifice the INTEGRAL,
the UNDERSTANDING of my LANGUAGE
as my friend has to do too.

242 With these probabilistic translations
we do not share our UNDERSTANDINGS,
we share the DIFFERENCES of our TALKS,
and we mutually have
to give them MEANING.

243 I, as a European, cannot, for example,
insist on HUMAN RIGHTS,
because this is a Western concept
of DIFFERENTIATION.

244 This is not in tune
with the constellation of today,
which needs
INTEGRATION.

245 And it is also
of the scalarity of REAL numbers
and by far not powerful enough
to meet the COMPLEX scalarity.

246 CIVIL RIGHTS would be
the corresponding concept
of INTEGRATION
and in tune with today's constellation.

247 But until now
we only know INTEGRATION
on the scalarity
of the RATIONAL and REAL numbers.

248 Yes it is complicated.
Nobody knows
and there is no
solution.

249 These things
cannot be decided.
They stay open
and talking.

250 It is an AFFAIR.

251 But what to trust in
across all times and cultures?
Besides the positivity
of actual forces and powers?

252 MATHEMATICS.
The uncorrupted one.
No pragmatics.
Across times and cultures.

253 Forget the cliches about her.
She is not about numbers,
control, and complicated formulas.
She is the Royal Path to Knowledge.

254 She is able to indicate
adequate ABSTRACTIONS
to integrate and differentiate
on all scalarities.

255 Leibniz for example,
at the end of the 17th century,
developed the binary number system,
we today refer to with the calculus.

256 He developed it with the explicit goal
of establishing diplomatic relations
with the Chinese emperor Kangxi.
Which unfortunately did not work out at all.

257 Nevertheless
computers today,
they are running everywhere
in all cultures.

258 And people love and hate them
in their own ways.

259 Still, computers are running
all the same.

260

THE ARCHITECTURAL SCALARITIES

261 Finding the right ABSTRACTIONS
is not a simple task.
I suggest this
SKELETON OF SYMMETRIES:

262 The ten books of Vitruvius (1st century BC)
on the scalarity of the RATIONAL numbers
are about the characteristics
of BUILDINGS
using these six categories:
ordinatio, dispositio, eurythmia,
symmetria, decor, and distributio.
Very strange for people today.

263 The ten books of Aberti (15th century)
on the scalarity of REAL numbers
are about the characteristics
of BUILDING ELEMENTS
using these six categories:
locality, area, compartition,
wall, roof, and opening.
Very common for people today.

264 Today there is an architecture
on the scalarity of COMPLEX numbers
writing about the characteristics
of PROPERTIES of BUILDING ELEMENTS,
and this treatise is asking for six categories.

265 This book
develops the categories
around the HUMAN SENSES.

266 It takes OPTICS,
the physics of space
as a METAPHOR.

267 The OPTICS of ANTIQUITY
is about WHITE LINES of light.
This is how the notion of space
is constituted with RATIONAL numbers.
These lines are able to
articulate sculptural elements.

268

Temple of Hephaestus, Athens, 415 BC.

269 The OPTICS of MODERNITY
is about the curvature of lines of light.
There are mechanics of lenses
and spectra of colours.
At the scalarity of REAL numbers
space is not full of lines
but of COLOURS.
These colours are able to
articulate lines.

270

Alberti, Santa Maria Novella. Florence, 1470.

271

The OPTICS since 1900
is about the curvature of colours of light.
There are electromagnetic antennas,
cameras, and screens.
At the scalarity of COMPLEX numbers
space is not full of lines or colours,
but of IMAGES.
These images are able to
articulate colours.

272

HdeM, Elbphilharmony in Hamburg, 2017.

273

These examples show,
that the scalarities
are not competing
in space or time.

274

It is more about
another resolution.
One can see buildings
with different EYES.

275

There is also no reason to forget
the schemes of the other scalarities.
They just show other FACES
and talk differently.

276

This is the reason why
CULTURAL HERITAGE
or in Alberti's term
ARCHEOLOGY
is of key importance.

277

Without the BODIES
of the prior scalarities
there would be nothing
I can BUILD on.

278

THE HUMAN SCALARITIES

279

ARCHITECTURE
is always proportioned
around the human body.

280

It is us,
the HUMANS
contracting NATURE.

281

This is not,
exactly not
ANTHROPOCENTRIC.

282

This is not,
exactly not
EUROCENTRIC.

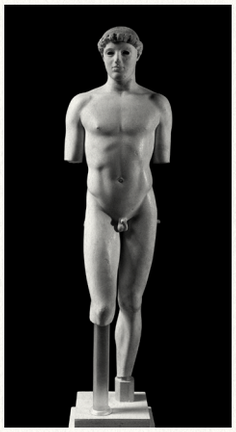
283

Nevertheless
the WESTERN HUMAN
showed up like this
in the different scalarities:

284

The SCULPTURAL body in ANTIQUITY

285

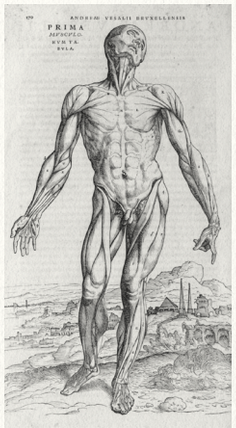


Greek W 'in space': Kritios Boy, c. 480 BC.

286

The ANATOMICAL body in MODERNITY

287



Vesalius, De Humani Corporis Fabrica Libri Septem, 1514–1564.

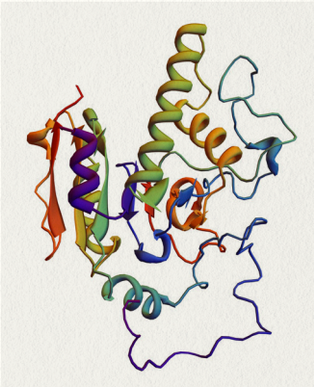
288

Parmigianino, Self-portrait in a Convex Mirror, 1524.

289

The PERCEPTIVE body TODAY

290



Protein ABO.

291

Hiroshi Ishiguro, Geminoid, 2007.

292

DEDICATION

293

The CATEGORIES of ARCHITECTURE
have always been in synchronicity
with rhetoric
and good governance:

294

Vitruvius
on the RATIONAL scalarity
addressed his treatise
to the EMPEROR Augustus.

295 Alberti
on the REAL scalarity
to his colleagues
and the wealthy CLIENTS.

296 This text
on the COMPLEX scalarity
to students
and SOCIETY.

297

THE 20th CENTURY SCALARITY

298 "In front of the door of the house built at the foot of alpine pastures, a little girl of three is playing; as a birthday gift yesterday, she received a cream pink doll with green pants. Behind her, the calm facade with stone lintels still shines with the ochre paint applied with a great deal of effort back when the hay harvest abounded seven years ago. Her grandfather built the metal shed to the left of the main building, itself constructed at the beginning of the last century on the ruins of an old windmill erected in the location of an ancient monastery set up long ago on the premises of a temple—whether Roman or Gallic, we have forgotten—in front of rocks moved by a thousand-year-old flood on the part of this dancing and malicious torrent whose course is dug into the Jurassic strata of the mountains enclosing the semicircular horizon beneath snows said to be eternal."

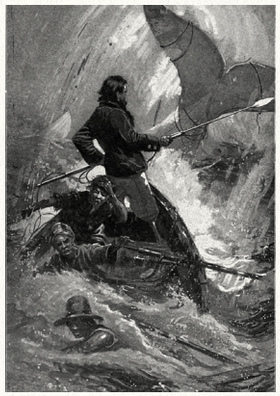
Serres, The Incandescent, 2003.

299 Around 1900,
a new scalarity of space opened up.
Best known by quantum physics,
relativity theory, and spacetime.

300 It comes with
a new mathematics,
new thinking,
and new techniques.

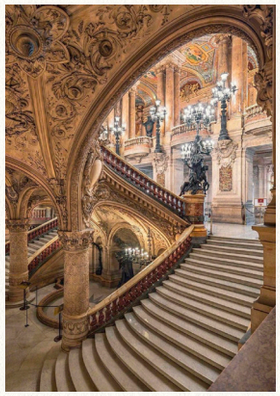
301 As always in those times
of a new scalarity of space
the cultural challenge is
to CIRCULATE the REALITY.

302



The dramatic inside view on the REAL scalarity.
Melville, Moby-Dick, 1851,
Illustration of the final chase, 1902.

303



The dramatic inside view on the REAL scalarity.
Staircase of the Opera Garnier, Paris, 1875.

304 The late 19th century
with its wild inner turbulences:
Sherlock Holmes,
Sigmund Freud,
Karl Marx
...
OBJECTS of SUBJECTIVITY

305 Then, a Copernican Revolution:
from the REALITY of linear circles
on a massive GROUND
towards the RATIO of circular lines
in AIR and LIGHT.

306 All things are of circulation now,
they get their own MEMORY
and they COMMUNICATE
in CONSTELLATIONS.

307

An outside perspective on the COMPLEX scalarity.
Square of the Republic, Belgrade, 2012.

308 ACTIVE SUBJECTS
of OBJECTIVITY,
not OBJECTS
driven by SUBJECTIVITY.

309 By the way,
this conception is exactly
what Kant is emancipating from
and what Hegel is fighting against.

310 I do not think they are wrong.
But their writing is of long ago
and today's intellectual environment
has changed to a phase of INVERSION.

311 I, the alienated PUBLIC,
I read them with interest,
but I turn their arguments
inside-out.

312 And I am exposed
to this STAGE of the new scalarity
where these new active things PLAY around,
where they all TALK with their own VOICES.

313 As there is
the COMPLEX scalarity in SCIENCE:
the quantum,
the DNA,
the X-rays
organic chemistry
...

314

315 The COMPLEX elements
of TECHNIQUES:
the processors,
the digital recordings,
recycling
...

316 The COMPLEX views
on NATURE:
the climate,
the glaciers,
the trees,
the insects
...

317

318 ...
The COMPLEX elements
of CASUAL LIFE:
the cars,
the drugs,
the chewing gum,
the bikinis
...

319

320 I am not talking
about TECHNOLOGY,
this distant thing
which is definite.

321

Grist, Simoda, Japan, 2009.

322 I am talking
about TECHNIQUES,
which are around,
which can become me.

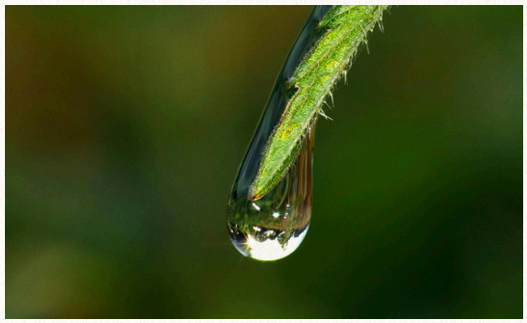
323 I get used to techniques,
I incorporate techniques,
I become another person,
I EMBODY techniques.

324 I, the PUBLIC,
I am not any longer
what I can DO.
I am what I can THINK about.

325 As a HUMAN
I enter a new day
in bright sunlight
and meet the other SUBJECTS.

326 They all show up
in new colours.
These vivid bodies
begin to TALK.

327

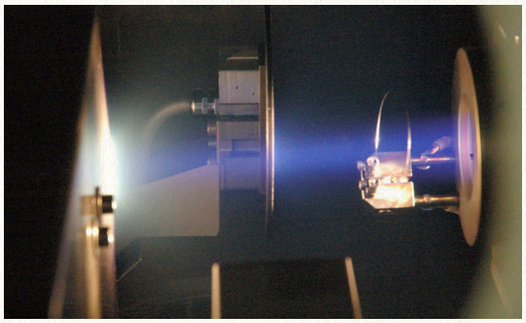


328

329

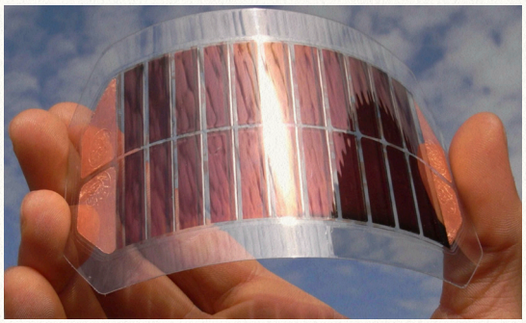
330 These technical THINGS
increasingly get powered
by ELECTRICITY
collected from the SUN.

331



Doping semiconductors to produce
sensors or actuators,
memories and processors,
light emitters or photovoltaic cells.

332

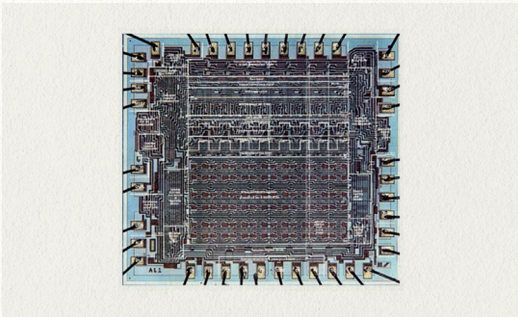


A flexible photovoltaic cell.

333

PROCESSORS
run any function,
they communicate wirelessly
and worldwide.

334



Four Phase Systems, Inc. AL-1 processor, 1969.

335

All technical infrastructures
of hard wires, pipes and ducts
are about to vanish,
replaced by small smart devices.

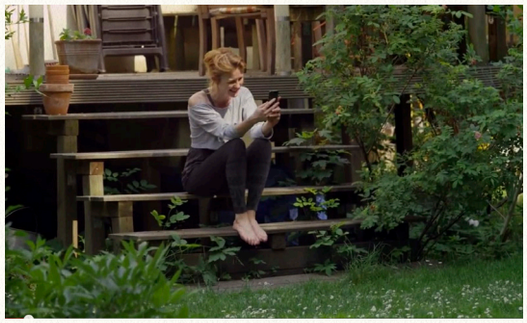
336

Electric wiring, Japan, 2009.

337

All functions
turn to
APPLICATIONS
and SERVICES.

338



Mobile computing, 2013.

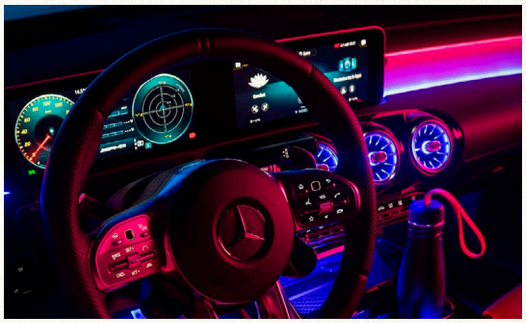
339

Look for example
at the LIGHT:
it is not a fire,
it is not a bulb,
or an optical machine
any more.
Light is just there
by these tiny LEDs.

340

Things
get sculptured
in the imaginary light
of quantum technique.

341



Mercedes Benz, Ambient lighting, 2020.

342

It is the same with:
sound
air
water
safety
security
...

343

It does not matter
whether it is:
technical,
natural,
cultural,
or
casual.

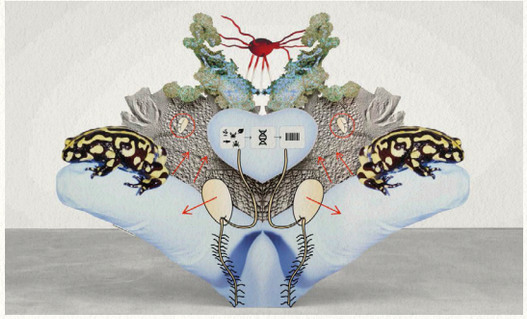
344

Things
get sculptured
in light
of a new scalarity.

345

Growcer, Indoor vegetable farm, 2020.

346



Novitskova, Approximation.
The Apocalypse's Many Horsemen, 2020.

347

Kyoto, Japan, 2012.

348

Things are just there
in their colours
beyond all reality
without any reason.

349

Just because I say,
I want to be like that.
In contract with nature,
not sourced by nature.

350

Naoshima, Japan, 2012.

351

Peter Funch, Two to Tango, New York, 2010.

352

These bodies are powered
by the radiation from the sun
– again with quantum techniques –
bypassing nature.

353

Photovoltaic can be read as
artificial photosynthesis
bypassing nature in terms of energy.

354

No need to
cut down trees
to burn coal or oil.
Nature is nature.

355

These bodies are out
of the natural cycles.
They are running their own
quantum cycles.

356

They are not using
or consuming nature.
HUMANS face nature,
contract nature.

357

They tune their bodies
towards HEALTH
and get aware
of the ENVIRONMENT.

358

And I argue
there is no way back.
Because there are 8 billion
like me on this tiny planet.

359

There are not enough resources,
there is not enough food,
there is not enough space.
The reality of nature is not enough.

360

I go natural.

361

Bowie, The Man Who Fell to Earth, 1976.