

13. Sozialwiss. Ansatz im Design Research

Designing als Interaktion

- “Kinds of seeing in designing”
 - The Reflective Turn in Design Research
- Konzepte: Gestalt; Rahmen; Designing practices; tacit knowing;
- Beispiele aus Fallstudien

Schön & Wiggins: Kinds of seeing and their function in designing

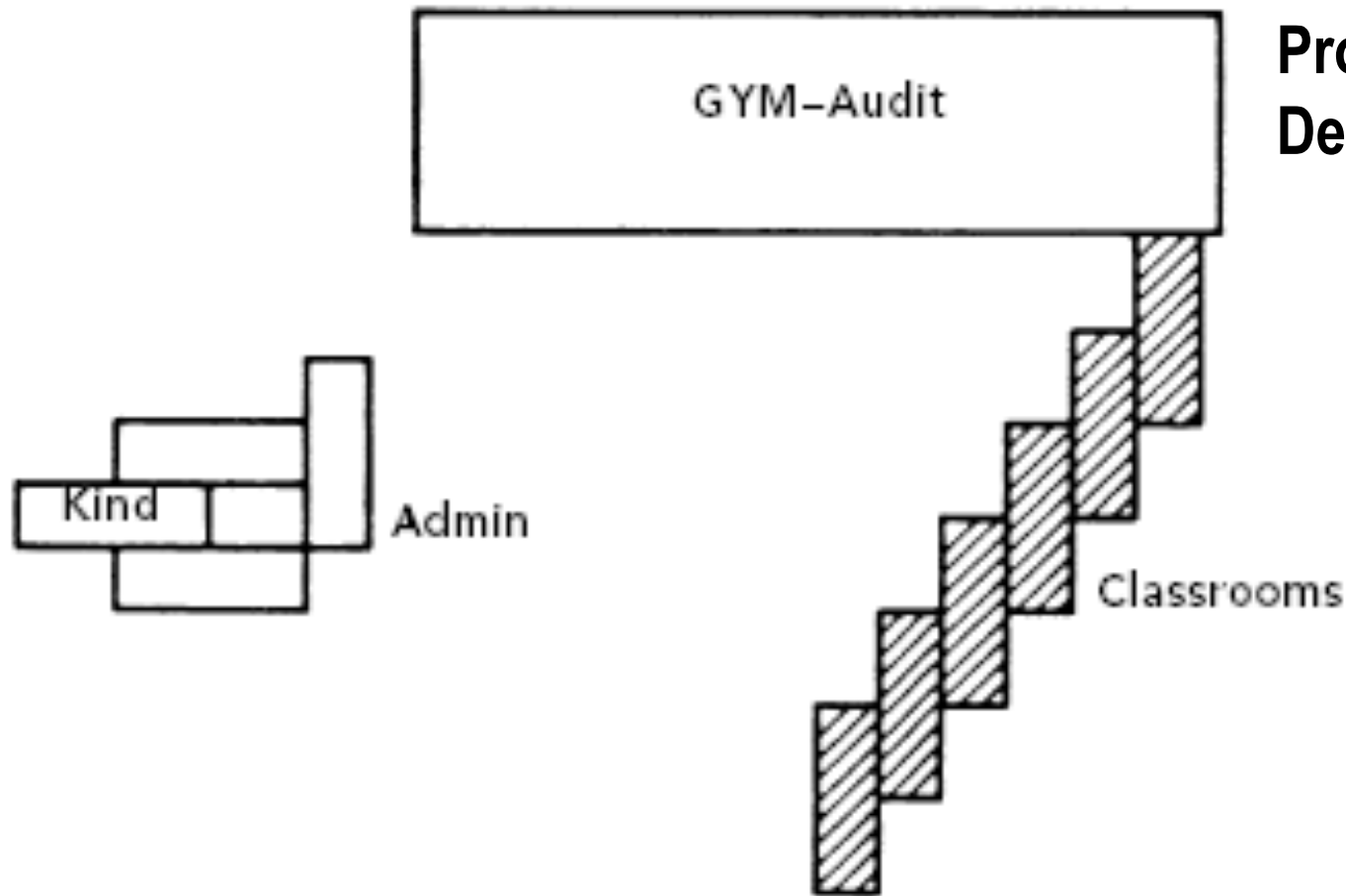
describe architectural **designing as** a kind of **experimentation** that consists in **reflective »conversation« with the materials of a design situation.**

A designer sees, moves and sees again. Working in some visual medium - drawing, in our example - the designer sees what is 'there' in some representation of a site, draws in relation to it, and sees what has been drawn, thereby informing further designing.

In all this '**seeing**', the designer not only visually registers information but also **constructs its meaning - identifies patterns and gives them meanings beyond themselves.** Words like 'recognize', 'detect', 'discover' and 'appreciate' denote variants of seeing ...

Our purpose is to explore the kinds of seeing involved in designing and to describe their various functions. At local and global levels **designing is an interaction of making and seeing, doing and discovering.**

(Design Research describes) the ways in which this sort of interaction works.

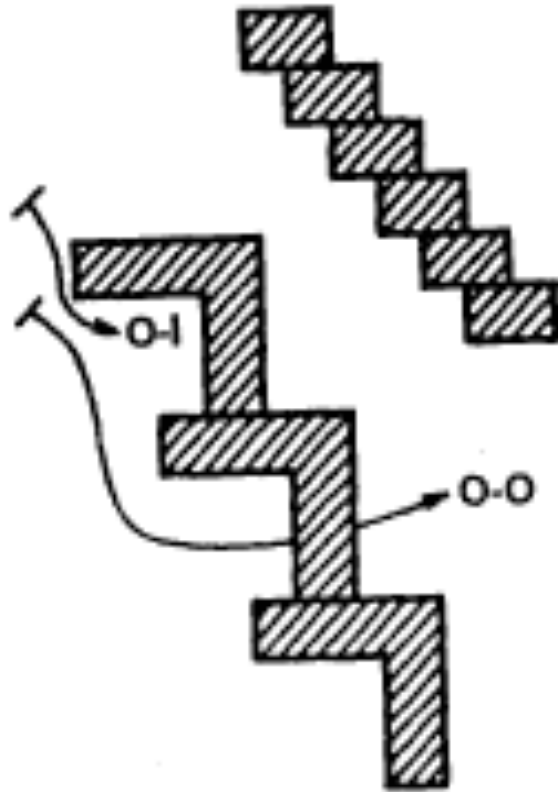


Projekt (review)
Design einer Schule

Petra: I am having problems getting past the diagrammatic phase

I've tried to butt the shape of the building into the contours of the land there—but the shape doesn't fit into the slope.

Projekt (review) Design einer Schule



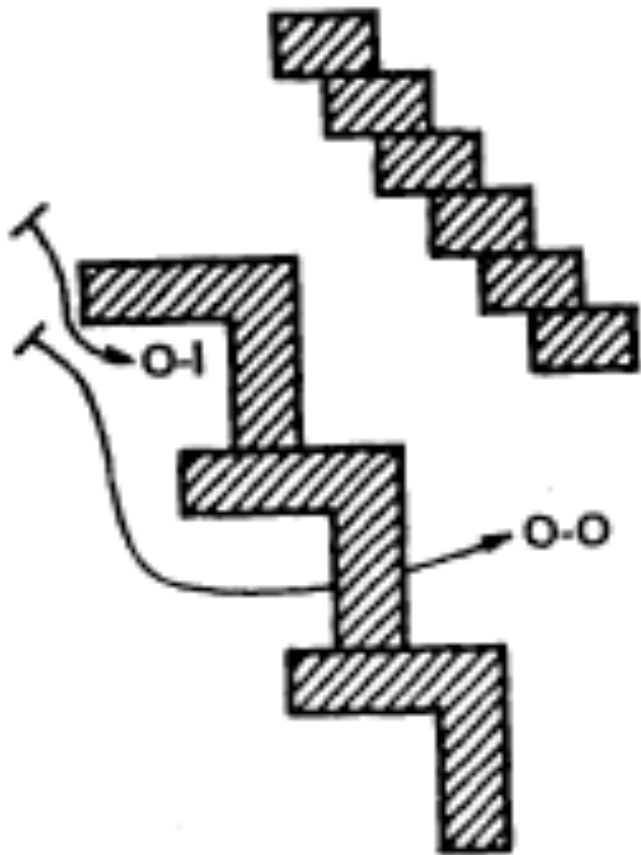
Petra (student):

“I had six of these classroom units but they were too small in scale to do much with. So I changed them to this more significant layout (the L-shapes). It relates grade one to two, three to four, and five to six grades, which is more what I wanted to do educationally anyway. What I have here is a space which is more of a home base. I'll have an outside/inside which can be used and an outside/outside which can be used - then that opens into your resource library/language thing.” ...

Q: You should begin with a discipline, even if it is arbitrary, because the site is so screwy—you can always break it open later.

Projekt (review)

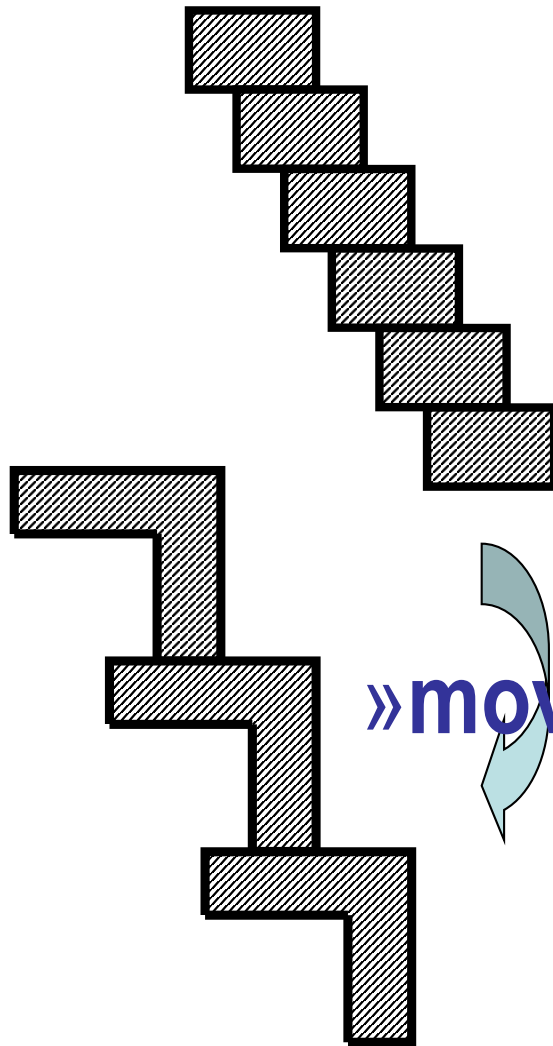
Design einer Schule



Petra (student):

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Design move



Petra beschreibt einen »move«

- beginnend mit 6 Klassenräumen
“too small”
- ändert in L-Formen
“more significant layout”

»move« = verändert Konfiguration

- ↳ ändern der Konfiguration
- ↳ Tätigkeit zeichnen

Design process

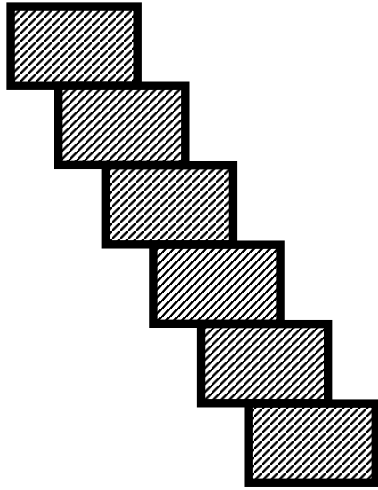
see



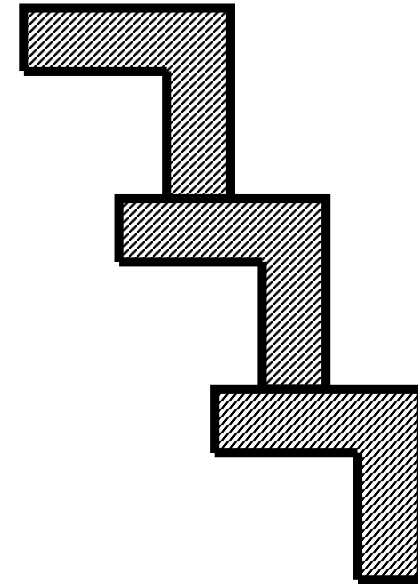
move



see



P: I had six of these classroom units but they were **too small** in scale to do much with. So I changed them to this **more significant** layout



move beginnt mit bestimmter

➤ Sicht der Konfiguration als

“six of these classroom units”

➤ Sicht enthält **Beurteilung** -

visual judgment:

“too small in scale to do much with”

↳ **sets a problem**

→ **move**
to solve problem

ändert Konfiguration in
L-Form (Problemlösung)

sieht ≈ beurteilt:

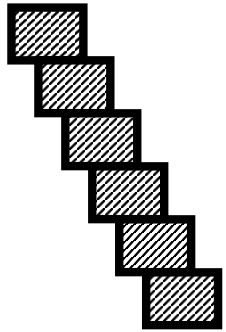
“this more significant layout”
(Sub-problem solved)

Design process

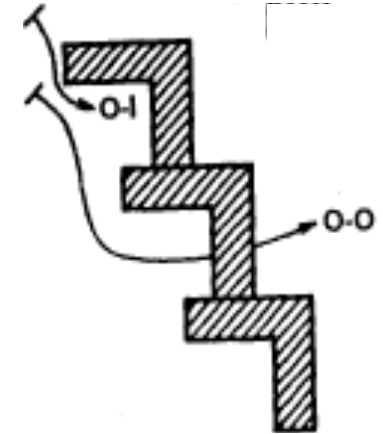
see



move



P: six classroom units
... **too small** in scale



kinds of seeing

- **Sehen als Figur**
- **Sehen dass** – beurteilt

Fähigkeit: erkennen, beurteilen
von Qualität; Bedeutung
»im Kontext un/passend«
“**appreciative systems**”

Design-Orientierung
problem-setting/-framing



entsteht im Designprozess
- nicht (vollständig) am Beginn!
»zielgenerierend«
- ist ein Ergebnis von Designing

appreciative systems

Designing erfordert normative, qualitative Beurteilungen Ein-Schätzung - “appreciations”

➤ »appreciative systems« \approx Werte, Normen...

- Fähigkeit (Kunstfertigkeit, Können) von Designern
 - erkennen von Qualitäten (z.B. einer Konfiguration von Räumen)
 - \approx »tacit knowing« = Beurteilungsbasis,
 - Beurteilungskriterien implizit: ‘im Kontext passend’ (\neq Regeln)
 - subjektiv
- gibt Orientierung
- design community

Appreciations are expressed in acts of judgment that we are able to make, tacitly, without necessarily being able to state the criteria on the basis of which we make them.

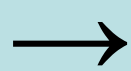
We can recognize and describe deviations from a norm much more clearly than we can describe the norm itself. (Vickers: The Art of Judgment)

Our **ability to recognize qualities** of a spatial configuration **does not depend on being able to give** a symbolic description of the **rules**.

We need only recognize when something is mismatched to a given context.

≈ Bs. **Sprache**: grammatisch richtigen / falschen Satz erkennen
(ohne Regeln der Grammatik kennen zu müssen)

Design process



move

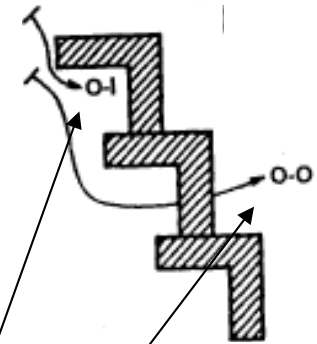


see



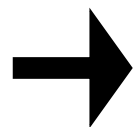
move experiment

P: "So I changed them to this **more significant layout**. It relates one to two, three to four, and five to six grades which is more what I wanted to do **educationally** anyway. What I have here is a space which is more of a **home base**. I'll have an **outside/inside** which can be used and an **outside/outside** which can be used"



Intention

= Formänderung



move

sehen,
entdecken

intendierte
Konsequenz

„more significant **layout**“

nicht-intendierte
Konsequenzen

- ↳ **educationally**
- ↳ **home base**
- ↳ 2 **Arten von Räumen**

verschiedene
domains

appreciative systems

move experiment ist bestätigt wenn

- **intendierte Konsequenzen erreicht u.**
- **nicht-intendierte Konsequ. erwünscht**

Design Ziele

“Drawing on ideas of appreciative systems, we can reformulate Petra's move experiment.

... on the basis of her initial **appreciation** (six small classrooms), she formed the intention of changing them to a more significant layout.

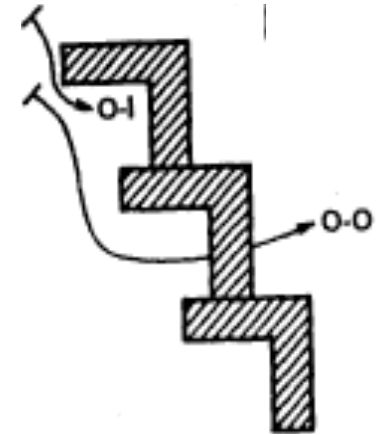
She then made her move and **discovered, through** her **appreciation** of the new configuration, that she had realized her intention. ... her move was affirmed.

... her **intention was not fully established at the beginning** of her design process, but evolved through her appreciation of an intermediate design product. (beachte Rolle von Zeichnungen)

Her intention developed in 'conversation' with the process by which she transformed her design. An evolving intention is one of the outputs of her designing.” (Schön & Wiggins: Kinds of seeing...)

(Vgl. ing.wiss. Vorgehensmodelle)

kinds of seeing



Designer arbeiten in Medien, z.B. Zeichnung

↳ **sehen** entstehendes Produkt ihrer Arbeit

- visuell wahrnehmen
- sehen als - Gestalt (bestimmt Elemente u. Relationen)
- sehen dass - qualitativ beurteilen einer Konfiguration
(→ problem setting)
- sehen - entdecken unintendierter Konsequenzen;
bemerken von Qualitäten, Eigenschaften,
Besonderheiten (auch ohne Kriterien angeben zu können)

Designing as interaction / move experiment

- ↳ Qualitative Beurteilung (appreciation) einer Konfiguration
 - ↳ führt zu Problemstellung bzw. Ziel und
 - ↳ move (verändert die Konfiguration)
- ↳ beurteilen der geänderten Situation (see; appreciation)
- ↳ entdecken (nicht intendierter Konsequenzen)

conversational structure of designing is a means of harnessing our remarkable ability to recognize more in the consequences of our moves than we have anticipated or described ahead of time.

domains

intendierte Qualität (im Bs.:)

→ Form: Relationen räumlicher Konfigurationen - 'significant scale'

nicht-intendierte Qualität (im Bs.:)

→ Gefühls-Qualität eines Platzes für Benutzer- 'home base'

→ Relation von Form und Nutzung - 'outside/inside'

→ Bedeutung der Räume für Schule - 'L-shapes relate grade one to grade two'

→ weitere domains: Gebäudeart, Technologie, Vorbilder, Kosten, etc.

ein move → Konsequenzen in verschiedenen domains

↳ **Komplexität**

verschiedene 'domains'

Bewältigen von Komplexität

- move in einer design domain - z.B. Form
glz. berücksichtigen aller domains ist zu komplex
- entdecken von Konsequenzen auch in anderen domains

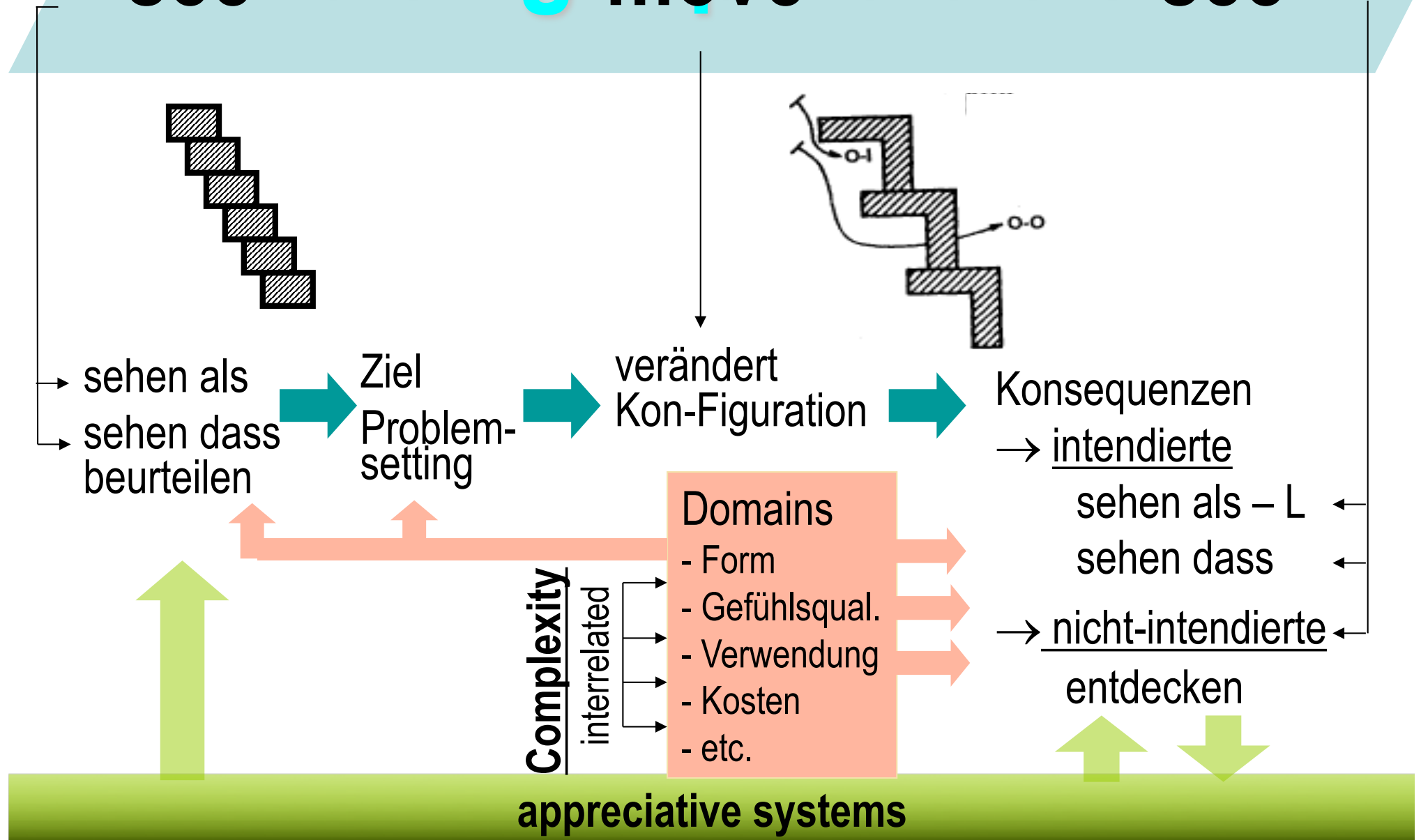
Bs.: Petra beginnt in der domain Form 'significant scale' und erst als sie die veränderte Form 'L-shapes' sieht, entdeckt sie Konsequenzen, Qualitäten in anderen domains

Bewältigung von Komplexität = see – move – see
conversational structur



Designing as interaction / conversational structure

see → **Designprocess** → move → see



Erfahrung

mature architect can work **simultaneously in many domains** ... 'siting', 'cost', 'construction technology', 'building character', etc. imagining how possible moves may affect all of them.

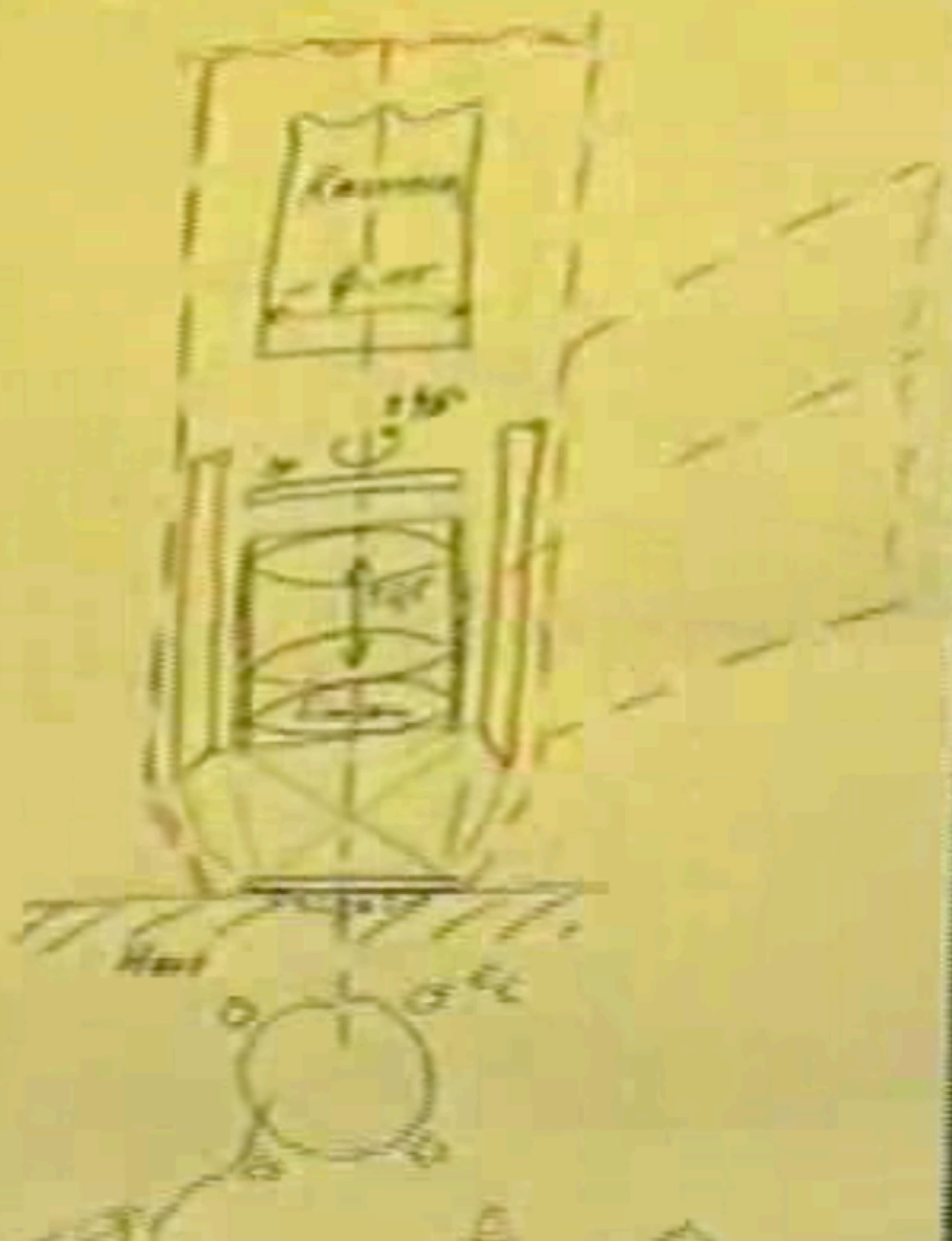
Petra herself, when she has completed this design project, will have developed a better '**feeling**' for the **possible interactions of design domains** - a **better understanding**, for example, of the ways in which particular kinds of school building configurations may lend themselves to certain kinds of uses while constraining others, produce or exclude certain kinds of usable spaces, suggest or inhibit certain feelingful qualities.

If this is so, we can see her **designing as a cumulative process** of discovery whose **output** is not only an elaborated intention but an **enriched understanding of relationships among moves**, consequences and qualities across multiple domains. And to the extent that Petra is able to see her next project as a variant of this one ... then she may be able to work from the very beginning of that project across several domains at once

see → move → see → move → se

Designing – wiederholte, kumulative »move experiments«

- ↳ verstehen einer (problematischen) Design-Situation
- ↳ designing serves as preparation for further designing
(in Projekten und darüber hinaus)



Beispiel aus Fallstudie

Optik-Verstellung - »move experiment«

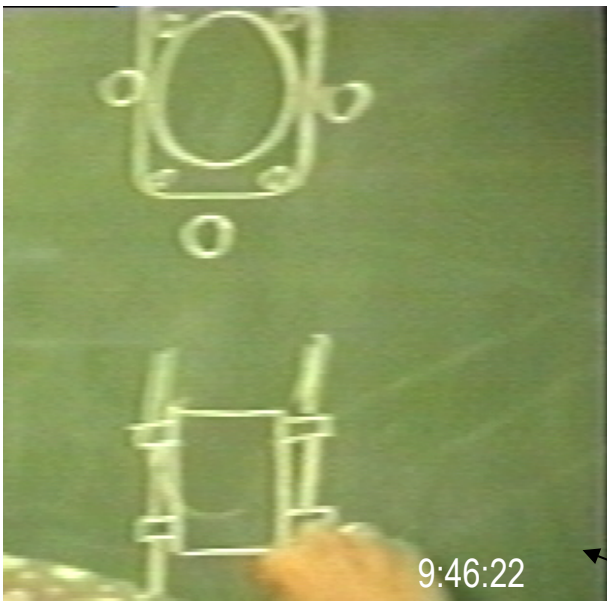


(A Do muaß i **die L- Linse** auf jeden Foi in a **in a Fassung bringen** (('zeigt' die Fassung)) **die gleitet**.
(8) (('geht zur Tafel)) **wos is, waunn i do jetzt zum Beispü so** (('zeichnet)) daß i do Führungen hob, wo des beweglich und do hab i die Lichtleiter () des von obn dann (.) so stehende **Führungsstangerln** hob (('Bild)) Daß i die Linse do einkleb (('uv)) in des in des Gehäuse.

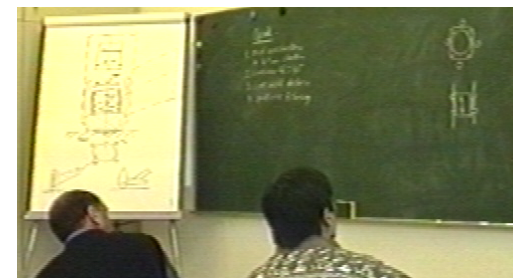
((setzt sich, beide sehen die Zeichnung an))

B Is ma schon klar.

A des sind aber man- des san daunn **Welln mit zwa Millimeter** (('lacht))



move → see / judge



»move experiment«

Optikverstellung

(203)

A gibt's do was Einfochs? (8) ((sieht auf Zeichnung)) Oder i tua's in a Buchse, und moch an Schlitz, ((geht zur Tafel)) a so so so so (.) ... ((zeichnet))

im Schnitt schaut des dann so, so a Gleitführung ((schraffiert die Führung, Bild)) und do hob i hoit irgendwo an Schlitz, zwa Millimeter wo i dann aussageh ((zeichnet)) zum Bewegn. Des eckt daunn.

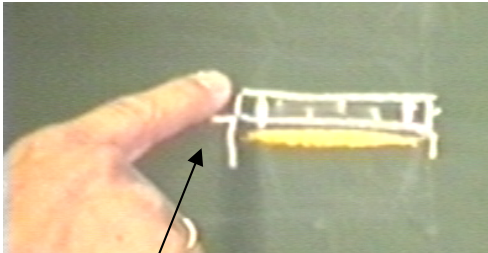
move → see / discover unintended consequence



Bewältigung von Komplexität

sukzessives Arbeiten in domains

Entwurf - Lagerung des Polarisationsfilters

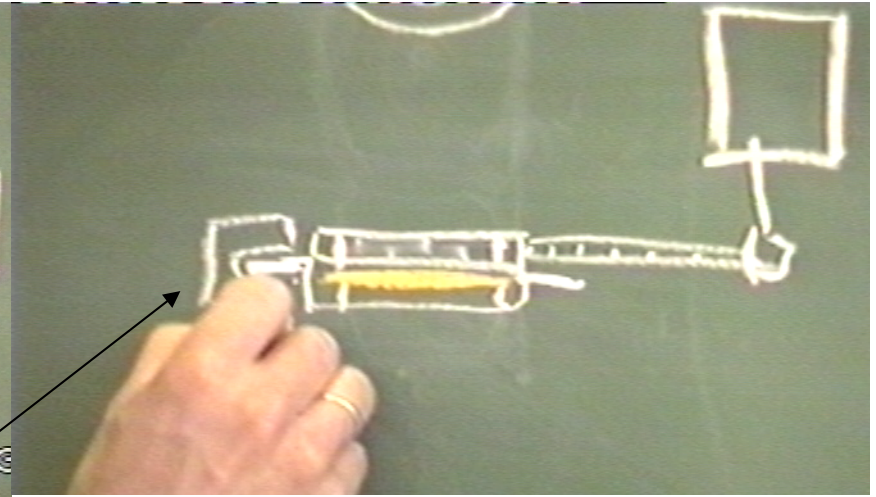
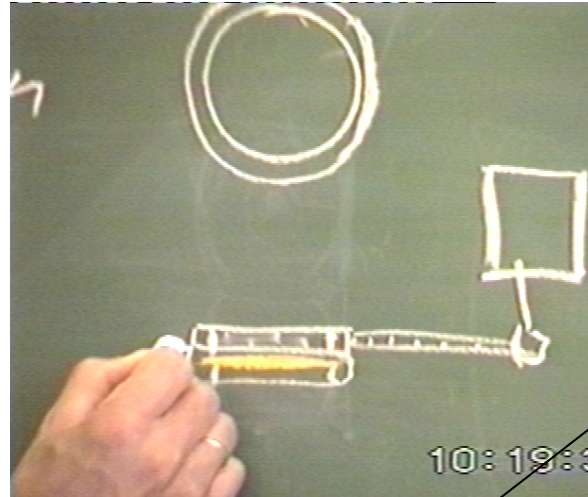


see → Ziel

B: 'eine Führung
mußt du auch noch
machen'.

Domain: **LAGERN**

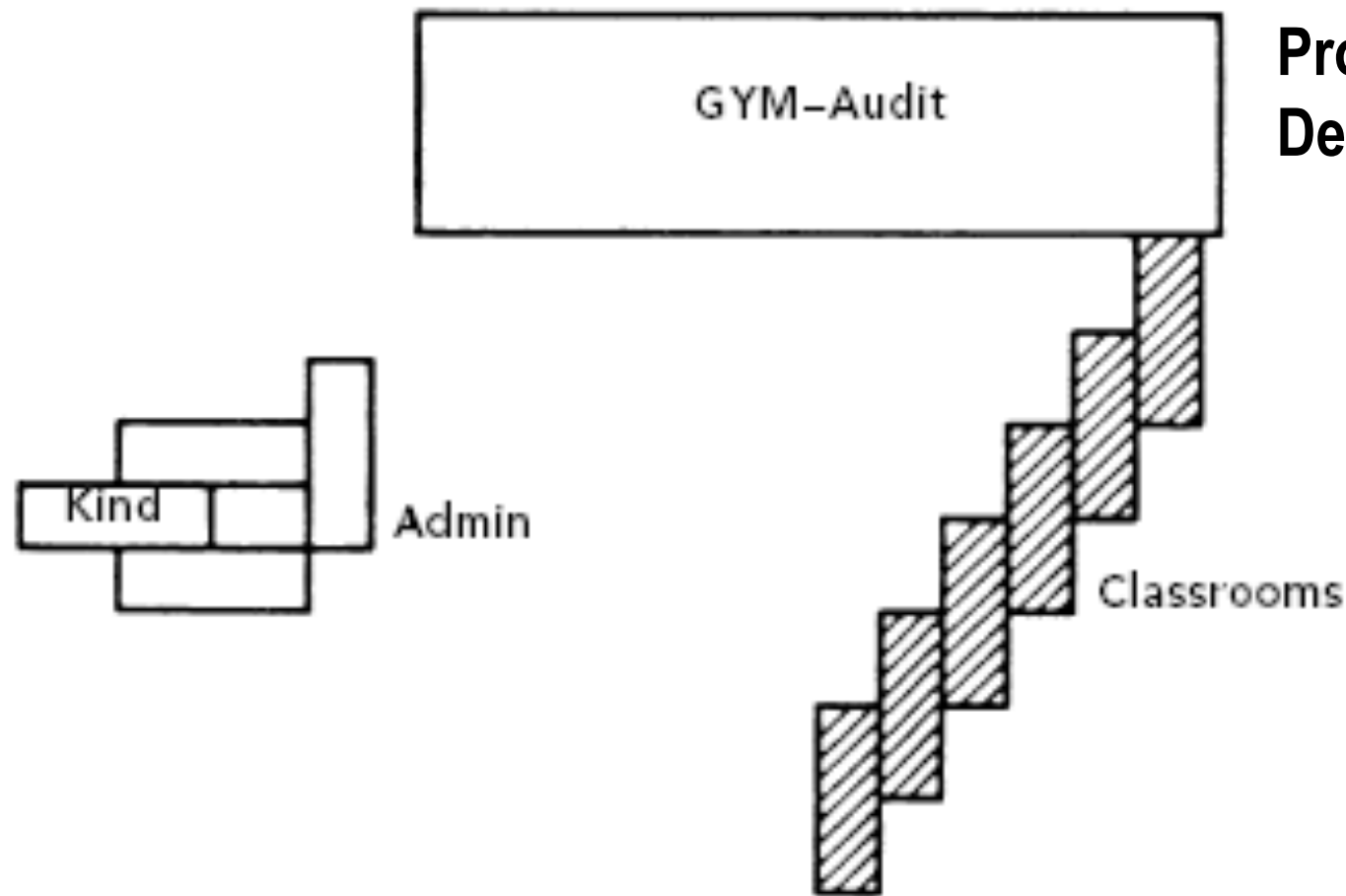
move - zeichnet eine Lagerschale



see - A: 'Aber wie ... zusammenbauen'

move - B: 'trennen, den Teil'

Domain: **MONTAGE**

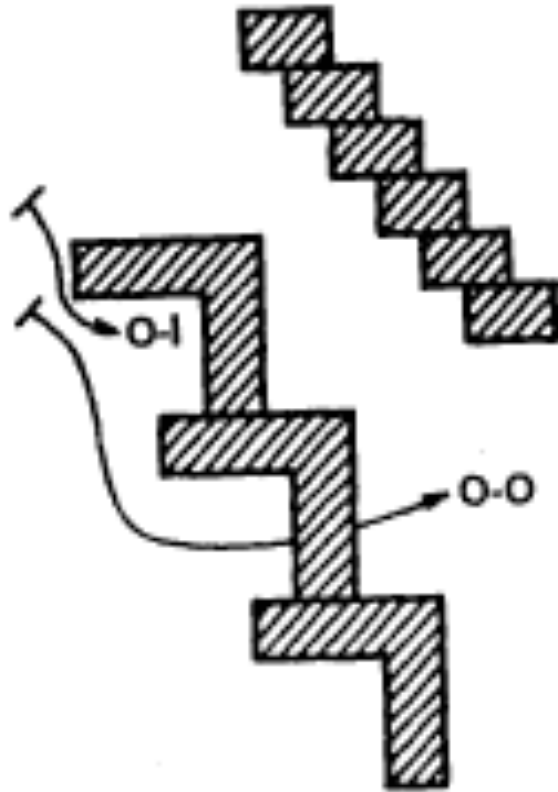


Projekt (review)
Design einer Schule

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I've tried to butt the shape of the building into the contours of the land
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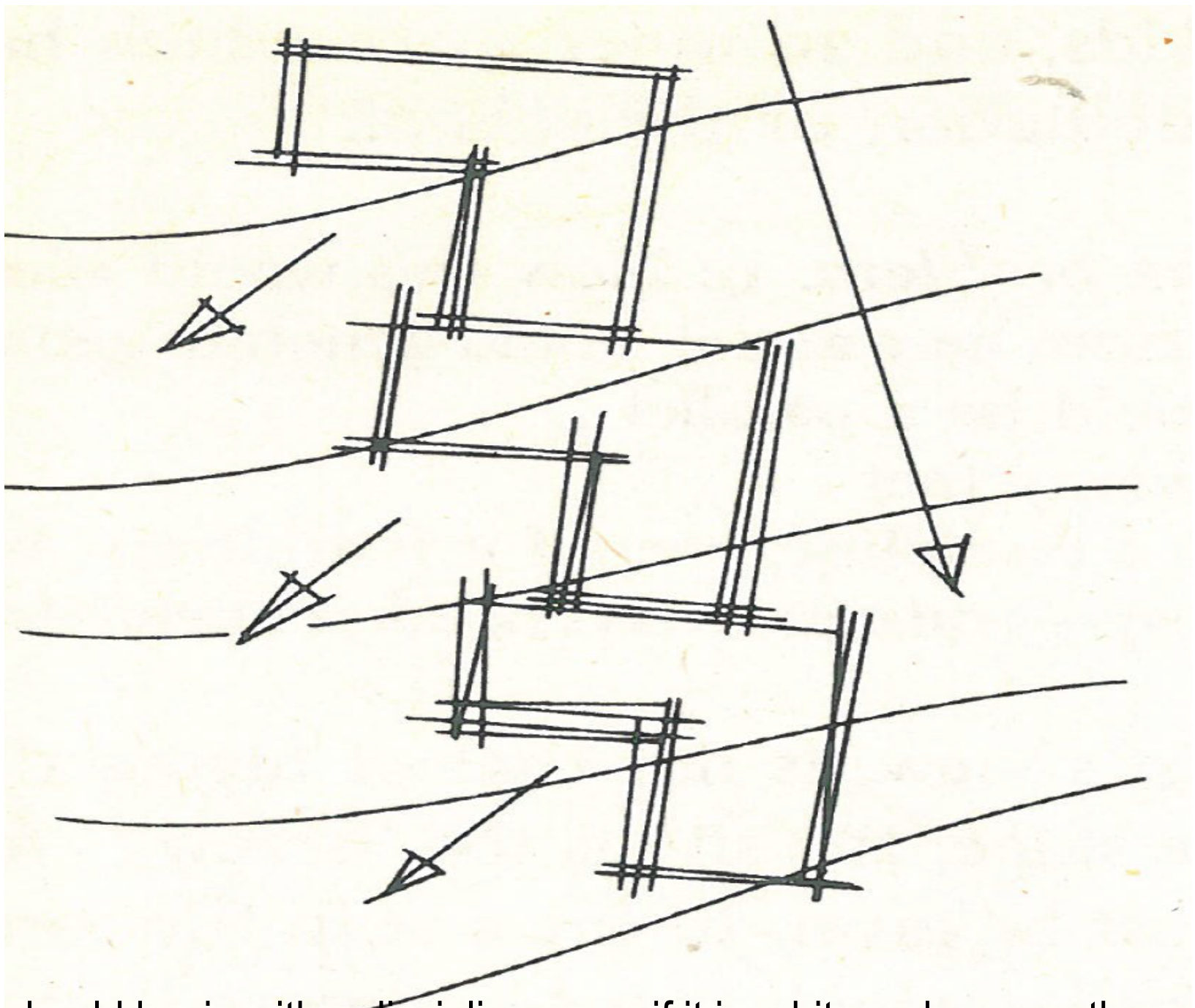
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problem (re-)framing

P's **ungelöstes Problem**

Petra: I am having trouble getting past the diagrammatic phase

I've tried to butt the shape of the building into the contours of the land there - but the shape doesn't fit into the slope. ...

↳ **problem-framing**: Gebäudeform der Landschaft anpassen

Quist's **reframing** of the problem

Q: You should begin with a discipline, even if it is arbitrary, because the site is so screwy - you can always break it open later.

↳ dem Gelände eine 'discipline' (Geometrie), Ordnung auferlegen

Problem Framing

Designers are not limited to 'given' problems, but find and formulate problems within the broad context of the design brief.

= **Problem setting** (> Problemklärung) is the process in which, interactively, we **name** the things to which we will attend and **frame** the context in which we will attend to them. (naming, framing)

“In order **to formulate a design problem** to be solved, the designer must **frame a problematic design situation**:

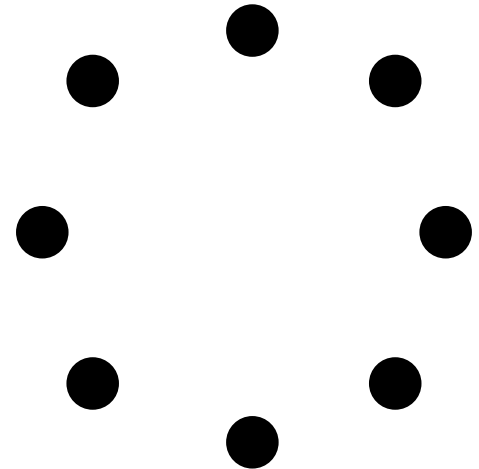
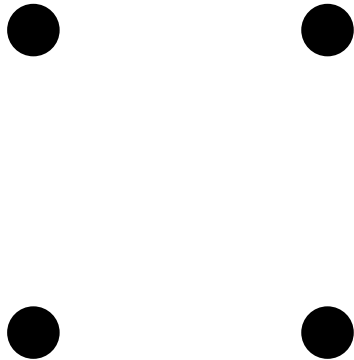
set its boundaries,

select particular things and relations for attention, and

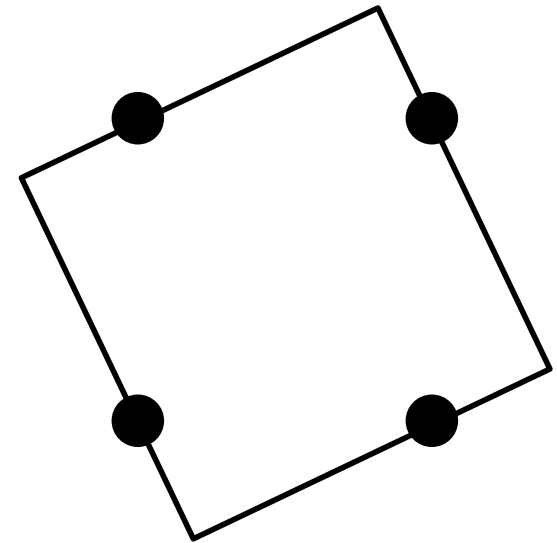
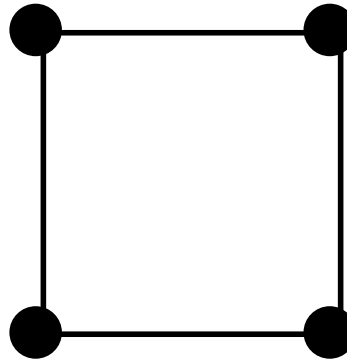
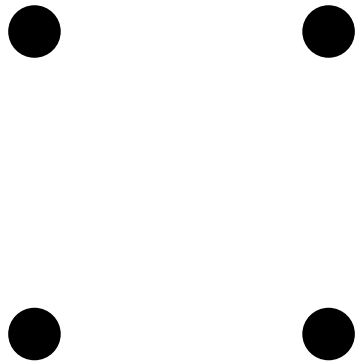
impose on the situation a coherence that guides subsequent moves.”

(Schön, D.: The Reflective Practitioner. 1983)

Gestalt



Gestalt



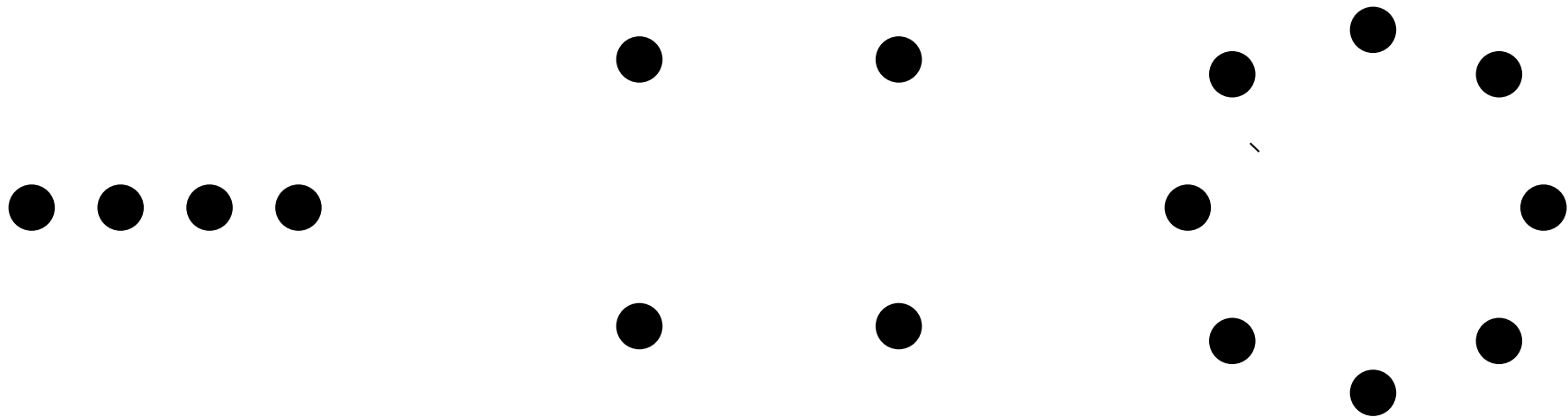
visuelle Wahrnehmung

„Jedes Reizmuster strebt danach, so gesehen zu werden, dass die sich die ergebende Struktur so einfach ist, wie es die gegebenen Umstände zulassen.“ (Arnheim, 2000: Kunst & Sehen. S.57)

Gestalt

Es gibt Zusammenhänge, bei denen nicht, was im Ganzen geschieht, sich daraus herleitet, wie die einzelnen Stücke sind und sich zusammensetzen, sondern umgekehrt, wo sich das, was an einem Teil dieses Ganzen geschieht, bestimmt von inneren Strukturgesetzen dieses seines Ganzen. (Wertheimer)

Gestalt



- **Gestalt** = erfassen **ganzheitlicher** Strukturen
≠ aufspüren unabhängiger Merkmale
- Details, Merkmale ≠ neutral
 - ↳ Aussehen, Bedeutung - von Wahrnehmung des Ganzen best.
- Gestalt bestimmt, was zu Elementen zählt, die sie anordnet
- Teile \Leftrightarrow Ganzes (wechselseitig abhängig) Bs. Rhythmus, Melodie
- Gestalt = An-ordnung, Organisation der Teile
- **Das Ganze ist mehr als die Summe seiner Teile.**

Gestalt

= ein **Ganzes** mit den **Eigenschaften**: (\neq Definition)

➤ **Übersummativität**

„**Das Ganze ist mehr als die Summe seiner Teile**“ (Aristoteles)

≈ **Emergenz**: spontane Herausbildung von Phänomenen oder Strukturen auf der Makroebene eines Systems auf der Grundlage des Zusammenspiels seiner Elemente. Die emergenten Eigenschaften des Systems lassen sich nicht auf Eigenschaften der Elemente zurückführen, die diese isoliert aufweisen.

➤ **Transponierbarkeit** (z.B. einer Melodie in eine andere Tonart; Rythmus)

Gestalt

»Das Ganze ist mehr als die Summe seiner Teile.«

ist nicht zutreffend

es muß heißen:

“Das Ganze ist etwas anderes als die Summe seiner Teile.

Es kommen nicht etwa nur zu den - unveränderten - Teilen

Gestaltqualitäten hinzu, sondern

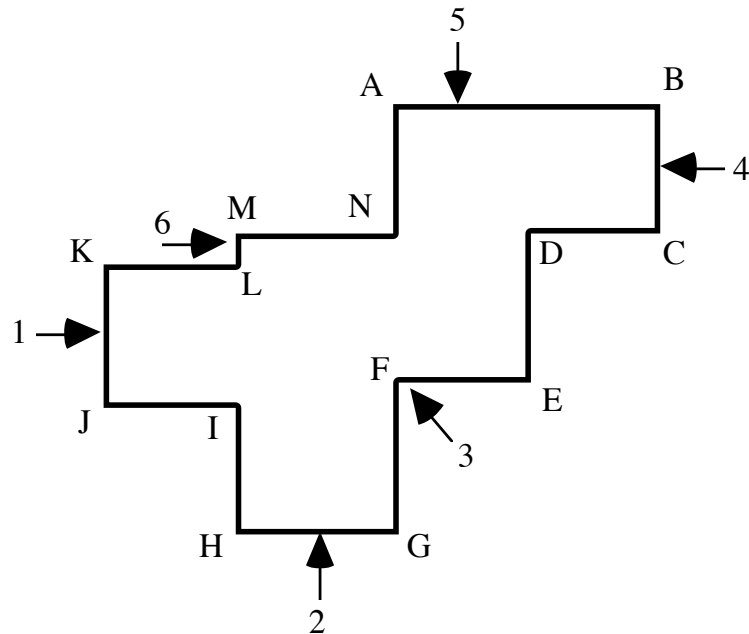
alles, was zu einem Teil eines Ganzen wird, nimmt selbst neue
Eigenschaften an.”

(Metzger 1975, Was ist Gestalttheorie?)



Donald Schön
(1930-1997)

'Sehen-als' Gestalt im Designing



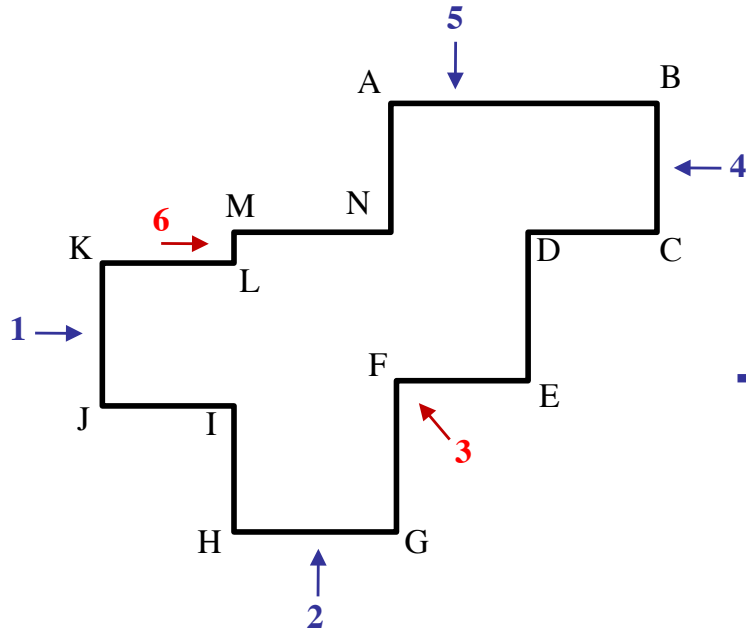
Bs. Bibliothekseingänge

gegeben: Grundfläche für Bibliotheken

Problemstellung: Implikationen der
Eingänge 1...6

'lautes Denken'

Gestalt-sehen im Designing



(1) Architekt
sieht, beur-teilt Eingänge in

→ Endeingänge 1, 2, 4, 5

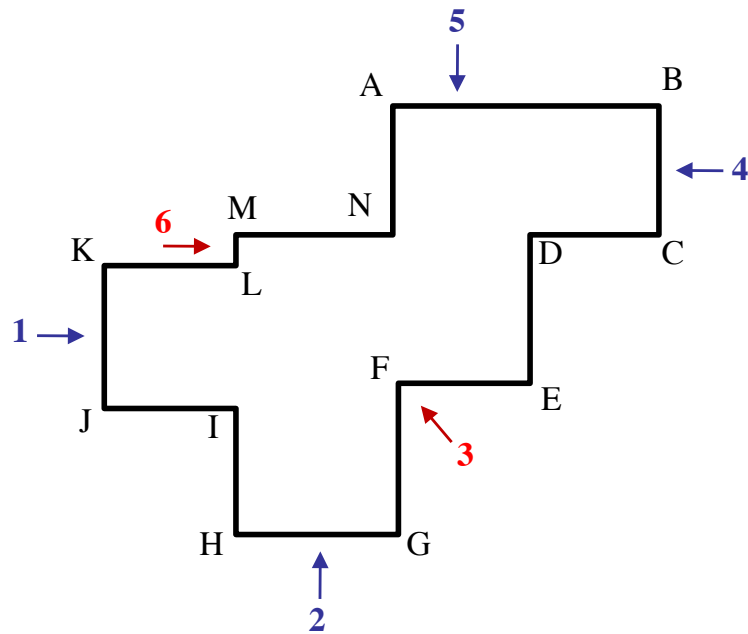
“coming in at the end makes a simple building“

→ Mitteneingänge 3, 6

“more difficult, more interesting, poetic“

→ Designer **sieht** Grundfläche **als** Figur mit Mitte und Enden

Gestalt-sehen im Designing



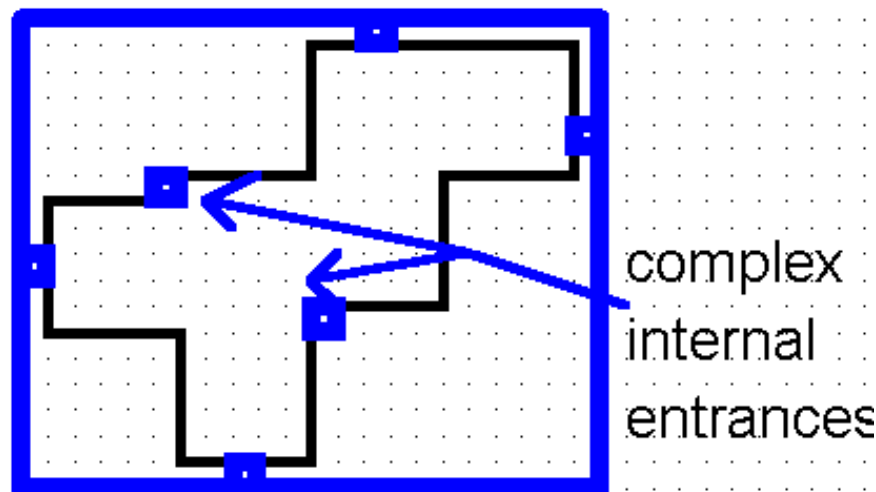
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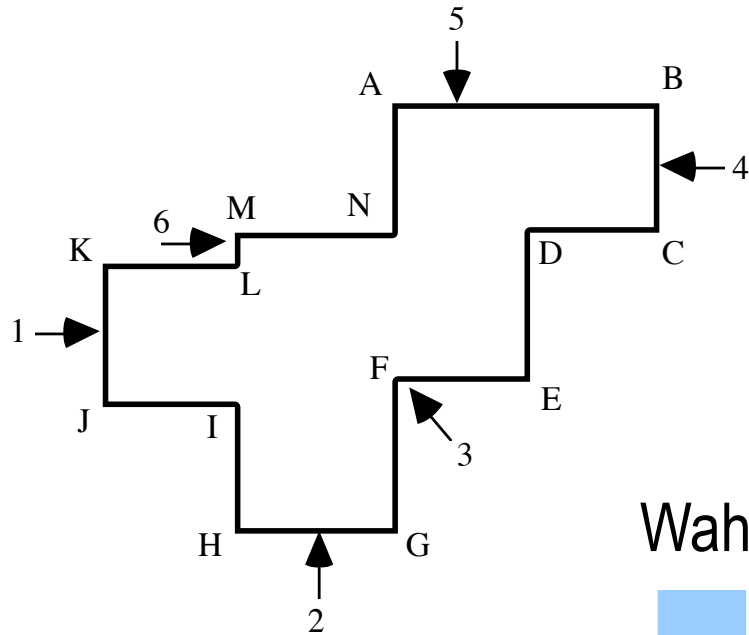
→ **Mitteneingänge 3, 6**

“more difficult, more interesting, poetic”



→ Designer **sieht** Grundfläche als Figur mit Mitte und Enden

Gestalt-sehen im Designing



(2) Designer **sieht** Grundfläche **als**

‘Mitte mit drei Ausbuchtungen’

= Teile (konstitutive Elemente) einer Figur
(≠ Linien, Winkel)

Wahrgenommene Figur

führt zu

Problemstellung & reasoning

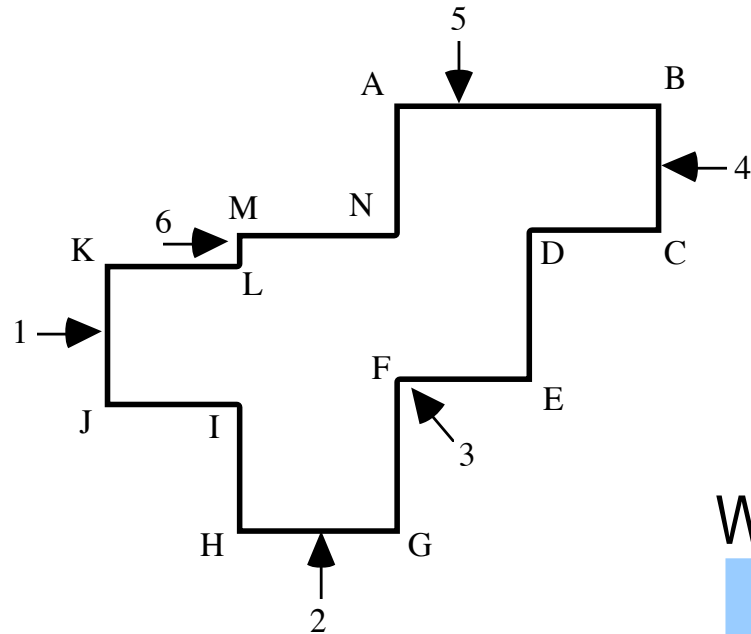
‘Kontinuität zwischen Mitte u.

Ausbuchtungen’

“The pods tend to break off and become
discontinuous with that middle.”

figure holds until he becomes aware of it → he considers other ways of reading

Gestalt-sehen im Designing



(2) Designer **sieht** Grundfläche **als**

‘Mitte mit drei Ausbuchtungen’

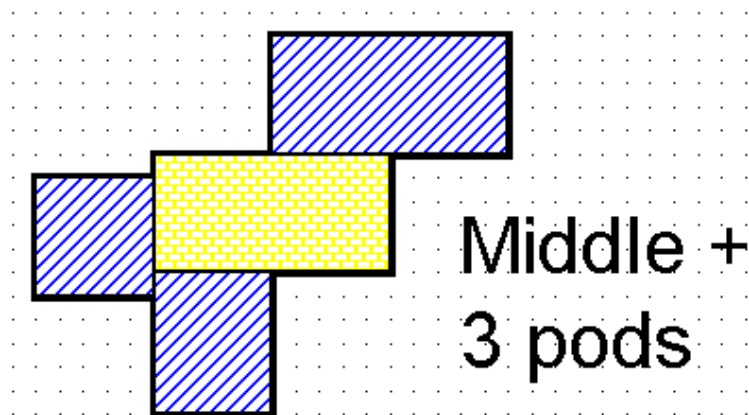
= Teile (konstitutive Elemente) einer Figur
(≠ Linien, Winkel)

Wahrgenommene Figur



Problemstellung & reasoning
‘Kontinuität zwischen Mitte u.
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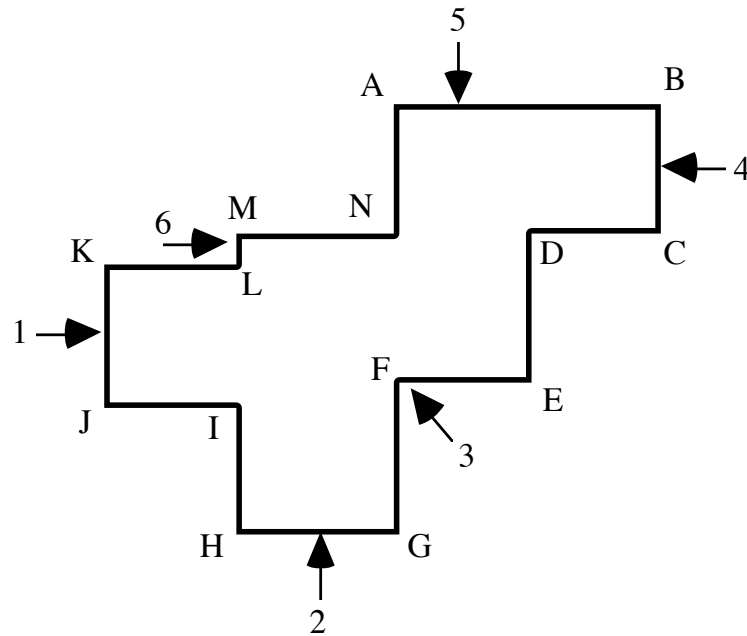
“The **pods tend to break off** and become
discontinuous with that middle.”



Middle +
3 pods

figure holds until he becomes aware of it → he considers other ways of reading

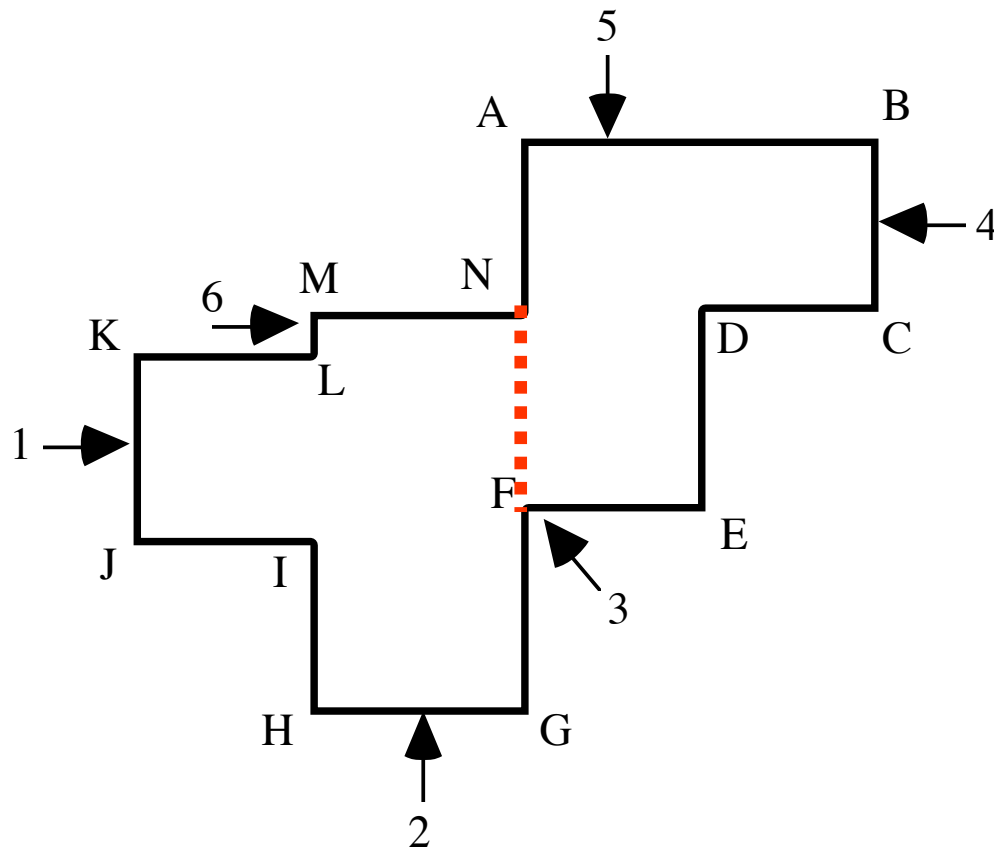
Gestalt-sehen im Designing



Fläche **sehen als**
(1) Mitte und Enden
(2) Middle & pods

- Such **figures** are **not** often **explicitly** invoked.
- Designers seem to **lock into them** - quickly – and
- then **work from them**, explicitly referring to
- **problems constructed on the basis of figures** that are perceived but not explicitly described.

Gestalt-sehen - problem-setting



(2) Designer

his figure holds until he becomes aware of it

↳ he **re-interpretes** the footprint

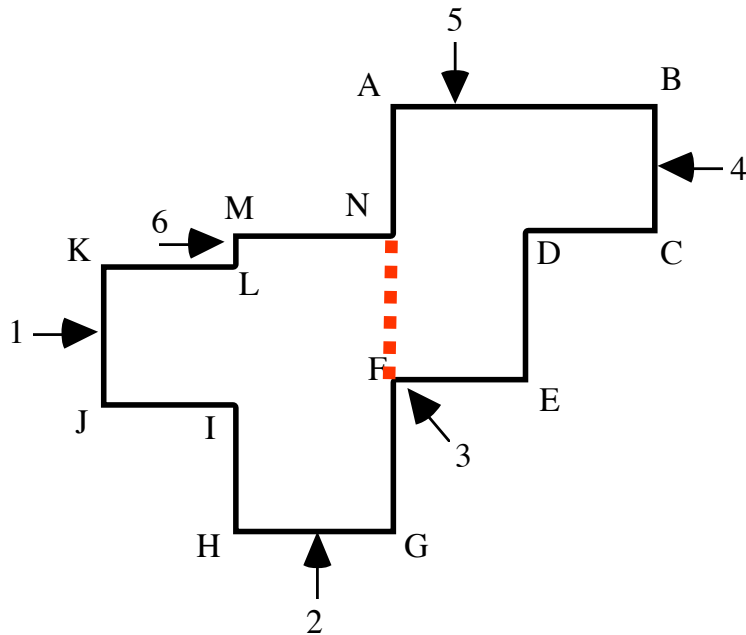
“two L’s back to back”

creativity

Seeing a new figure → sets a new problem

“If one thinks of the right-hand L as one big use space, one has to worry about the lack of any space to move in between the two of them”

Gestalt-sehen - problem-setting



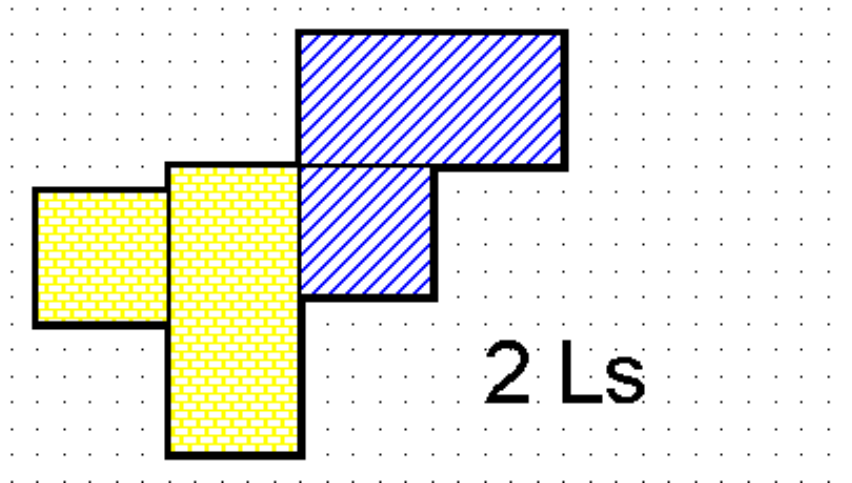
(2) Designer

his figure holds until he becomes aware of it:

“It seems reasonable to read it that way - three pods and a middle space”

↳ he **re-interpretes** the footprint

“**two L's back to back**” - creativity

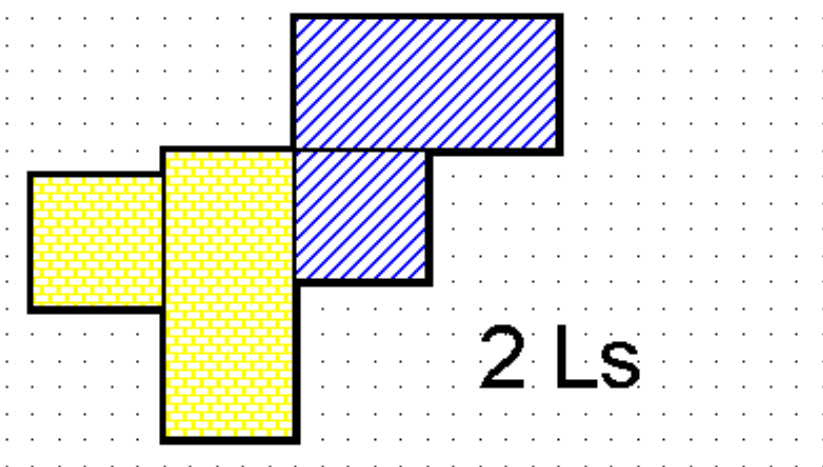
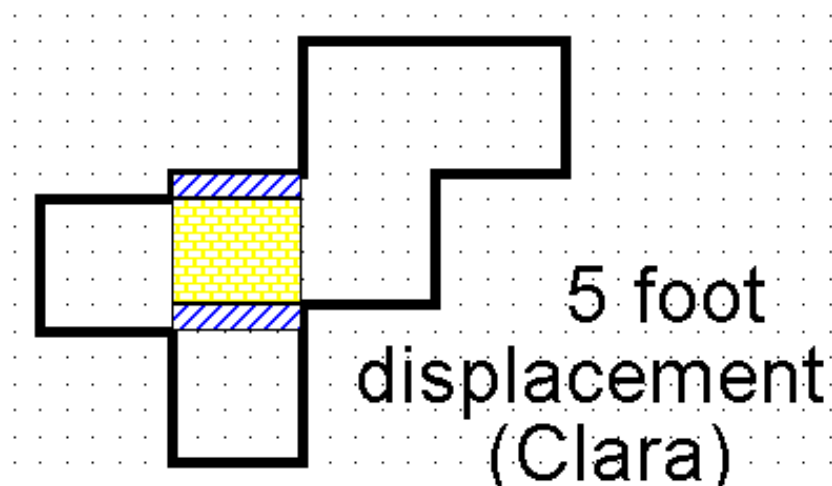
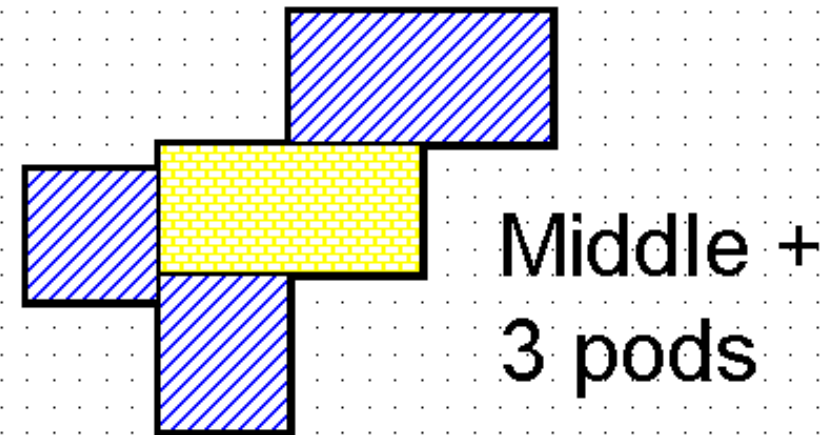
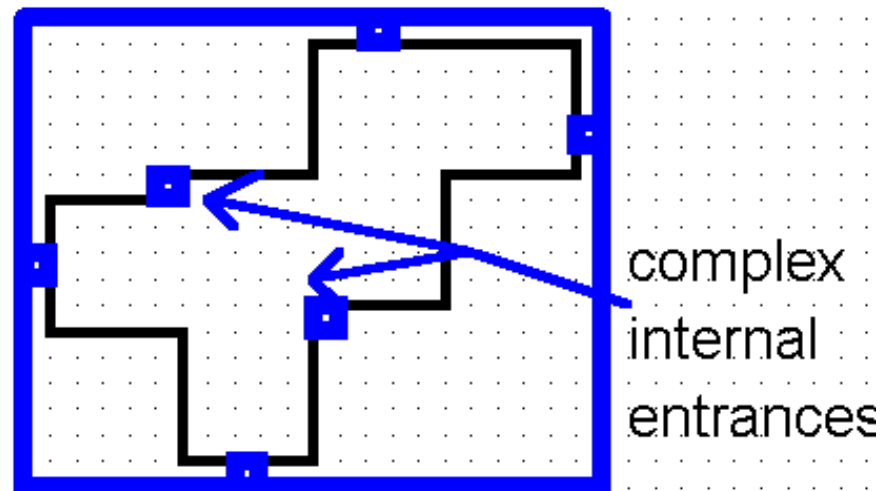


Seeing a new figure

↳ **sets a new problem**

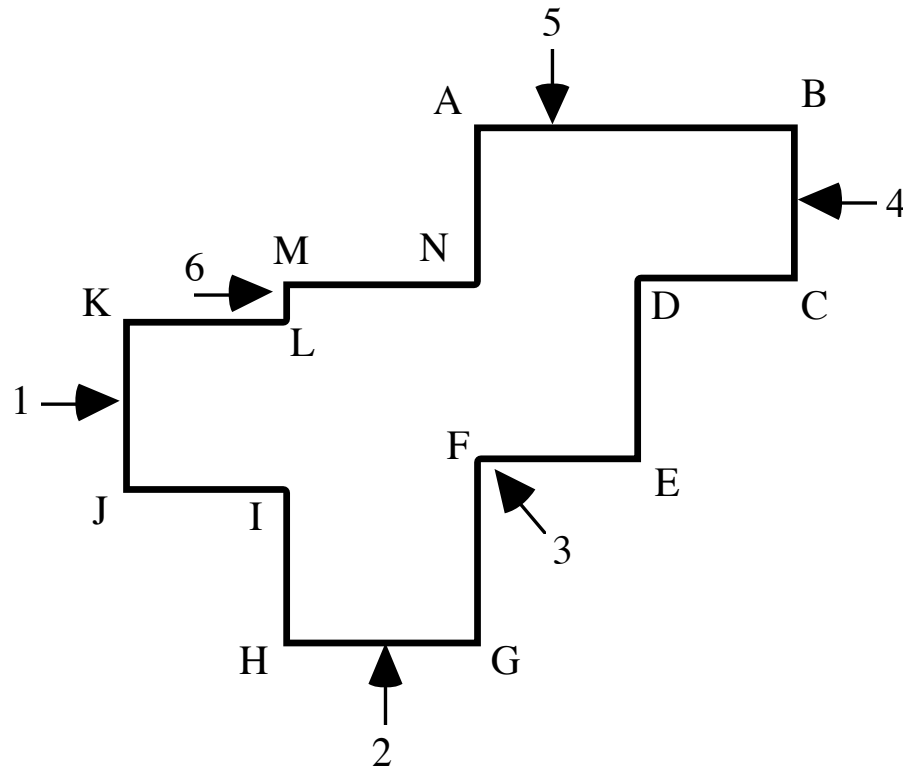
“If one thinks of the right-hand L as one big use space, one has to worry about the lack of any space to move in between the two of them”

each designer **saw** the footprint **as** a particular kind of **figure** linked to a particular way of **reasoning** about the task → **Interpretative Flexibilität**



For any **given set of marks**, different people, or same person at different times, may **construct different figures** ≈ versch. Interpretationen ≠ wahr / falsch

Gestalt-sehen - problem-setting



Fläche **sehen als**

(1) Mitte und Enden

(2) Middle & pods

(2a) 2 L-Formen

Seeing a new figure

↳ **sets a new problem**

For any **given set of marks** on a page,
different people, or
the same person at different times,
may **construct different figures**.

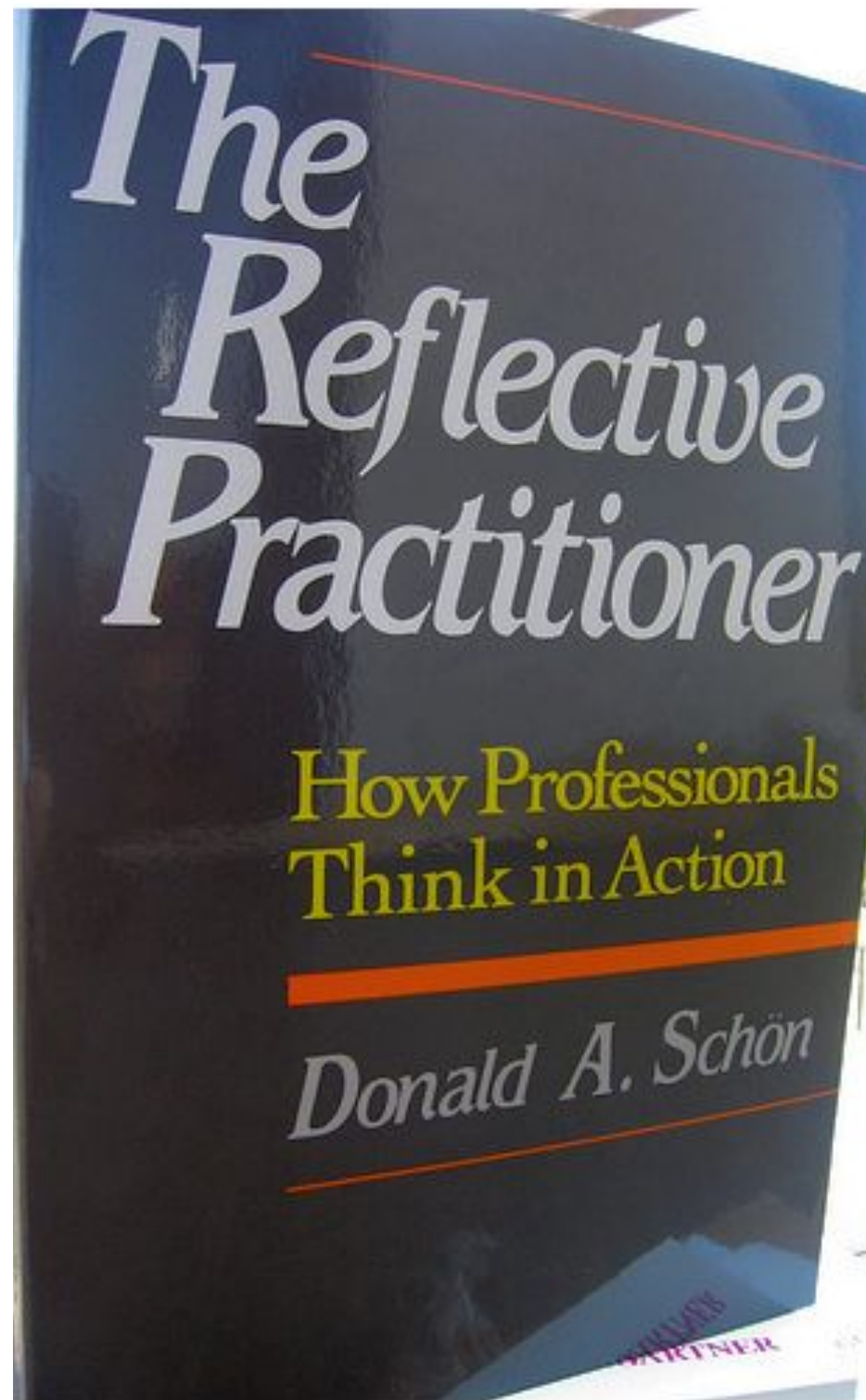
≈ versch. Interpretationen ≠ wahr / falsch → Interpretative Flexibilität

each designer

- **saw** the footprint **as** a particular kind of **figure**
- **linked to** a particular way of **thinking** about the task



Donald Schön
(1930-1997)



knowing-in-action

knowing-in-action has the following properties:

- There are **actions**, **recognitions**, and **judgments** which we know how to **carry out spontaneously**; we do not have to think about them prior to or during their performance.
- We are often unaware of having learned to do these things; we simply find ourselves doing them.
- In some cases, we were once aware of the understandings which were subsequently **internalized** in our feeling for the stuff of action. In other cases, we may never have been aware of them. In both cases, however, we are usually **unable to describe** the knowing which our action reveals.

In this sense ... **knowing-in-action** is the characteristic mode of ordinary **practical knowledge**.

(Schön: The Reflective Practitioner)

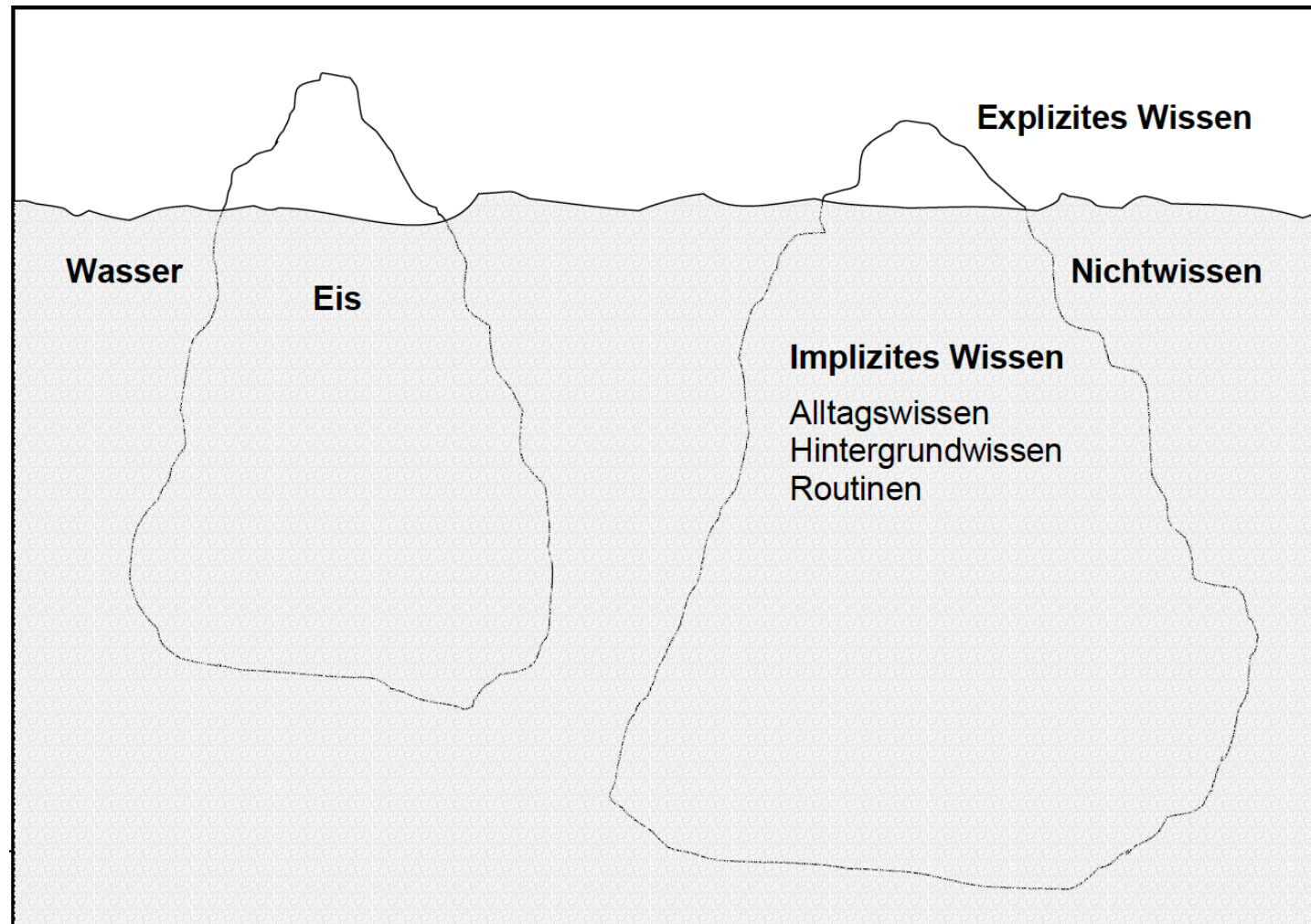
knowing in action

Design knowledge is knowing in action, revealed in and by actual designing. It is mainly tacit, in several senses of the word:

- designers know more than they can say,
- they tend to give inaccurate descriptions of what they know, and
- they can best (or only) gain access to their knowledge in action by putting themselves into the mode of doing, ...
 - (≈) a touch typist, who cannot say offhand just where all the letters are on the keyboard, can begin to type, even on an imaginary keyboard, ...

Schön: Designing as Reflective Conversation With the Materials of a Design Situation. Conference on Artificial Intelligence in Design 1991.

‘Eisberge’ des Psychischen unter der Oberfläche der Reflexion



Moldaschl: Blockaden und blinde Flecken betrieblicher Modernisierung. Eine kleine Erkenntnistheorie zum alltäglichen Scheitern. in: Puhl, B. (Hrsg.): Ganzheitliche Kompetenzentwicklung – Lernen von Menschen und Systemen. München & Mering: Hampp 2001, S. 99-121.

practice

professional **practice includes repetition.**

A professional practitioner is a specialist who encounters certain **types of situations** again and again - 'cases' or 'projects' ; such terms denote the units which make up a practice, and they denote types of 'family-resembling examples '

As a practitioner experiences many variations of a small number of types of cases, he develops a **repertoire of expectations, images, and techniques**. He **learns what to look for and how to respond** to what he finds. His **knowing-in-practice** tends to become increasingly **tacit, spontaneous, and automatic**, thereby conferring upon him and his clients the benefits of specialization.

On the other hand, professional **specialization** can have **negative effects**. In the individual, a high degree of specialization can lead to a narrowness of vision. The practitioner has "overlearned" what he knows

(Schön D.: The Reflective Practitioner. 1983)

Reflection in action

Sometimes, we think about what we are doing in the midst of performing an act. When performance leads to surprise - pleasant or unpleasant - the designer may respond by **reflection in action**: by **thinking about what she is doing while doing it**, in such a way as to influence further doing.

In architectural design, the "performer" frequently conducts an experiment in the form of a series of drawings.... He sketches, for example, how the forms of a building might be butted into the contours of a site. In this process, he may discover - to his surprise - that the contours work against the building's form. In response to this discovery, he may conclude that "the site is screwy," so it requires "imposing a geometry onto the contours." He may then invent such a geometry and overlay it onto his drawing of the contours. ... the **designer is reflecting in action**, both on the **phenomena** he is representing through his drawing and on his **previous way of thinking** about the design problem.

practitioner's reflection on action

as a **practice** becomes more repetitive and **routine**, and as knowing-in-practice becomes increasingly **tacit** and **spontaneous**, the practitioner may **miss** important **opportunities to think about** what he is doing.

A practitioner's reflection can serve as **a corrective to overlearning**.

Through reflection, he can surface and criticize the tacit understandings that have grown up around the repetitive experiences of a specialized practice, and can make new sense of the situations

A practitioner may **reflect on** the

- **tacit norms** and appreciations which underlie a judgment, or on
- **strategies** and theories implicit in a pattern of behavior
- **feeling** for a situation which has led to adopt a particular course of action
- the way in which he **has framed the problem** he is trying to solve, or on
- the **role** he has constructed for himself within a larger institutional context.

(Schön D.: The Reflective Practitioner. 1983)

Reflective Turn in Design Research

Descriptive research aims to describe the frameworks, habits of perceptions, use of tools, routines, and practices which serve as the background for interpretations in particular design processes.

Descriptive research aims to stimulate designer's "reflection on the understandings already built into the skillful actions of everyday practice." (Schön D.: The Reflective Turn. 1991, p. 5)

"Frame analysis may help practitioners to become aware of their tacit frames" (Schön D.: .: The Reflective Practitioner. 1983, p.311)

Research results may help designers to notice how "... they actively construct their reality of practice and become aware of the variety of frames available for them ..." (ibid.)