

Natural Social Science Interfaces

for GCE

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where we stopped

- Summary of the „change seminar“ (GK, MH)
 - What perceptions and relationships existed *in the past*, how were they related to decline and success of cultures?
 - e.g.: Why did Europe succeed?
- Starting point of the „interface seminar“ (TK, MH)
 - What perceptions and relationship exist *today* in different disciplines, how do they contribute to an understanding and solution of environmental problems (tasks)?
 - e.g.: Does Europe (Western culture) still succeed ?

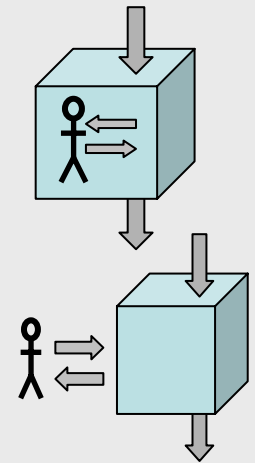
new starting point

from the natural science perspective

- Environmental problems start from (unexpected) practical urgencies, which
 - do not match the *practical* division of work
 - do not match the *academic* division of work
- Natural sciences are formally based
 - automated generation and arguing about (complex) systems
 - Living systems are special subjects of natural science
 - Methodological examples here:
 - dynamical systems, SOC, Networks, ...
 - Terminological examples:
 - Landscape, wilderness, ecosystem

which interfaces ?

- „Nature“– „Culture“ distinction lead to interfaces between:
 - **humans** and **their natural environment**
 - **humans** and **ecosystems** as a subject of ecology
 - **natural** and **cultural** sciences
- Interfaces are part of modelling perceptions
 - expressed in different meanings of “nature”



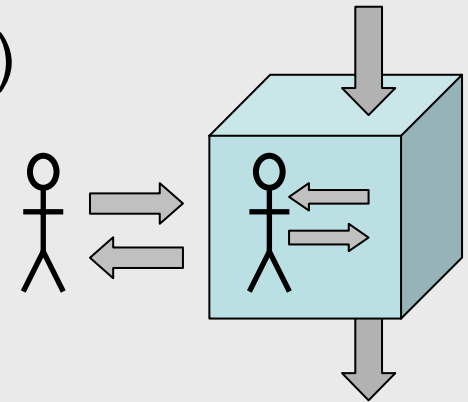
characterising the two model types of the environment

- Conceptualise as resource (human – system)

- State variables, capacities, conservation laws

- Recipe:

- Describe context of system by a map (space)
- Observe state once accurately
- Identify „true“ **dynamics**,
- it is a system

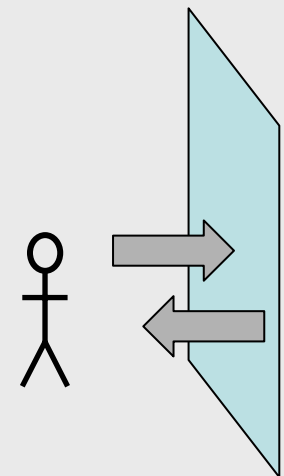


- Conceptualise as a task (human - interface)

- Situations, intensities, norms

- Recipe:

- Describe context of interface by a storyline (history)
- Document history comprehensively
- Identify „relevant“ strategies
- It effects us like an **interaction**



Landscape

- The word landscape comes from the Dutch word *landschap*, from *land* (directly equivalent to the English word land) also the suffix *-schap*, corresponding to the English suffix "-ship".
- *Landscape*, first recorded in 1598, was borrowed as a painters' term from Dutch during the 16th century, when Dutch artists were on the verge of becoming masters of the landscape art genre. The Dutch word *landschap* had earlier meant simply 'region, tract of land' but had acquired the artistic sense, which it brought over into English, of 'a picture depicting scenery on land'.

Landschaft

- Die Alexander von Humboldt zugesprochene Definition der Landschaft als „**Totalcharakter einer Erdgegend**“, wird in der Fachliteratur immer wieder pauschal erwähnt, ohne dass sie in Humboldts Schriften nachweisbar ist. Fassbar im geographischen Sinne ist der Begriff seit der Renaissance, während die Wortwurzel -schaft die frühere Bedeutung einer verfassten, organisatorischen Einheit nahelegt – in Unterscheidung zum Ausdruck Landstrich.

Perceptions of nature as: Landscape, wilderness, ecosystem

- These notions are at the centre of nature conservation and protection
 - Landscape: an aesthetical notion („das Schöne“)
 - Wilderness: a moral-practical notion („das Gute“)
 - Ecosystem: a theoretical notion („das Wahre“)
- Landscape as:
 - a (system) **state** to be maintained or
 - a spatially experienced object of development and configuration (Gestaltung)
 - „Man muss sogar fragen, ob man Landschaft überhaupt planen kann, oder ob sie ein zu *erhaltender* **Zustand** oder ein (räumlich erlebbares) Objekt von Entwicklung und Gestaltung ist.“
 - a **task** posed by an interface

Landscape and Interfaces

- The notion of landscape occurs in **both** modeling approaches
 - as a dynamic system:
 - a landscape consists of ...
 - as an interface:
 - a landscape poses a task to which one need to respond properly to ...

Landscape

in natural science

- Overlapp with (holistic) notions of ecosystems
 - Landscape composed of ecosystems
 - ecosystems as dynamic systems

Landscape

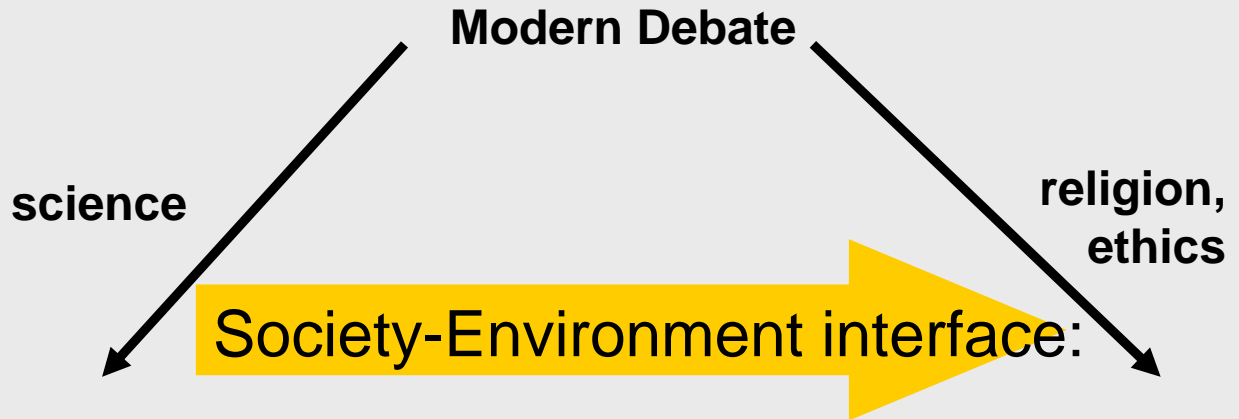
in landuse traditions (agriculture, forestry, ...)

- Based on aesthetic & practical notions of landscape
 - Landscape perceive as a bundle of tasks
 - tasks relate to interfaces

refreshing the summary

- The living environment includes three types of interactions:
 - **functional** (interaction with dynamical systems)
 - **bounded interaction**:
 - hierarchical
 - symmetrical
 - **open interaction**: wilderness
- Success of cultures classified by performance indices as
 - dynamic systems:
 - functional measures, e.g. efficiency
 - a value-loaden task:
 - interactive measures, e.g. robustness,
 - In computer science: safety & liveness

Categories for Classifying?



Societal interaction:

	Functional (physical drivers)	bounded Interaction (hierarchical)	bounded Interaction (symmetrical)	open Interaction
View at ecosystems	Ecosystem	Landscape		Wilderness,

Categories for Classifying?

Society-Environment interface:

Societal monitoring:

	Functional (physical drivers)	bounded Interaction (hierarchical)	bounded Interaction (symmetrical)
by functional measures actual efficiency	Carribbean oil gas resources (low) NZ Dairy farming * (high)	Greenland Vikings (low) Global Change?	
by interactive measures long-term robustness	Eastern Island (low) Egypt* (high)	Anasazi (low), Cahokia (low) Bali* (high)	Neolithic hunters and gatherers (high?) Greenland Inuit (high)*,

* no collapse (in the sense of lost collective identity)

Internal or external perspectives ?

- Evaluate change in meaning
 - internal: revolution (change in meaning), catastrophe, warfare, ...
 - external: Collapse (i.e. a breakdown of transmission in meaning)
- Monitor change
 - actual performance (input/output analysis)
 - How efficient are they using their resources ? (NZ Dairy)
 - How innovative is the use ?
 - How many natural resources are there?
 - Indicators compare spatially (globally) for efficiency (market is the valuator)
 - Long-term survival
 - How difficult it is to transmit the competence ?
 - How comprehensive is transmission
 - How complex and interesting is the natural environment?
 - Indicators compare (locally) for comprehensiveness (liveness and safety) (young vs. old)