

Systems Thinking and Management

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Forschungsseminar Co-operative planning and complex systems
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Structure

- Introduction
- What is a System ?
- What is Management?
- Analysis and Synthesis
- Problem solving
- Knowledge and Understanding
- Summary, Thoughts, Questions, Discussion



https://de.wikipedia.org/wiki/Russell_Ackoff#/media/Datei:Russel_Lincoln_Ackoff.jpg

**...the totality is not, as
it were, a mere heap,
but the whole is
something beside the
parts...**

--Aristoteles



Peter Holck, Bart Van Der Leck. portræt. 1998.

Reductionistic

Divide into
separate parts

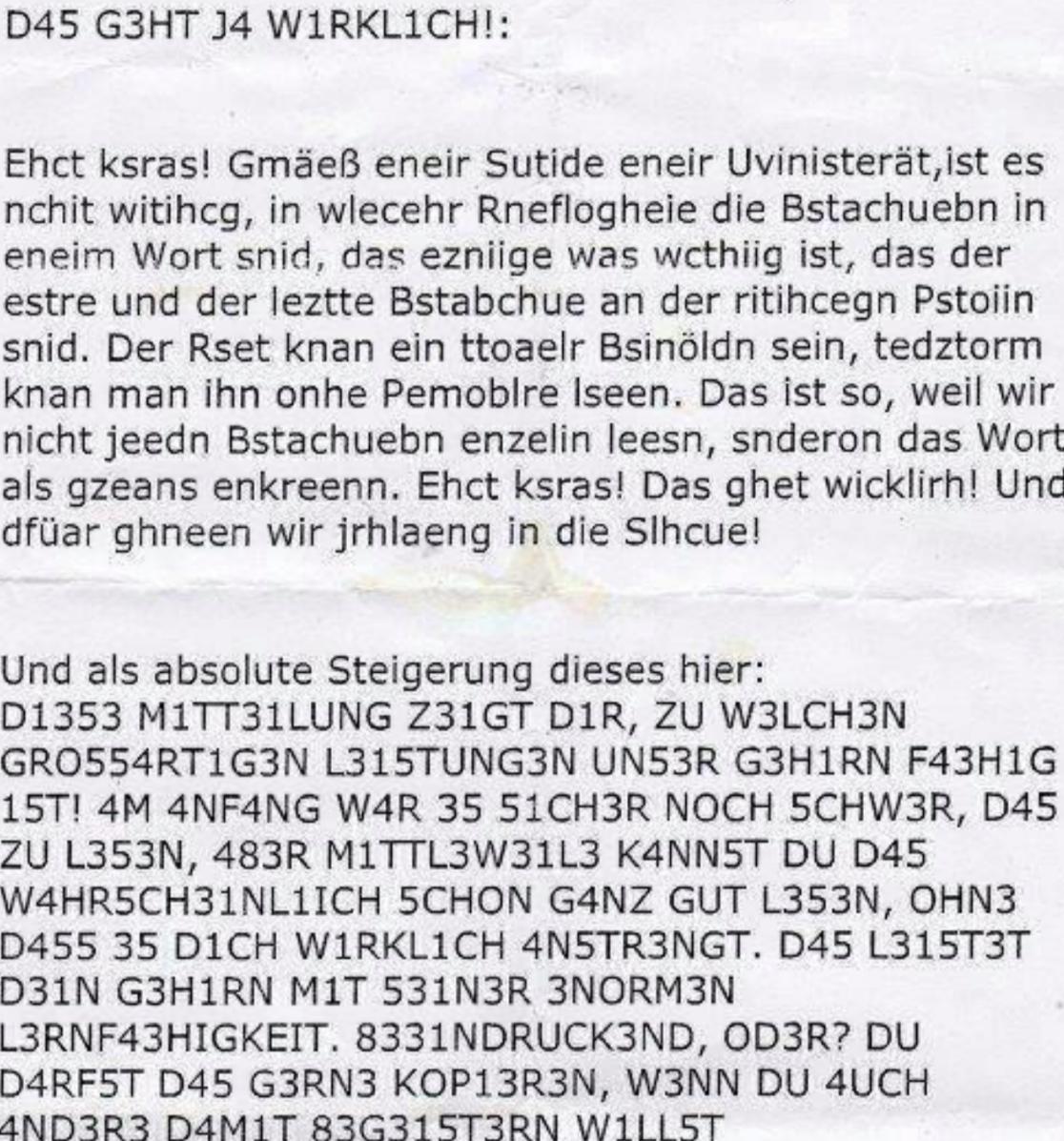


Holistic

- Understand the „whole“
- Making connections
- Look for associations

Das Gehirn

man kann es wirklich lesen!!!

D45 G3HT J4 W1RKL1CH!: 

Ehct ksras! Gmäeß eneir Sutide eneir Uvinisterät, ist es
nchit witihcg, in wlecehr Rneflogheie die Bstachuebn in
eneim Wort snid, das ezniige was wcthiig ist, das der
estre und der leztte Bstabchue an der ritihcegn Pstoiin
snid. Der Rset knan ein ttoaelr Bsinöldn sein, tedztorm
knan man ihn onhe Pemoblre lseen. Das ist so, weil wir
nicht jeedn Bstachuebn enzelin leesn, snderon das Wort
als gzeans enkreenn. Ehct ksras! Das ghet wicklirh! Und
dfür ghneen wir jrhlaeng in die Slhcue!

Und als absolute Steigerung dieses hier:

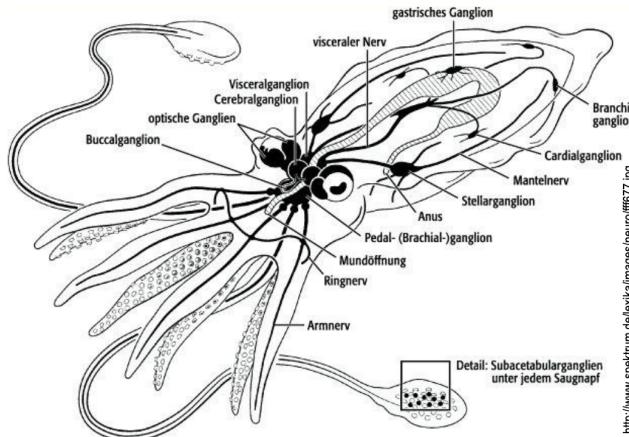
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GRO554RT1G3N L315TUNG3N UN53R G3H1RN F43H1G
15T! 4M 4NF4NG W4R 35 51CH3R NOCH 5CHW3R, D45
ZU L353N, 483R M1TTL3W31L3 K4NN5T DU D45
W4HR5CH31NL1ICH 5CHON G4NZ GUT L353N, OHN3
D455 35 D1CH W1RKL1CH 4N5TR3NGT. D45 L315T3T
D31N G3H1RN M1T 531N3R 3NORM3N
L3RNF43HIGKEIT. 8331NDRUCK3ND, OD3R? DU
D4RF5T D45 G3RN3 KOP13R3N, W3NN DU 4UCH
4ND3R3 D4M1T 83G315T3RN W1LL5T

What is a System ?

- "A System is a whole consisting of two or more parts(1) each of which can affect the performance or properties of the whole,(2) none of which can have an independent effect on the whole, and (3) no subgroup of which can have an independent effect on the whole. In brief, a system is a whole that cannot be divided into independent parts or subgroups of parts."(Ackoff, 1972)
- Parts without which a system cannot perform its function are called essential

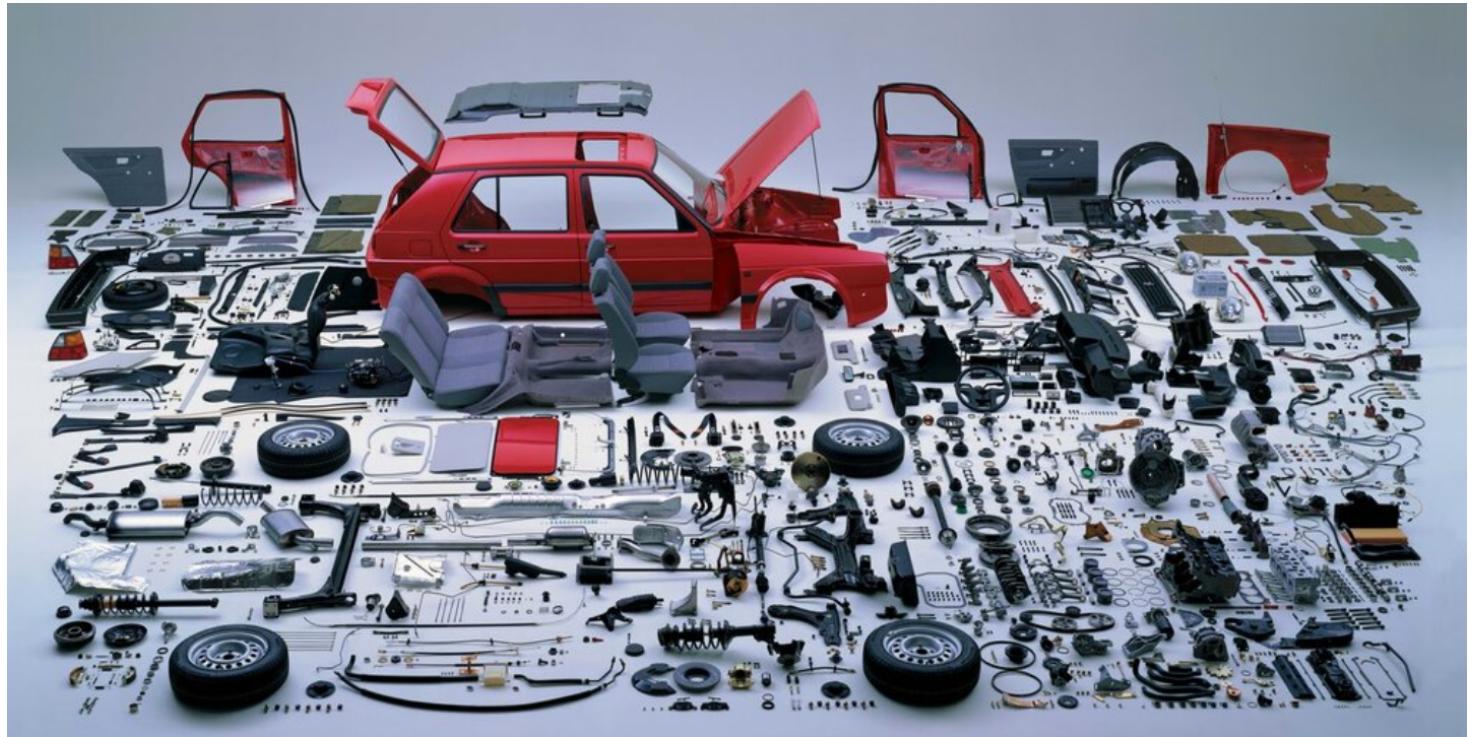
Three Types of Systems

- Mechanical
- Organismic
- Social



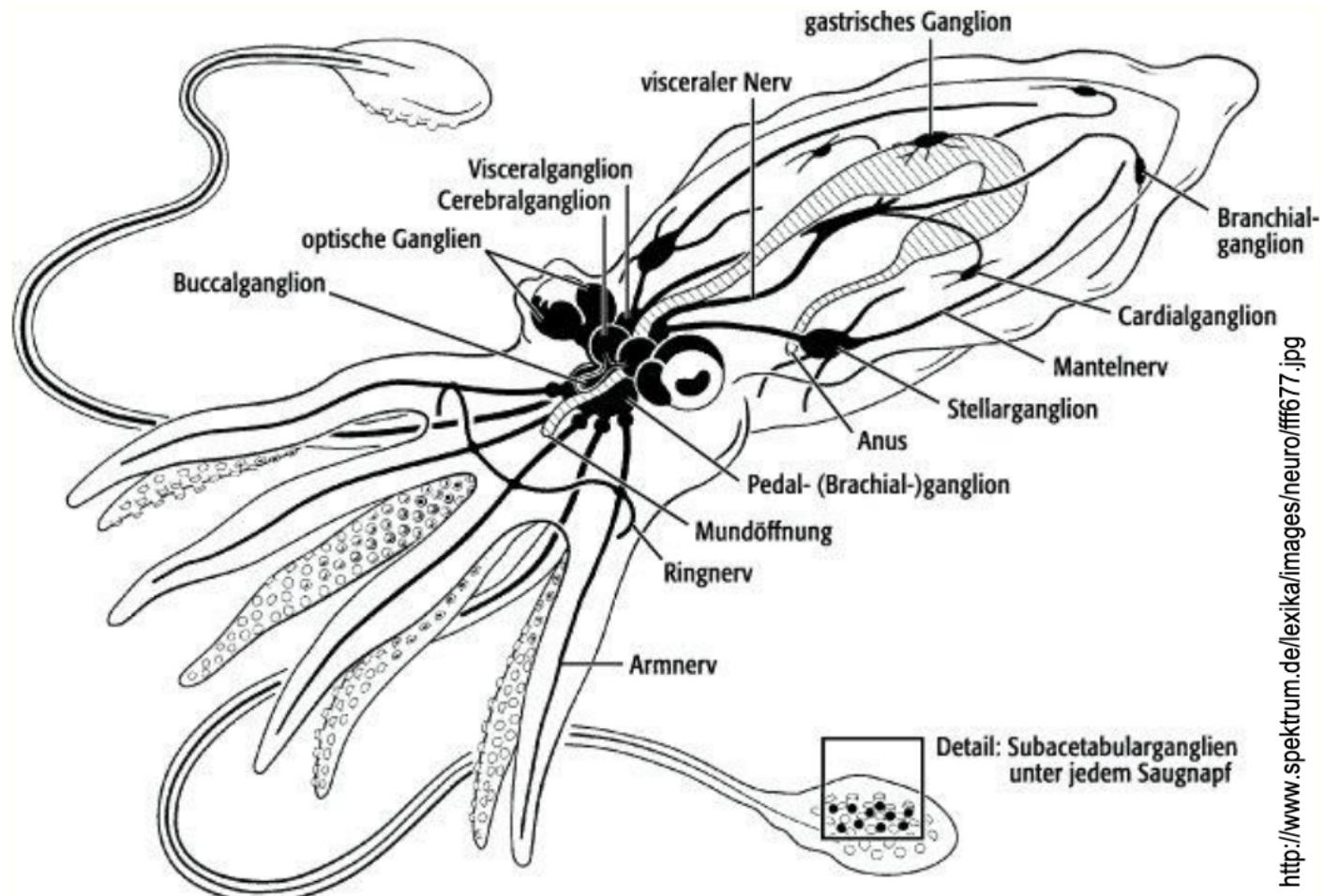
Mechanical Systems

- Open or closed
- No purpose on its own
- Serves its creators purpose
- No single part has purpose, but function



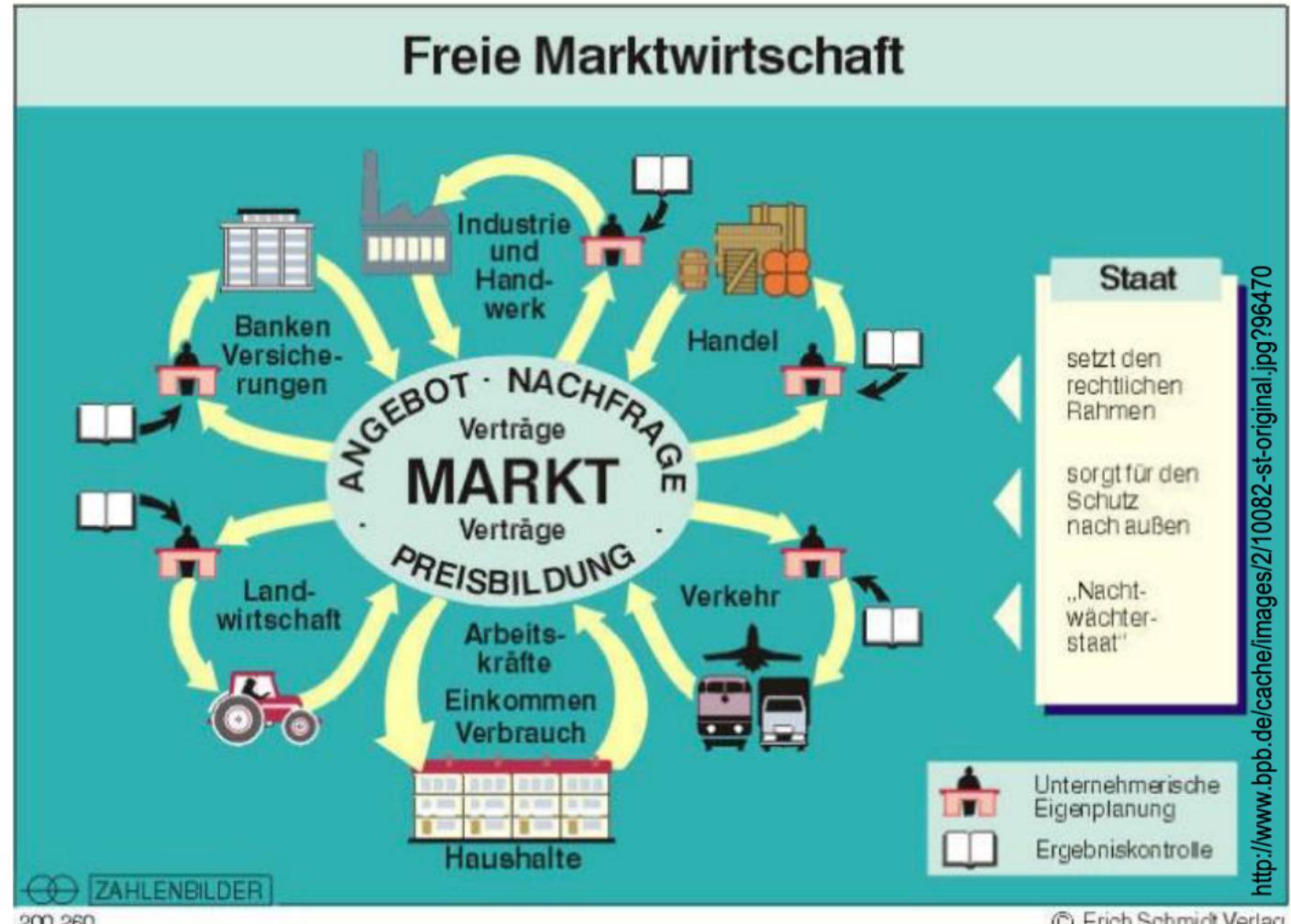
Organismic Systems

- Open
- One inherent goal/purpose
- Each part has a function

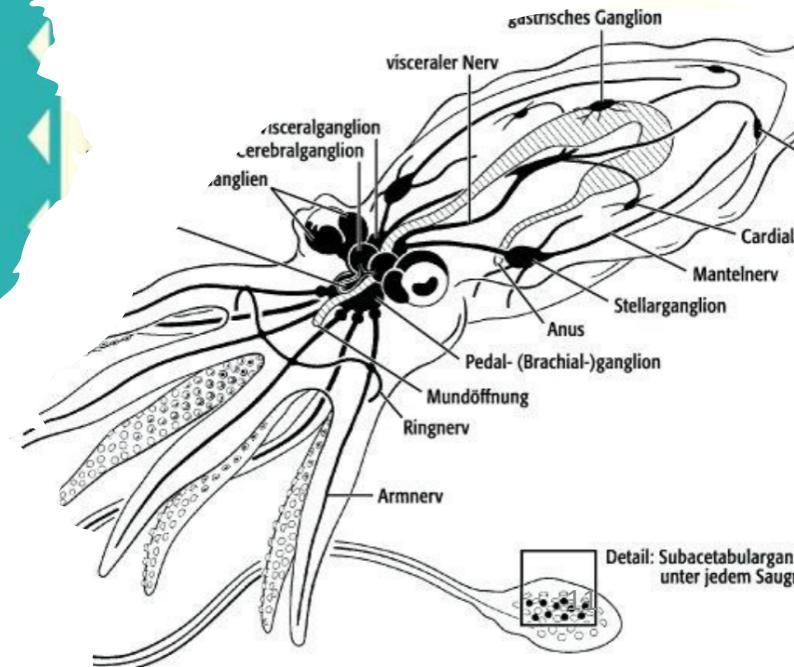


Social Systems

- Open
- Own purpose
- At least some essential parts have purpose on their own
- Its containing system has purpose on its own



All three types are both entity and concept



What is Management?

- “the control and organization of something, esp. a business and its employees.”(cambridge dictionary)
- “Management (lateinisch manus, „Hand“ und lateinisch agere, „führen“, „an der Hand führen“), zu Deutsch Verwaltung, ist ein Anglizismus für jede zielgerichtete und nach ökonomischen Prinzipien ausgerichtete menschliche Handlungsweise der Leitung, Organisation und Planung in allen Lebensbereichen.”(Wikipedia)
- What does it need to manage and what needs managing ?

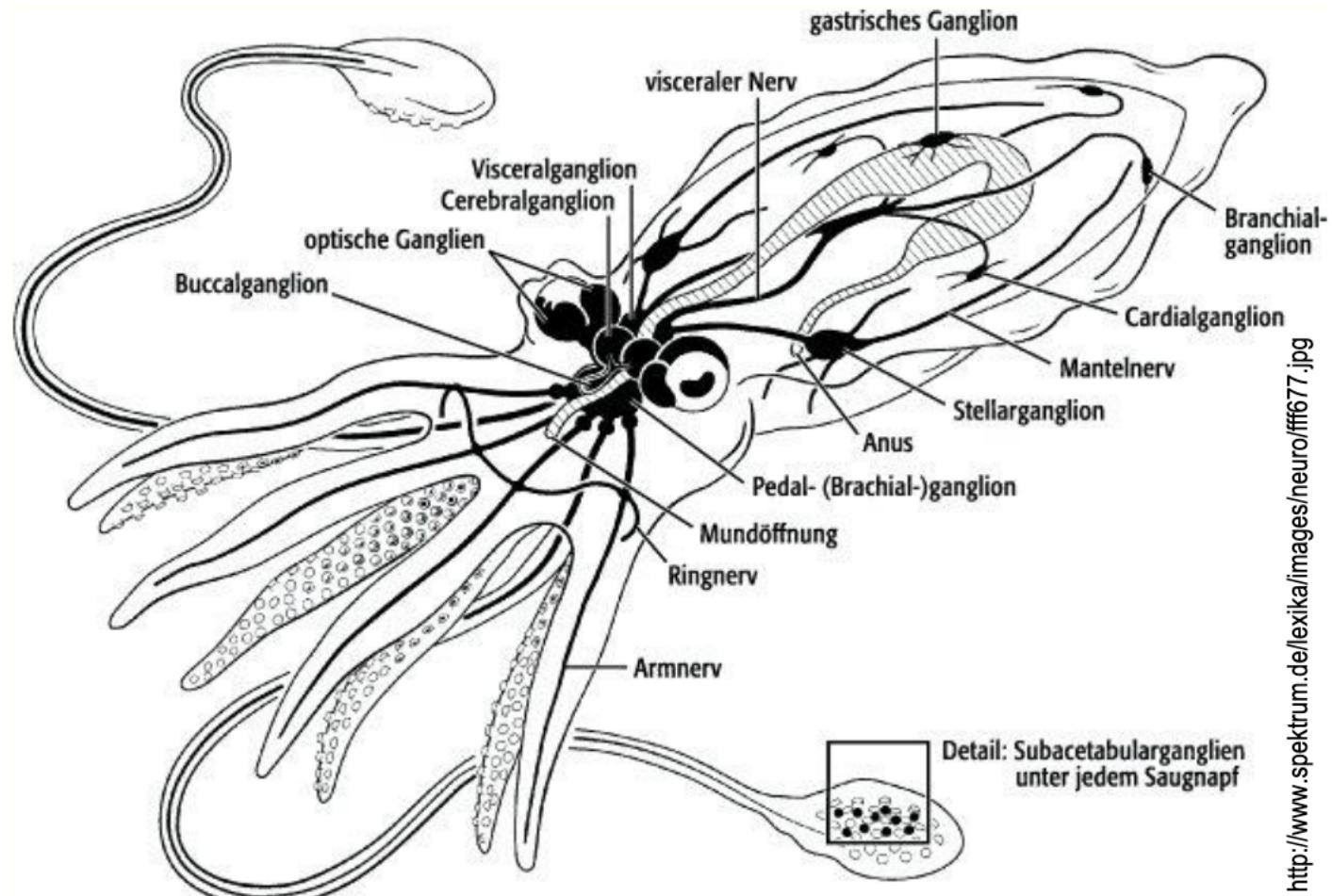
Enterprise as a Machine

- Owner is “all-powerfull”
- Workers are parts
- Parts are interchangeable
- No specific skills required
- “reckless” use of parts due to vast supply.



Enterprise as an Organism

- “Head of the firm”
- Corporations (lat. *corpus* body)
- Abstract ownership due to public stock market
- Growths vs. control
- increasingly difficult work tasks
- Parts no longer easy to replace



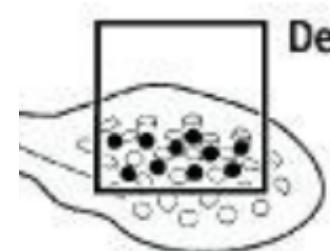
Enterprise as a Social System

- Increasing complexity in both enterprise and state
- Worker movements
- Labour parties
- Interaction focused
- People centric
- Workers, enterprise and state all have purpose on their own.



Management by Analysis

- “If each part is managed well, the whole will be.”
- Reductionist approach, taking the whole apart.
- Manage each part separately
- Come to a general understanding by reassembling the parts



Management by Synthesis

- Find the context (other parts) the system is part of.
- Understand its role or function within that context
- Explain properties and behavior on that basis
- Manage interactions within the system and with its context



https://www.freepik.com/premium-photo/cars-parked-side-city-street-covered-with-dirty-snow-winter_11156346.htm



<https://www.spektrum.de/news/tintenfische-veraendern-beim-denken-ihr-erbgut/1715560>



Problem solving

- Absolution
 - Ignore the Problem.
- Resolution
 - Quick fix. Create a state that satisfies. Focus on the specificity of the problem.
- Solution
 - Optimum within the given context. Focus on generality.
- Dissolution
 - Redesign the entity or the environment where the problem arose. Enables for "better" than current optimum state.

Knowledge and Understanding

- Knowledge
 - Comes from analysis.
 - It is knowing HOW something works.
- Understanding
 - Comes from synthesis.
 - It is to understand WHY something behaves or works the way it does.
- It needs both.

Summary

- Systems can be understood mechanical, organismic and social
- The understanding has implications on the management
- Both knowledge (analysis) and understanding (synthesis) are needed for successful management

Questions

- How about today ?
- Is there a relation between the three types?