

► TRIAD «STRUCTURE, INFORMATION, FRACTALITY»



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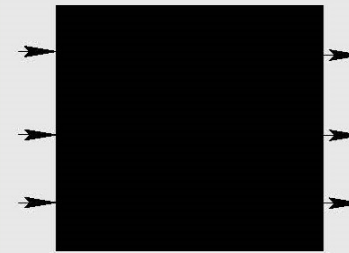
- ▶ **SUBJECT:** In philosophy: a knowing and acting human being, an entity opposed to the external world as an object of knowledge.
- ▶ **OBJECT:** That which exists outside of us and independently of our consciousness, the external world, material reality.



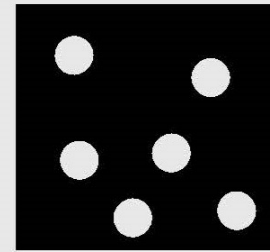
structure scheme systems (white box)

If you combine the “black box”, composition and structure models, you get a model that is often called a “white (transparent) box”.

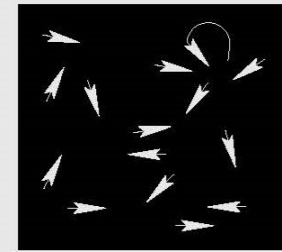
The “white box” indicates all elements of the system, all connections between elements within the system and connections of certain elements with the environment (inputs and outputs of the system)



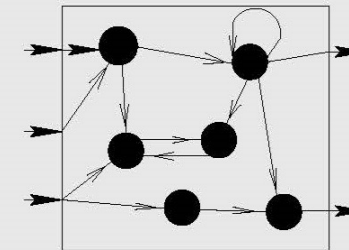
black box



composition



structure



structural
scheme



INFORMATION

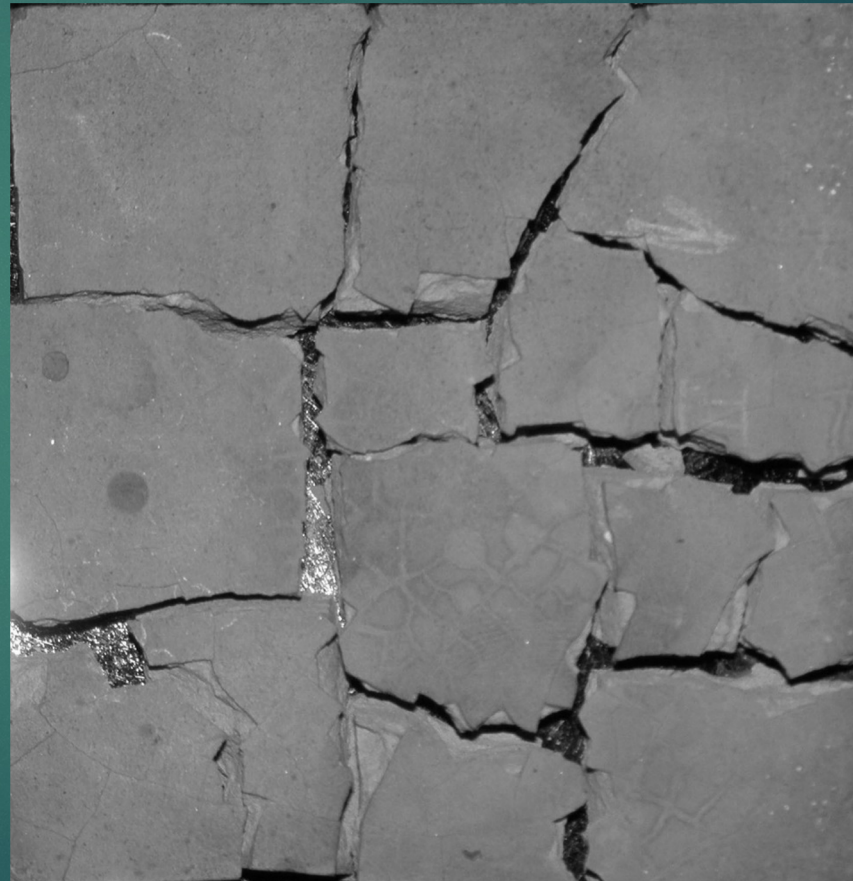
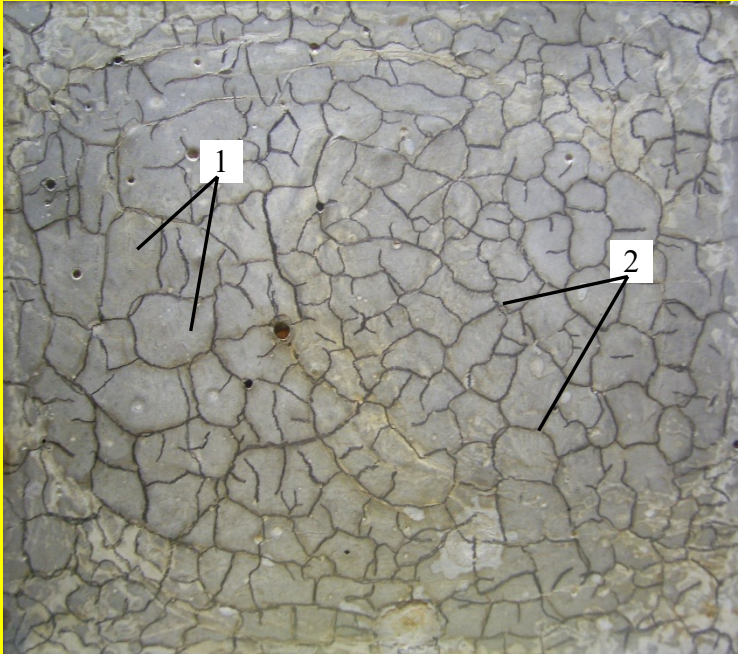


- Information (from the Latin *informātiō* “explanation, presentation, concept of something” ← *informare* “to give form, form, teach; think, imagine”) - information regardless of the form of its presentation.



STRUCTURE

- ▶ 1- structural element;
- ▶ 2- internal interfaces



METHOD FOR DETERMINING FRACTAL DIMENSION

TOPOLOGICAL DIMENSION

1

2

3

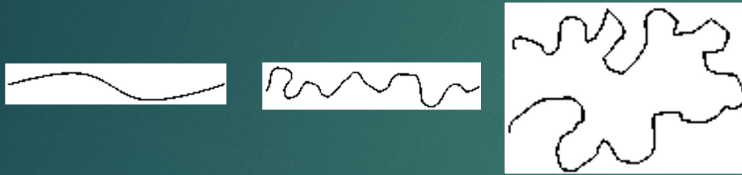


FRACTAL DIMENSION

1,05

1,28

1,63

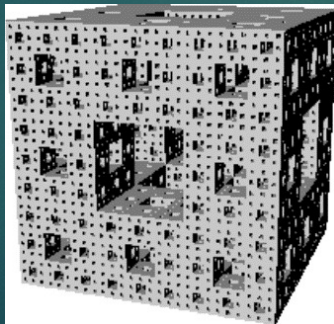


DEFINITION OF THE HAUSDORFF DIMENSION

$$D_H = \lim_{r \rightarrow 0} \frac{\ln N}{\ln(1/r)}$$

FRACTAL STRUCTURES

MENGER'S SPONGE



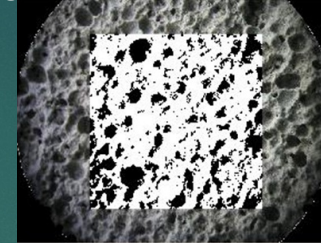
$$D_H = \frac{\ln 20}{\ln 3} \approx 2.73$$

FRACTALS IN METAL SCIENCE

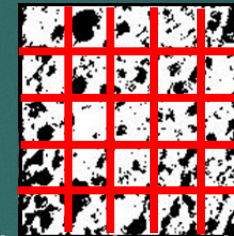


DETERMINATION ALGORITHM FRACTAL DIMENSION

1. converting a fragment of a photograph to monochrome:



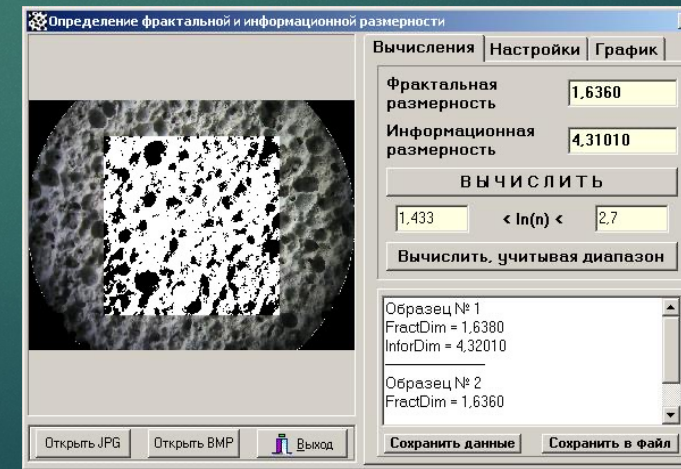
2. applying a grid to a monochrome fragment and determining the number of cells with "pores"



3. Decrease the grid step and repeat step 2.

4. calculation of the fractal dimension upon reaching the minimum cell size.

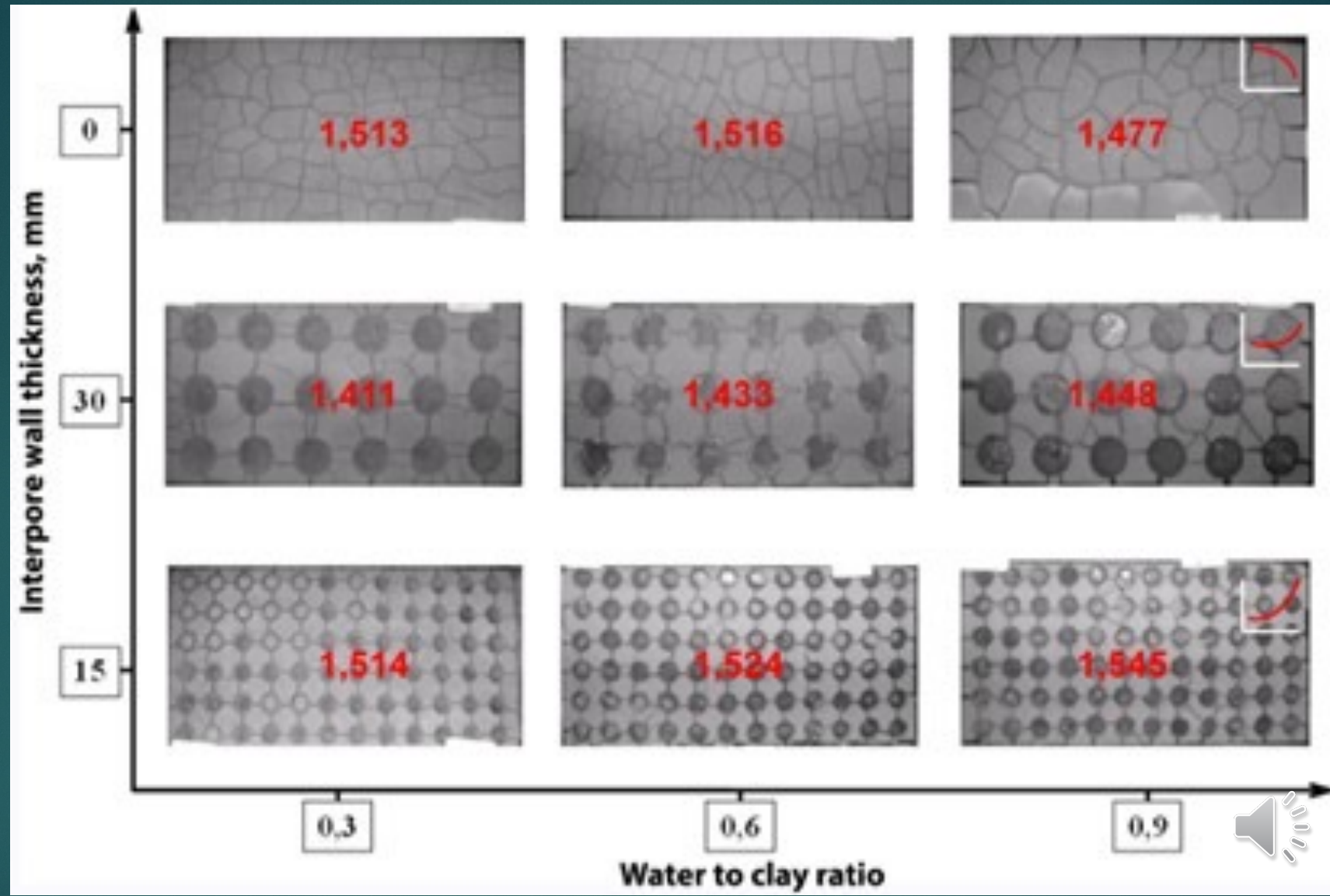
APPEARANCE OF THE WORKING PANEL

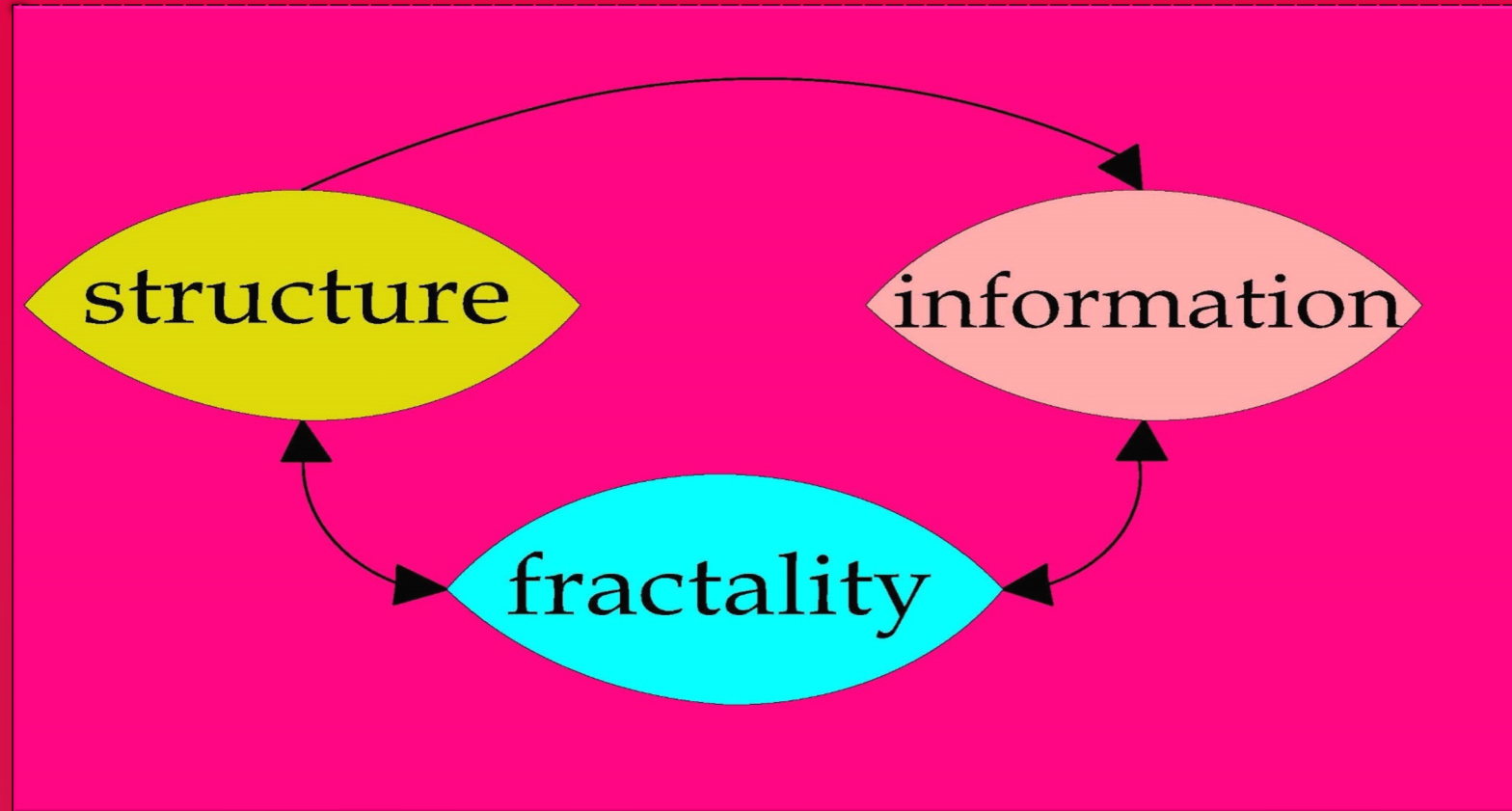


TRIAD

A triad in Hegel's "Science of Logic" is a union of any two opposite concepts and some third concept that mediates (that is, expresses) the internal unity of two opposite concepts.







**THANK YOU FOR YOUR
ATTENTION**

