

A Catastrophic Introduction to Topology

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Catastrophe (mathematics)

Discontinuous
(not gradual) change in
state that occurs as
parameters (conditions)
vary continuously.



Painting by Tom Bagshaw

Fold Catastrophe

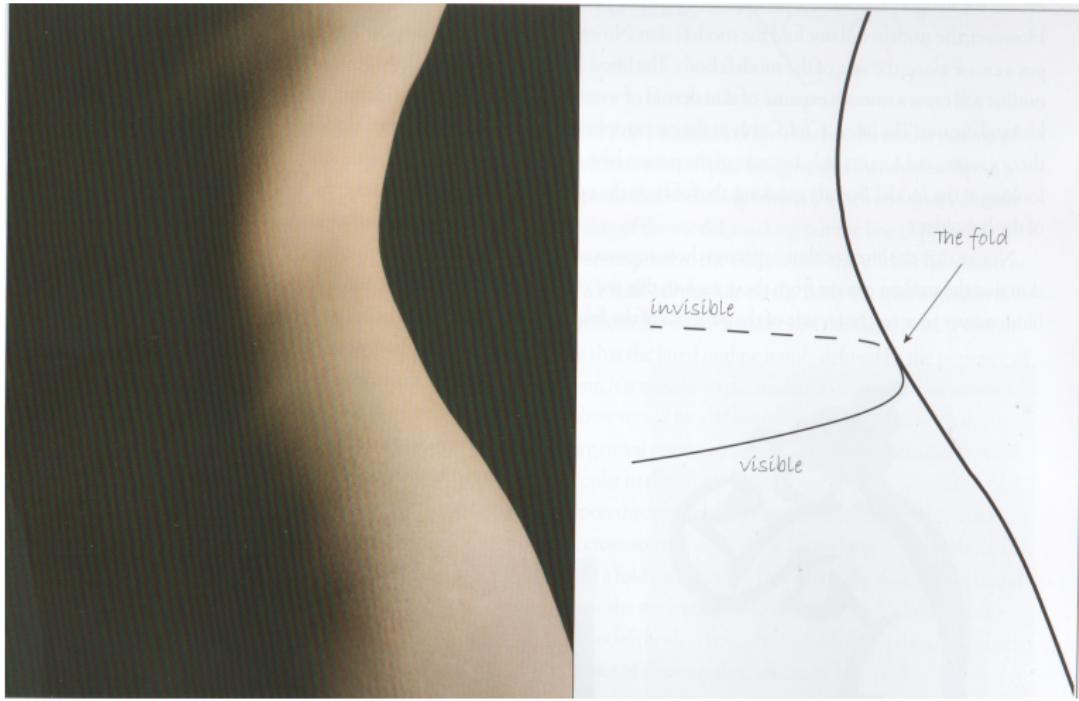
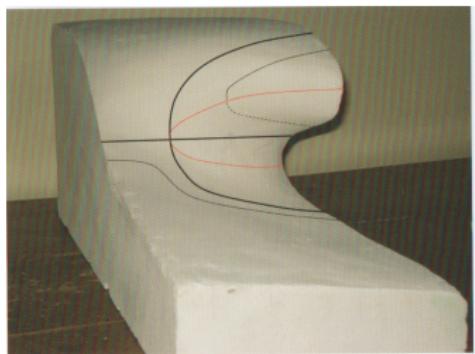
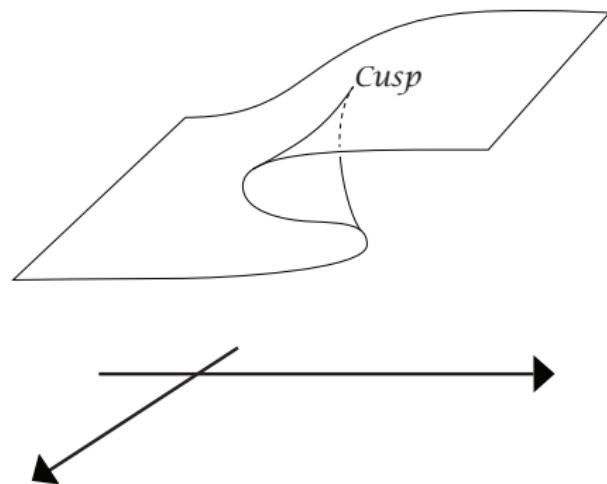


Illustration from A. McRobie, *The Seduction Curves*

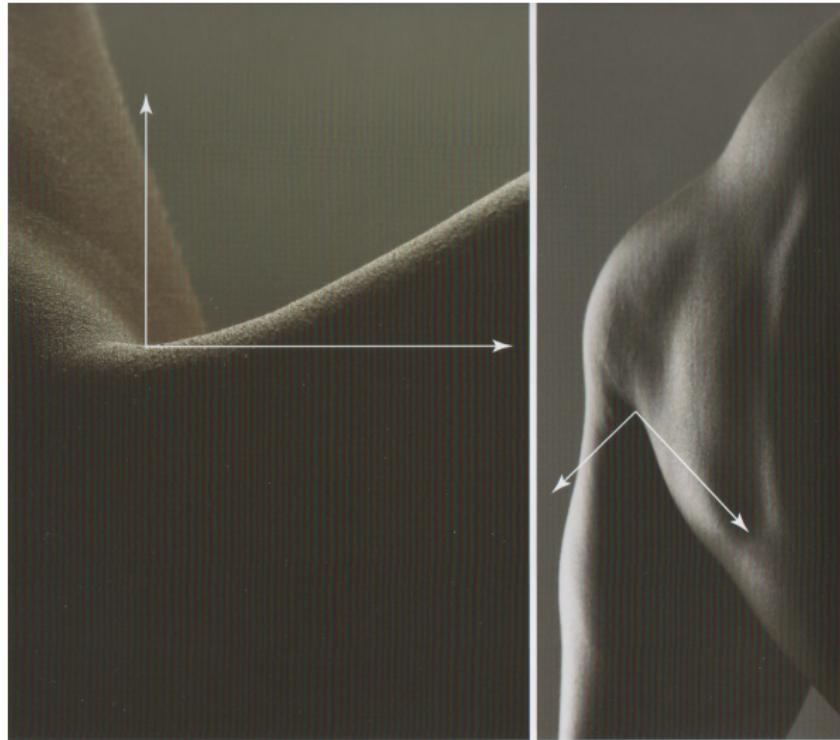
Cusp Catastrophe



McRobie, op. cit.

modality & hysteresis

Cusps Seen on the Human Form



McRobie, *op. cit.*

Light Caustic in Your Morning Coffee



Ibid.

René Thom (1923-2002) & 7 Elementary Catastrophes

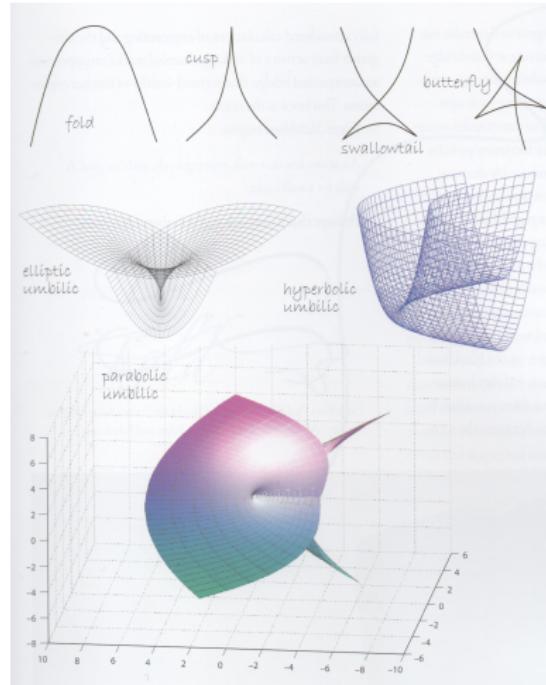


Photo by Konrad Jacobs

McRobie, op. cit.

Mathematics is Collaborative



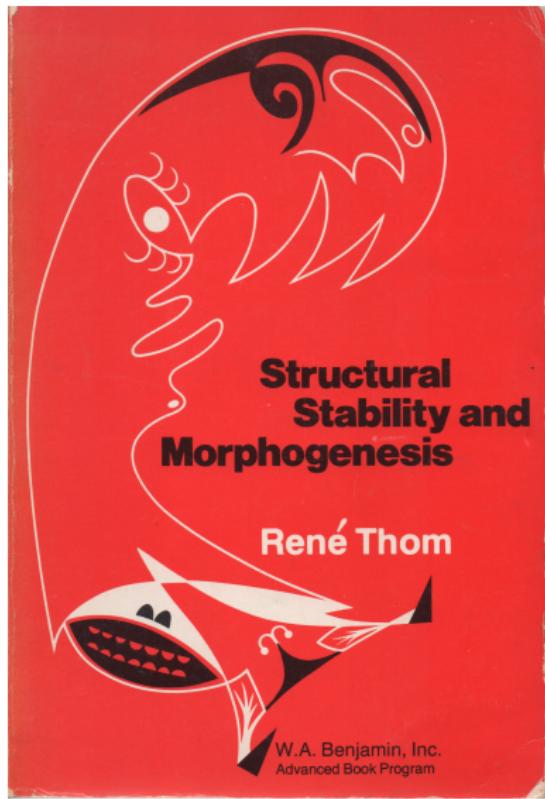
Photo by Renate Schmid



Photo by Günther Sawitzki

Many people contributed to the proof and to further development of the theory.

Thom addresses not only mathematics, but also:



- ▶ Local models in embryology
- ▶ Global models for a living being
- ▶ Thought and language
- ▶ The structure of societies

Topology is a powerful means of visualizing, modeling, and understanding the qualitative aspects of the world.

Thank you!