

Structural Permeability as a Key Factor in Switzerland's Innovation Success Story

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- 1460 Foundation of the University of Basel
- 1559 Foundation of the Université de Genève
- 1798 Helvetic Republic (Revolution)
- 1803 Dissolution of the Helvetic Republic
- 1814 Restoration and Regeneration
- 1847 Civil War (Sonderbundskrieg)
- 1848 European Revolutions
- 12. September 1848 Foundation of modern Switzerland (Confoederatio Helvetica) as a centrally guided federalist confederation of individual cantons

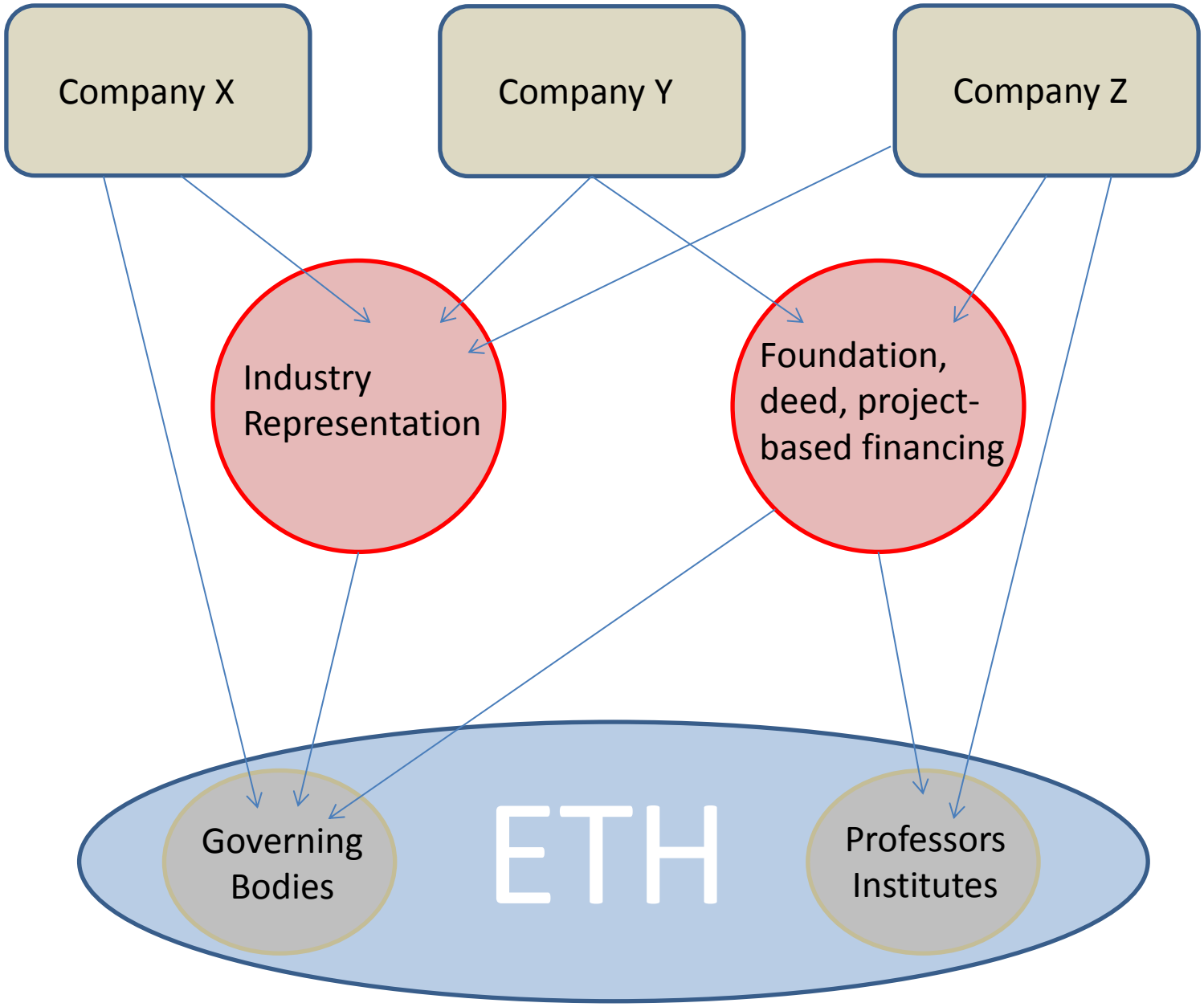
The Sonderbund War: Switzerland 1847

- Confederates
- Sonderbund
- Neutrals
- Federal offensives



- 1854 Foundation of the ETH (Swiss Federal Institute for Technology)
- Mission: to educate engineers and scientists, serve as a national center of excellence in science and technology and provide a hub for interaction between the scientific community and industry
- Tasked specifically with the training of specialists for industry and trade

- Attracted right from the start professors from other countries, specifically Germany
- Steering committees regularly staffed with people from the industry
- Collaboration in between the financially independent ETH and the industry
- 1952 Establishment of the «Swiss National Science Foundation»



Company X

Company Y

Company Z

Industry
Representation

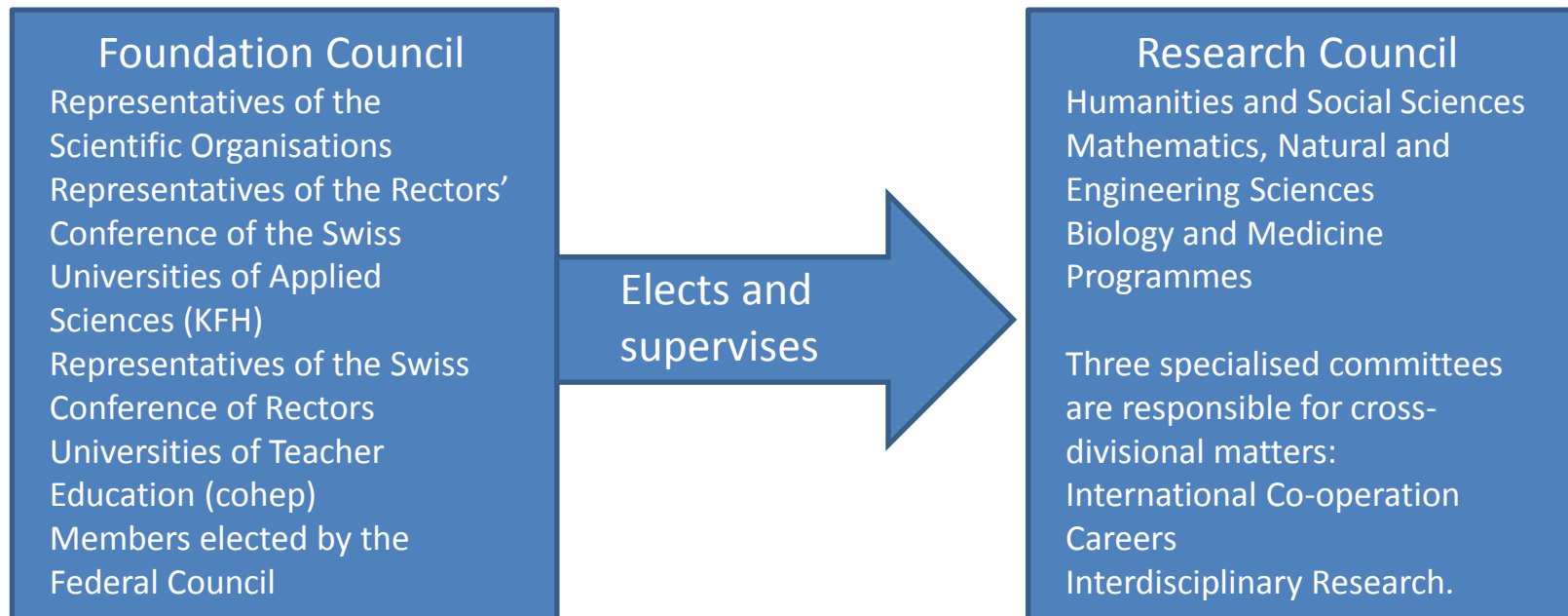
Foundation,
deed, project-
based financing

Governing
Bodies

ETH

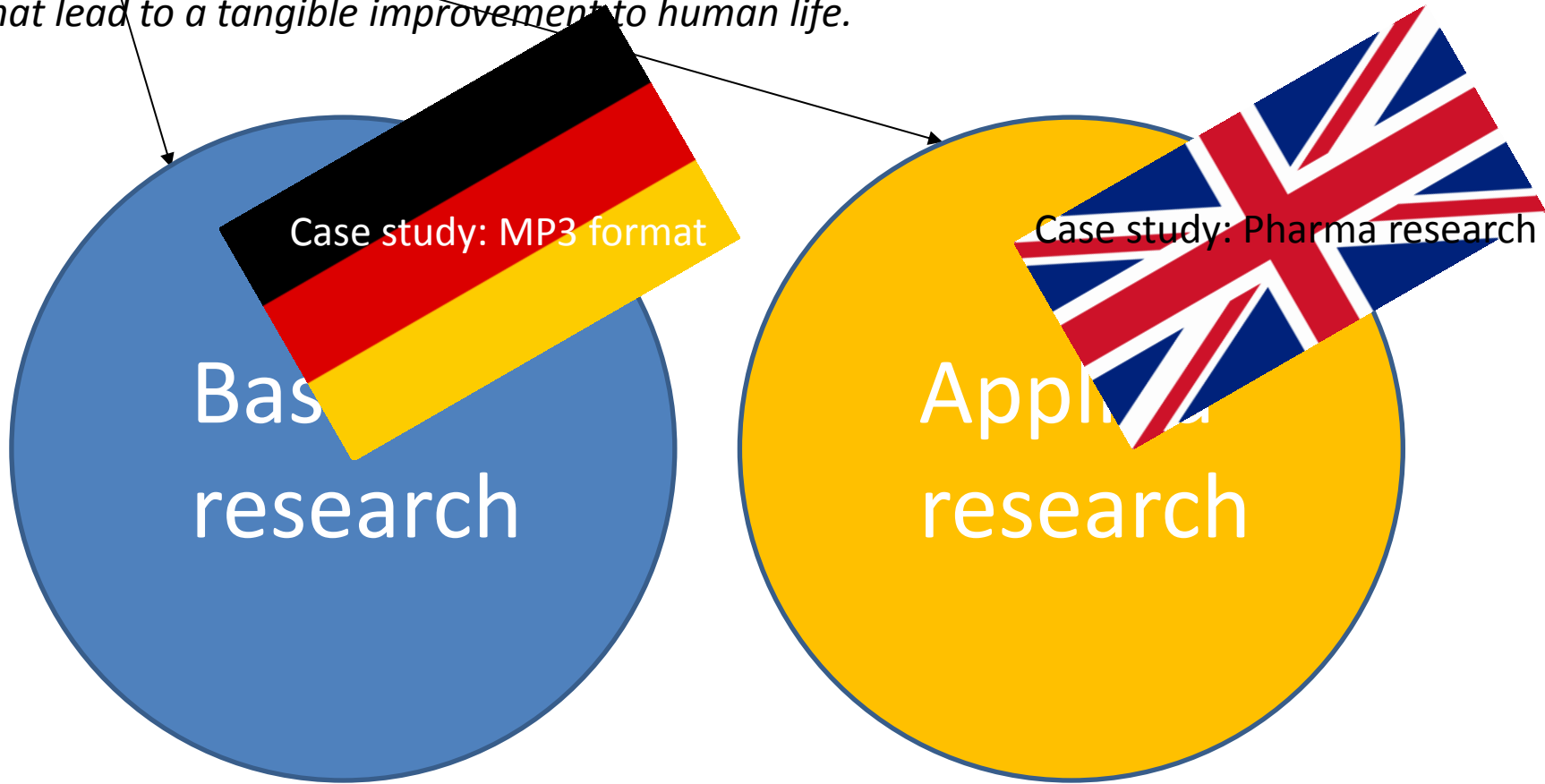
Professors
Institutes

- Swiss National Science Foundation to support basic research projects set up in 1952
- Budget 2010 approximately 800 million Swiss Francs



By innovation we mean:

The creation and commercialisation of differentiated products/services that lead to a tangible improvement to human life.



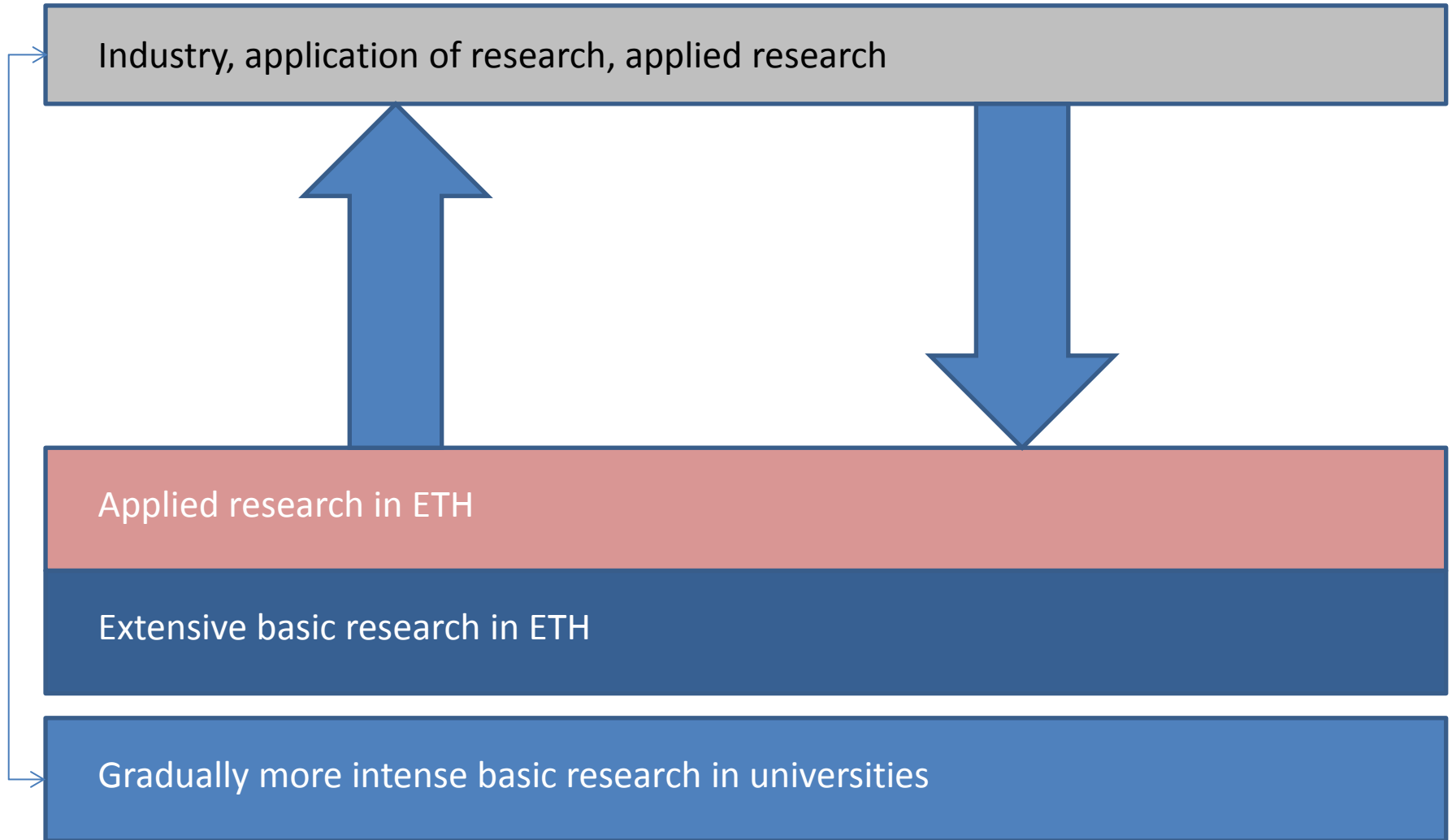
Switzerland before 1850

Industry, application of research

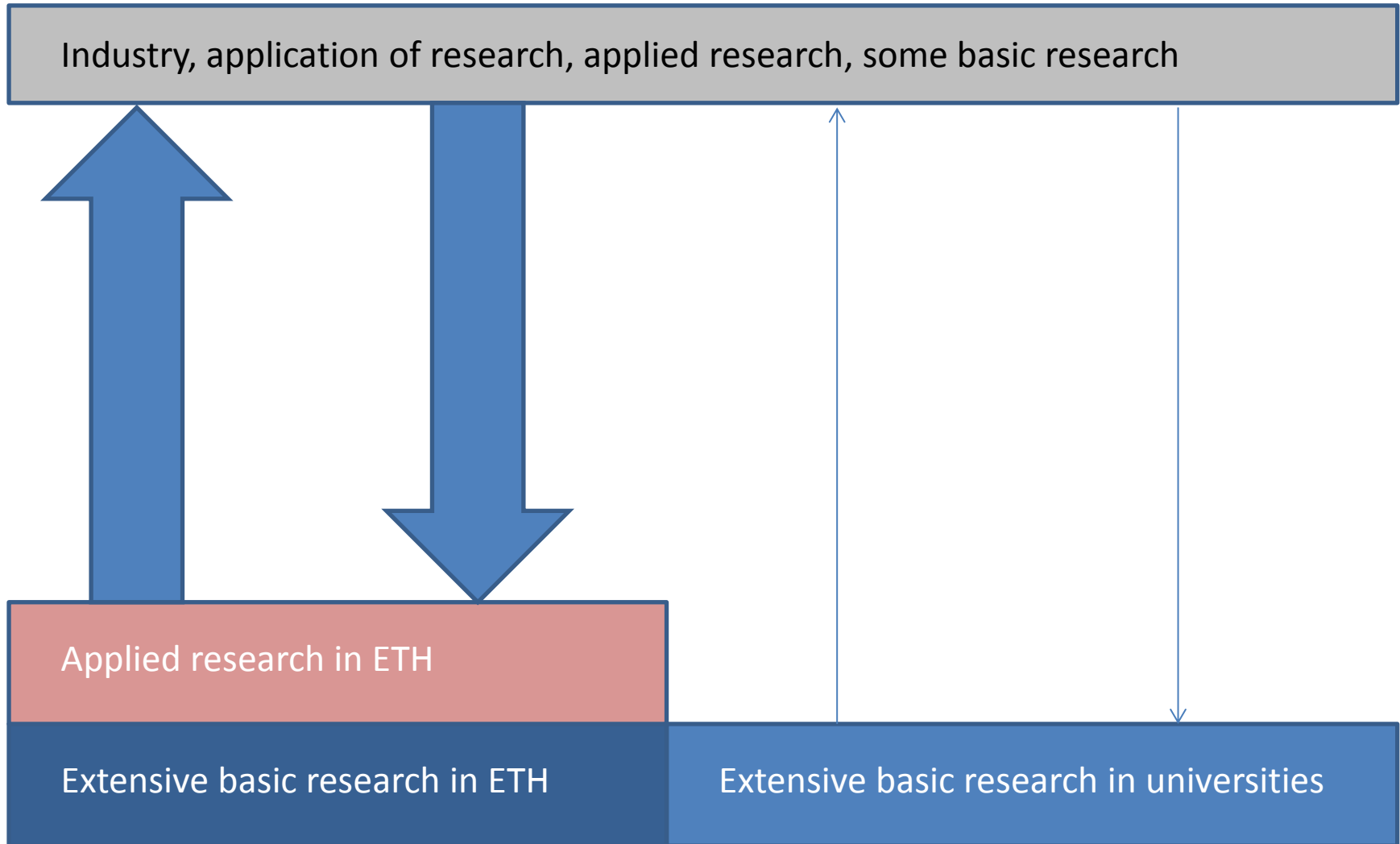


Very limited basic research in universities (mainly Basel, Geneva and Zurich)

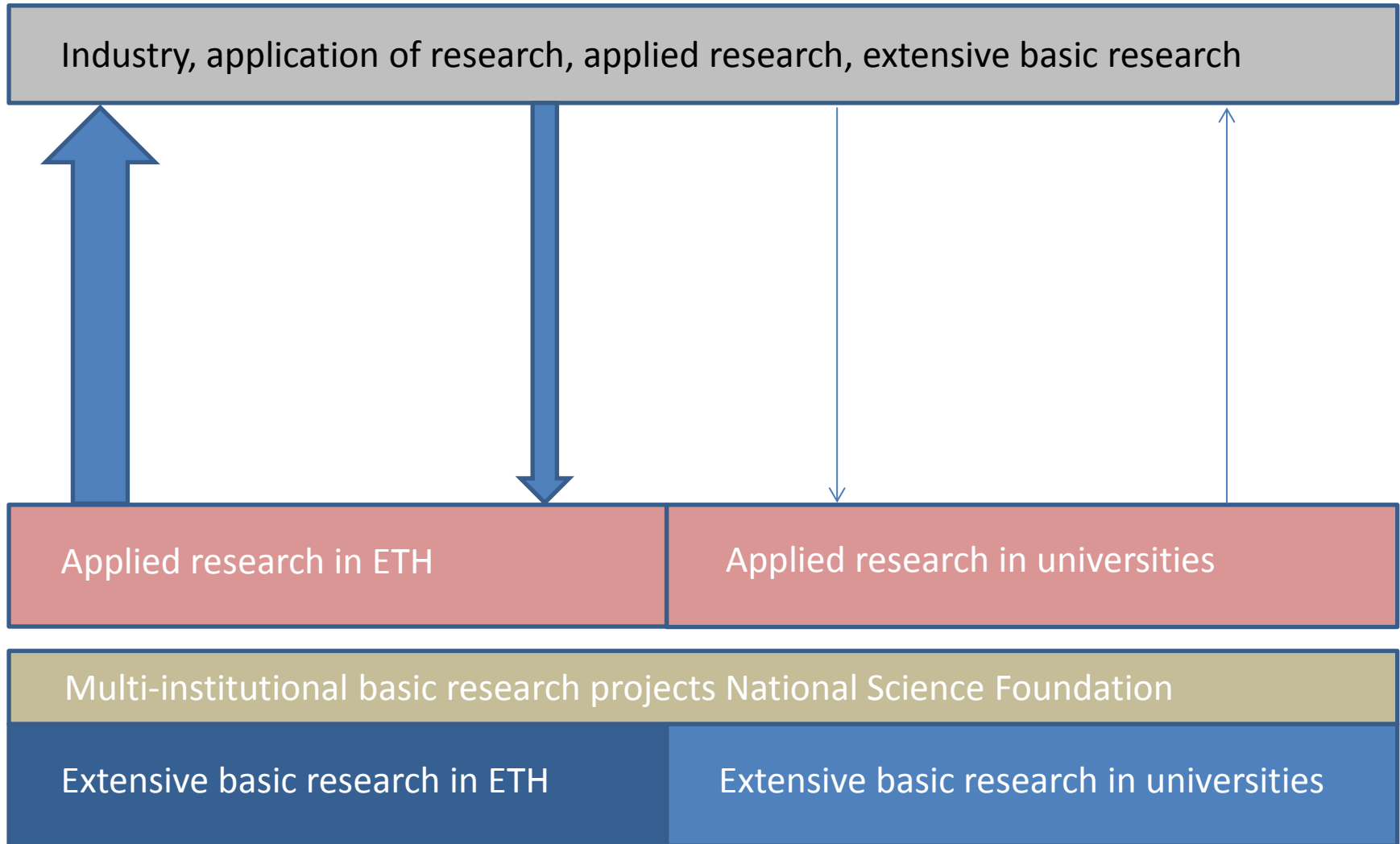
Switzerland after 1850



Switzerland after 1900

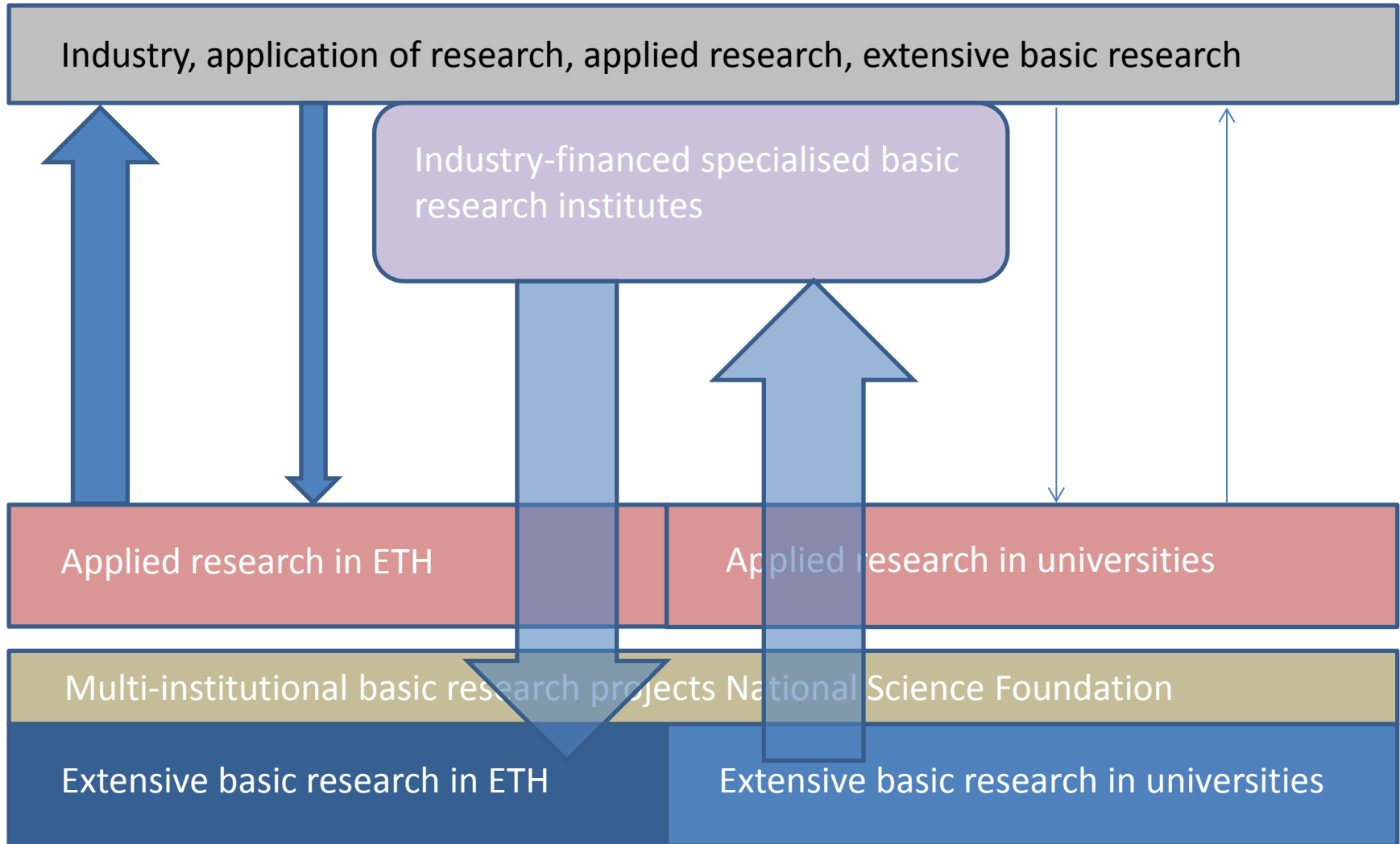


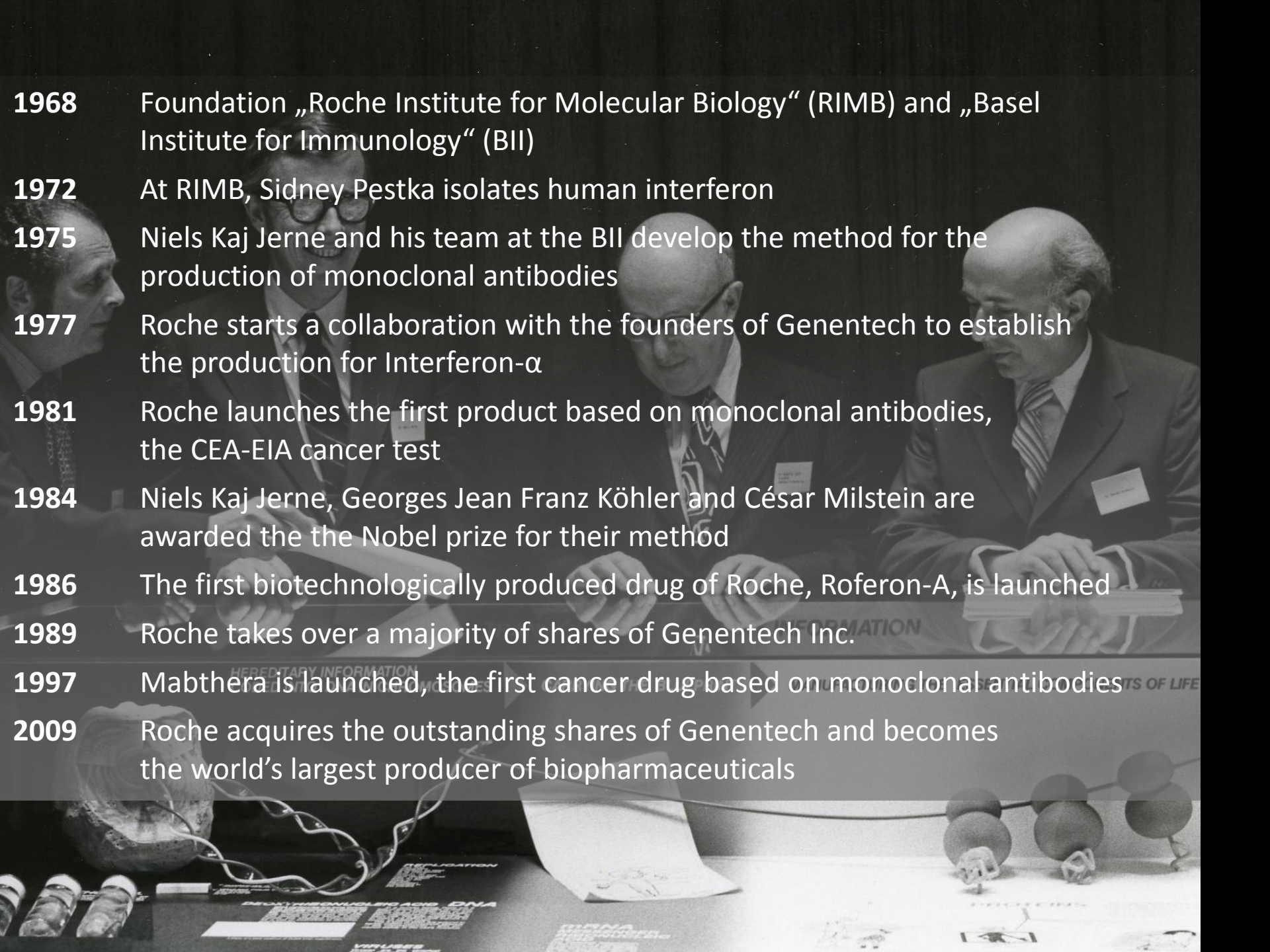
Switzerland after 1952



- In the wake of the II. World War, academia strived for independence from the industry
- Temporarily, the influence of the industry on the teaching programmes waned
- The industry reacted by setting up structures which permitted the exchange in between academia and industrial applied science
- Case study: Bio-sciences in the 1960s

Switzerland after 1965



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- 1968** Foundation „Roche Institute for Molecular Biology“ (RIMB) and „Basel Institute for Immunology“ (BII)
 - 1972** At RIMB, Sidney Pestka isolates human interferon
 - 1975** Niels Kaj Jerne and his team at the BII develop the method for the production of monoclonal antibodies
 - 1977** Roche starts a collaboration with the founders of Genentech to establish the production for Interferon- α
 - 1981** Roche launches the first product based on monoclonal antibodies, the CEA-EIA cancer test
 - 1984** Niels Kaj Jerne, Georges Jean Franz Köhler and César Milstein are awarded the the Nobel prize for their method
 - 1986** The first biotechnologically produced drug of Roche, Roferon-A, is launched
 - 1989** Roche takes over a majority of shares of Genentech Inc.
 - 1997** Mabthera is launched, the first cancer drug based on monoclonal antibodies
 - 2009** Roche acquires the outstanding shares of Genentech and becomes the world's largest producer of biopharmaceuticals

Switzerland after 1985

