

for
Dr. Gregory Breland

for Greg

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Comments/Rub.97—ICUS-1997

Comments on Rubinstein "The University in the Twenty-First Century"

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I am in agreement with Dr. Rubenstein's paper. So I will make some additions and a few very minor corrections.

P. 1. To understand the university, which originated in Europe, the preconditions for their development need some attention. The importance of the printing technique can scarcely be overrated. Before the middle of the 15th century the exchange between universities was extremely limited. The archetype of the university had the four disciplines: philosophy, law, medicine, and theology (witness the Prologue in Goethe's *Faust*). European intellectual life began to flourish after Gutenberg: Kopernikus, Adam Riese, Galilei, Newton (1643-1727), Leibnitz, Pascal, Bernoulli, etc.

I would like to mention a beautiful example of a university modeled on the corporation, hence a voluntary order: **Padova**. Founded in 1222, financed exclusively by the aristocratic students, hence independent. The students appointed the professors and fostered competition: for each problem cluster two professors were appointed and obliged to lecture about the same topic at the same time. The professors were appointed for a limited time; the only exception was Galilei, who got tenure after his presentation of the telescope (he lectured there 1592-1610). In 1594 the first teatro anatomico was established, in spite of the Church's protests. In 1602 William Harvey (blood circulation) got his doctorate there, Fallopius, Kopernikus were students. They were both Catholics and Lutherans. In 1587 the Lutheran students got a guarantee not to be molested by the Catholic Church. The students were international, but organized on the basis of regions, not of nations.

P. 1, 3rd para. The *thesis of the close association between university and state* does not apply to the natural sciences. It is true, however, that some disciplines tried to qualify as "state sciences". The "union of throne and altar" is not a specifically Prussian phenomenon; it applies as well to England, France, Spain, etc. English philosophers exerted considerable influence on the form of government. For Prussia it applies only for the time after Friedrich der Große. P. 2. To the thesis that the German university served as model throughout the world I would like to make two additions.

The idea of the so-called **Humboldt University** (Wilhelm v. Humboldt) was that, since the teacher must have a good overview of the current state of the discipline, hence has to specialize, there was a need for an organization that holds together the results that researchers have to offer and thus provide a link between research and teaching.

Secondly, that **also the scientific societies became a model**. About the turn of the century R&D moved to the Kaiser Wilhelm Institute (Otto Hahn), which after 1947 became the Max-Planck-Institutes. In 1911

the Aerodynamische Versuchsanstalt (German Research Center for Aeronautics) AVA, Göttingen) was founded, in 1911 the Deutsche Versuchstalt für Luftfahrt (DVL, Berlin Dalem), etc.

P. 3. **James Conant**, Director of the National Defense Research Committee, NDRC (1941) placed the research power of the USA as a *whole* at the disposal of the government. The Manhattan Project was only one of several.

There were other important research endeavors beside the Manhattan Project. **Operations Research** was one of them. It originated in England (1936 in Bowdsey for the systematic use of the newly developed Radar equipments). After the war it got also civilian uses, the RAND-corporation the NDR (Naval Defense Research), IAWR (Institute for Air Weapon Research). Its uses were also internationalized. This development radiated into the scientific enterprise. The Pentagon paid for many commissioned research tasks in the universities (mainly in mathematics and physics). The culmination point was SDI. After the war the USA achieve a rational scaling down, whereas the former East-Block countries the research associated with it simply collapsed. The result was that today the USA is the only super power.

P. 3, 3rd para. The importance of the emigration of scientists to the USA is rightly stressed. Before the war American students used to round off their studies at some German elite university. In the 30ies and 40ies whole disciplines emigrated: logical empiricism, Austrian economics, psychoanalysis, and a flood of top scientists—"Hitler's gift to America". After the war top researchers were treated as was booty. Emigration was state-organized. On the part of Russia and France coercively, as forced labor (the "rocket slaves", e.g.), on the part of the USA on a voluntary basis. Also neutrals profited from that sort of emigration (e.g. Sweden's aero industry). Then in the USA sciences flourished, also stimulated by the challenge of the Cold War.

P. 4, last para. With respect to the development of the Internet out of the US defense program, perhaps more caution is advisable in the evaluation of the merit of such networks for the military. Since secrete documents are never transmitted via electronic networks, the networks were mainly used for transmitting methods rather than for exchange of information.

P. 5, 4th para. After the end of the Cold War many scientific projects were abandoned, military expenditures reduces. Politician used the funds rather for vote buying, i.e., they invested it in "social expenditures". (In Germany these expenditures now total more than one third of the GNP.)

P. 9. To the remarks made on Bridgeport University and the likely future of the university, I would like to add the following. The tasks assigned to the university will depend on the development of the political environment. The danger for European culture comes from various quarters: Islamism is a threat (with totalitarian aspirations like the Church in the Middle Ages); the Far East will become a counterpart to the American-European world. Europe faces the risky constructivist project to create a political union by establishing a currency union. The outcome is more than uncertain, a protectionist "fortress Europe" is one of the possibilities. Whether there will be a sort of American-European culture in cultural exchange with the rest of the world is an open question, much as the future is open and uncertain.