

total amount of money that flowed into the American economy for research and development was a mere \$300 million.

In the course of World War II, due once again to the national defense needs, it rose to \$1.2 billion, and then, at the end of the war, with the "bring the boys home by Christmas" epoch, Congress responded to cut off the funds, turned the faucet off so to speak, and government-sponsored research started to collapse. But industry had learned a valuable lesson. Industry had seen so much magic flow out of the use of Federal funds for research in World War II that industry did not have corresponding inhibitions. The Government went ahead with its research. Once again, when the Korean war hit us, we had the same problem all over again in our national defense capability--obsolete weapons, insufficient weapons, even unsuitable uniforms. General Marshall called some of us down and briefed us in the Pentagon about these conditions. The state of the equipment for that first Marine division that left from Washington to fight in Korea was deplorable. This seemed especially unbelievable, in such a rich nation.

Accordingly the Korean war then inspired a new and upward push in R. & D. which has never decreased since. Thus by now with the cold war it has grown in the typical manner of American enterprise to such a vast behemoth that Congress is becoming concerned. So, for the first time we are beginning to see a plateau effect in volume for some of the government-sponsored research.

I do not say this is bad. It is merely noted for your observation. It should be obvious because we are considering the structure of American science and technology, that there also had to be some educational response to this need or it could not have occurred. We did not have enough scientists to do what has been described. We did not have enough engineers to do what has been described. In fact we did not have enough laboratories, facilities, instrumentation, and other facilities. So the educational institutions of the United States, for the most part, although not all, responded. Some were so deeply involved in liberal arts disciplines that they felt no particular responsibility toward the economy except to talk and write about it, so they did not institute efforts on their own behalf to add their great competence to the need of the Nation. Many institutions did, thank Heaven. I can cite Stanford Research Institute as an outstanding product of this reaction, with an annual billing of approximately \$40 million of research a year, and likewise my own university with its laboratories in Buffalo, with \$20 million a year.