

6, 10, 12, and 13 below), has risen to be a share whose magnitude should never be forgotten, 61.4% in 1954. In the military field almost entirely, and in civil progress largely, American invention takes place today because the Federal Government desires and supports it. The course of past expenditures, Federal and commercial organized, has been plotted in chart 3, in stable money. Repartitions between sciences and services are given in N 369, 370. The tax benefit attributed is much larger than the actual one of 1953-4, because the later, present law has been assumed as then operative. See ¶ 390.

[384] In the above and our following paragraphs, we have not attempted to reckon the amounts spent for education, nor for pensions and social security for researchers, because of difficulty and because the Government, industry, and the other agencies presumably contribute to these latter services for invention in somewhat equal proportion to their funds specifically allotted.

[385] 2. State governments (aside from their universities and agricultural experimentation):

Funds supplied, 1953-54----- \$9.3 million, 0.16%.

The expenditures of the States for conduct of general R&D in 1953-54, some \$220 million, went mostly to their universities, counted below under section 3, and to agriculture, natural resource development, health and welfare, rather than directly to invention proper, estimated above. Our questionable national estimates are based on the 6 scattered States covered in the Government report,³⁷² which raised 26% of the \$15.3 billion for all State purposes, and on the assumption that the 69.5% of their own money represented in their general R&D expenditures, prevailed also for invention, which we guess at only 6% of their R&D. Their other research funds came chiefly from the Federal Government.

[386] The inventive activities of local government are probably still smaller, and we find no data, except on Los Angeles smog control. As stated before (¶ 224-6), local and State governments are great markets for inventions, but produce hardly any, not wishing to use patenting themselves, and having no other way to oblige the many beneficiaries for the needed inventions to help pay for them. Of course the commercial suppliers of State and local government, e.g., fire-engine manufacturers, use patents.

[387] 3. Universities and colleges (proper):

Funds supplied, 1953-54----- \$27 m(illion), 0.48%
Performance, general R&D----- \$450 m., 8%

The universities and colleges proper exclude the agricultural experiment stations and separately organized research institutes, and their "own funds" include support from State governments. The rather small amount thus contributed, \$27 millions,³⁷³ contrasts with the abundance of research performed, chiefly with Federal money. Their great service to invention is through scientific and general education, and pure science research, and providing a good *milieu* and staff for R&D paid for by others. In the engineering schools \$64,390,000 was expended, mostly Federal money, with only \$3.5 million from the schools.³⁷⁴ The universities held about 775 American patents, 0.13% of all, mostly administered by the Research Corporation.³⁷⁵