

of some importance, and for minor ones and discoveries so far as these require for their use a patent on some other invention; but patents avail only for the last stage of great new, fundamental starts like the voice-operated writing machine. The inventions most suitable for patenting are made by corporations usually, of less than monopoly size. Attempting to measure in chapter 9 the various sources of support for invention, and for the researches in physics, chemistry, and such sciences that are indispensable and largely inseparable bases for modern invention, we find the Federal Government supports 61% of these, including 15% through tax benefits, highly organized industry 31%, small companies and unorganized inventors 2%, patent pooling 3.7%, Compulsory License, Sales of Know-how, Suggestion Systems, Foundations, and Universities, each about $\frac{1}{2}\%$, and the remainder in smaller contributions from State governments, Professional societies, Trade Associations, and Awards. Combining and rearranging categories, we find that private industry *performs* about $70\frac{1}{2}\%$, but *supports* only 37%, and fully competitive industry supports about 33%, against Government's 61% and philanthropy's 1.4%.

[18] While roughly maintaining their absolute importance, as we said, patents are shown to have been improving in quality, but losing in favor with the courts, and declining greatly in relative importance because of the prodigious rise of noncommercial invention. The swiftly accelerating rate of American inventing and invention-oriented research is graphed in four charts (§ 56), which are the first elaborate and fairly satisfactory measures of the rate of inventing and its researches, and which go back for 80 years. With striking agreement and steadiness, these graphs plot rises of 105-fold in output, and around 340-fold in annual inputs or efforts to invent, during the period 1880-1960. In the same years the count of patents to Americans rose only 3.3-fold, little more than the population. The history of patents is sketched, new attempts are made, and others quoted, to measure the value attached to patents, their older philosophy is largely refuted, and their seven sound economic reasons are set forth. These could serve as guides to what patents should be granted, under ideal conditions, and how the whole patent system might be better directed. Four basic merits and seventeen shortcomings and abuses of the patent system are separately analyzed in chapter 7, with statistics for the first time on the full direct costs of the patent system, amounting to something like \$3,000 per average patent. Special attention is paid to the sources and remedies for the many invalid ones being granted. Forty-one percent of all sued on to a court conclusion are found invalid, and 21% fail to cover the methods used by the sued "infringer," leaving only 28% definitely victorious.

[19] Chapter 8 is devoted to "Fundamental Inventions—Nobody's Baby." Past history and statistics and a discussion of many great inventions now struggling through a helpless infancy, prolonged often through centuries of difficulty, find their explanation in that neither patents nor any of our other institutions provide any serious support for such basic inventions, save in the military and rare other categories. As we learned a century or more ago that *science* cannot support itself, but must be supported, so we must learn that fundamental inventions, like the reading machine, the voice-operated writing machine, and the desalting of water, are in the same helpless situation as was science.