

3.—Research-Development Expenditures, by Size Group, 1957

Size Group ¹	Firms	Research-Development Cost	Percentage of Total
	No.	\$	
\$50,000,000 or over.....	57	108,116,078	72.49
\$10,000,000 to \$49,999,999.....	131	22,028,562	14.77
\$ 1,000,000 to \$ 9,999,999.....	221	14,774,187	9.91
Under \$1,000,000.....	46	4,225,252	2.83
Totals.....	455	149,144,079	100.00

¹ Based on annual sales value in 1957.

During 1957 the equivalent of 4,448 professionally trained scientists were employed on research-development projects. The three top industrial groups, in terms of numbers of professionally trained employees, were transportation equipment, electrical apparatus and supplies and chemical products, which together accounted for almost 63 p.c. of the total professional employment in the research field.

Classification of the professional scientists by field and degree of training reveals that for all types of engineers engaged in research there is a greater predominance of professional employees with bachelor degrees. On the other hand, medical scientists, geologists, geophysicists or other earth scientists, chemists, administrators, physicists and agricultural scientists have a greater percentage of the professional employees engaged in research work with doctorate or master degrees than in the engineering field or in the over-all pattern.

In addition the reporting companies employed the equivalent of 7,263 supporting personnel on research-development work, of whom 3,737 were research-development technicians, 802 were skilled craftsmen and 2,724 were other supporting personnel. The average ratio of supporting personnel to professional scientists or engineers for firms conducting research-development was about six to one.

4.—Professional Research-Development Scientists Employed, classified by Field and Level of Training, 1957

Field of Training	Level of Training			Total
	Bachelor	Master	Doctorate	
	No.	No.	No.	No.
Chemical engineers.....	399	53	51	503
Civil engineers.....	40	4	3	47
Electrical engineers.....	771	72	13	856
Mechanical engineers.....	886	25	15	926
Other engineers.....	310	41	16	367
Chemists.....	500	122	255	877
Physicists.....	105	35	45	185
Geologists, geophysicists and other earth scientists.....	10	11	10	31
Metallurgists.....	177	17	22	216
Mathematicians.....	42	6	4	52
Medical scientists.....	22	17	103	142
Agricultural scientists.....	18	2	6	26
Administrators (of research-development).....	67	16	34	117
Unclassified and others.....	86	8	9	103
Totals.....	3,433	429	586	4,448