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SCIENTISTS AND ENGINEERS IN CANADA: 1991

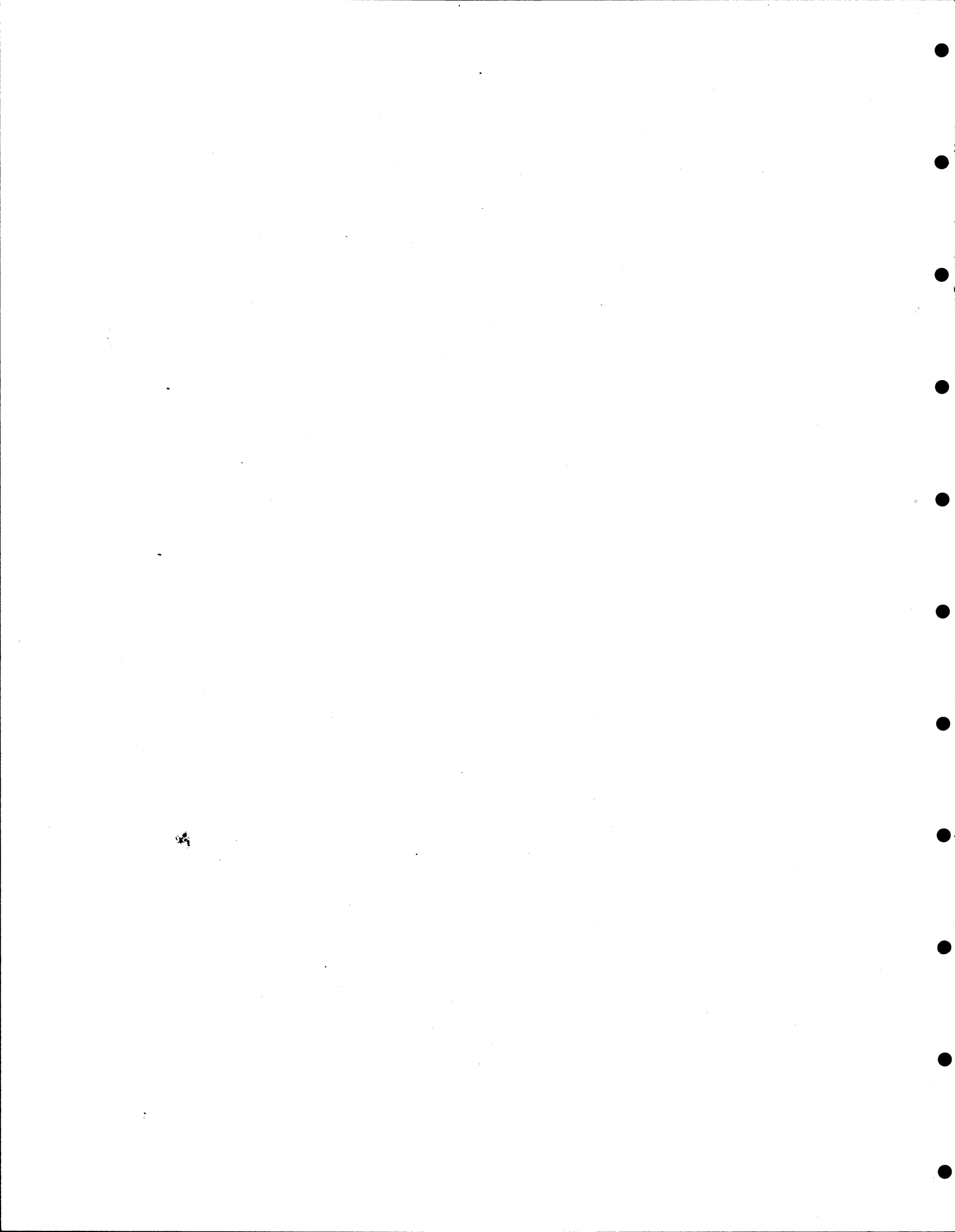
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EXECUTIVE SUMMARY

The typical member of the group "Scientists and Engineers" (S/E) in Canada is male, in his 30's, an employee, and likely to be engaged in the services (particularly business and production-related services) sector of the economy, after having earned a bachelors or equivalent college degree. There are exceptions to this characterization, since females, who account for almost one-fifth of scientists and engineers, are as likely to be employed in social community services as in business and production-related services, and slightly more likely to progress on to earn a masters or doctoral degree. Female scientists and engineers are slightly younger than their male colleagues, suggesting that females may account for an increasing share of scientists and engineers in the future. Other key findings are that: the share of Canada's labor force engaged in science and engineering trails the share in many of the leading industrial countries, and the country's per capita spending on research and development (R&D) is roughly half that of the United States. This comparative dearth of spending on R&D has been a subject of considerable debate in Canada for over a decade. Successive governments have grappled over how best to foster increased expenditures on R&D, so that the country's industries and university research centers are able to foster new technologies and bolster exports of technologically-advanced products.

PREFACE

The International Programs Center conducts demographic and economic studies, some of which are issued as Staff Papers. A complete list is included at the end of this report.

We are grateful to Statistics Canada for its assistance in providing data from the 1991 census upon which the tables and charts in this report are based. Within the International Programs Center, thanks are due to Lois Darmohray and Beverly Mathis for secretarial support and data verification. The use of data not generated by the U.S. Bureau of the Census precludes performing the same statistical reviews the Bureau performs on its own data.

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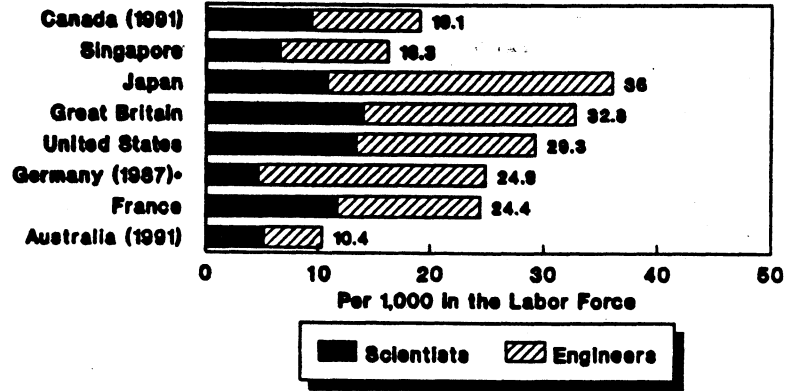
INTRODUCTION

This report presents statistics on scientists and engineers (S/E) for Canada, based on the 1991 census. It begins with a graphic comparison among countries, including the United States. This is followed by sections describing new data for Canada. Data tables provide detailed information upon which the graphic presentation is based. Users who wish to compare more closely data presented in this report with those of other countries should consult the list of IPC/CIR Staff Papers, in the back of this report. The most recently published report of this series is "Scientists and Engineers in Japan: 1990."

Canada has fewer scientists and engineers, relative to its labor force, than do many leading industrial countries. In 1991, Canada had just 19 scientists and engineers per 1,000 members of its labor force (Table Can-1(91) and *International Data Base*). In contrast, Japan had 36 scientists and engineers, and the U.S. had 29 scientists and engineers, per 1,000 members of its labor force in 1990. Among developed countries in Figure 1, only Singapore and Australia had fewer scientists and engineers, relative to their labor forces. Possible reasons for the low percentage is a reported lack of knowledge by much of the Canadian populace regarding the role that science and technology (S&T) plays in their economy, and presumably, minimal interest in S&T (Clark, 1993, p. 8; and Powell, 1989, p. 1). Related to this, funding for research and development has been inconsistent and is far below that of other leading industrial countries, measured on a per-capita basis (see below).

This thumbnail description of scientists and engineers in Canada, as well as the graphic presentation and appendix tables to follow, is based upon the 1991 Canada Population Census and other sources.

Figure 1. Scientists and Engineers per 1,000 Members of the Labor Force, for Selected Countries: 1990



• West Germany
Source: Table Can-1(91); Zaslav, 1996,
(Sing.) p. 2; International Data Base.

The scientist and engineering occupations are largely populated by males.

The vast majority of scientists and engineers (81 percent) are male (Table Can-1(91)). This contrasts sharply with the sex breakdown of the Canadian labor force, of which males comprise a much smaller majority, 55 percent (International Data Base). In each of the countries that has been reviewed in recent reports of this series (Australia-1991, Japan-1990, and Singapore-1990), males are far more heavily represented among scientists and engineers than in the overall labor force (International Data Base; Zaslow, 1995, pp. 17, 18; Zaslow, 1996, (Japan) pp. 15, 16; Zaslow, 1996, (Singapore) pp. 16, 17). Taking account of the gender composition of the overall labor force and the scientist and engineer population, Canada most resembles the distribution seen in Australia. In Canada, 55 percent of the national labor force and 81 percent of scientists and engineers were male, while in Australia, the corresponding shares were 58 and 81 percent. The gap is greater between males' share of Japan's national labor force and its scientist and engineer workforce, at 49 percent and 93 percent, respectively (Zaslow, 1996, (Japan) pp. 15, 16). In Singapore, males' share of both the national and S/E labor force are lower than in Canada (51 percent and 75 percent, respectively) (Zaslow, 1996, (Singapore) pp. 16, 17).

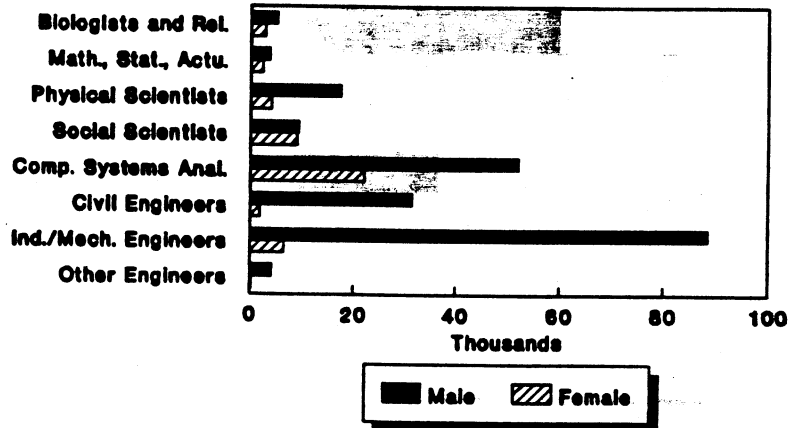
Industrial/mechanical engineering and computer systems analysis are the largest science and engineer fields.

Within the employment category "Scientists and Engineers," those with specialization in industrial/mechanical engineering and computer systems analysis predominate¹ (Figure 2). More than 140,000 males and 28,000 females, accounting for 65 percent of the overall employment category, work in these fields. Among males, there are also large numbers of civil engineers and physical scientists, accounting for 23 percent of all male scientists and engineers (Table Can-1(91)). Employment opportunities in these fields exist in Canada's significant mineral, and natural gas and petroleum sectors. Among females, the largest share (45 percent) of all female scientists and engineers is computer systems analysts (Figure 3).

Canada, similar to Australia, has comparable numbers of scientists and engineers (Table Can-1(91) and Zaslow, 1995, p. 17). By contrast, two Asian countries studied in recent reports of this series, Japan and Singapore, heavily favor employment of engineers (Zaslow, 1996 (Japan), p. 15 and Zaslow, 1996 (Singapore), p. 15).

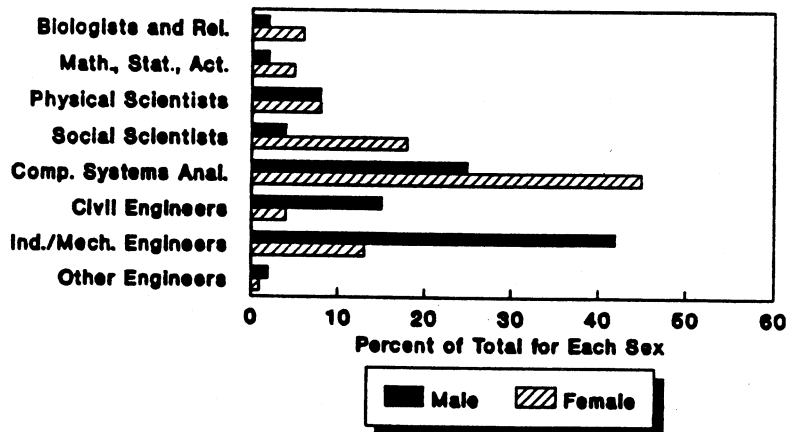
¹ See Table Can-1(91) for a list of occupations that constitute the category, "scientists and engineers."

Figure 2. Scientists and Engineers, by Specialty and Sex, for Canada: 1991*



* See appendix for complete listing of occupational titles.
Source: Table Can-1(91).

Figure 3. Distribution of Scientists and Engineers by Specialty and Sex, for Canada: 1991



Source: Table Can-1(91).

Research and development in Canada has lagged behind that of other developed countries.

In the long run, Canada's ability to bolster high technology production and exports will increasingly depend on the country's commitment to research and development. Canada spends about half as much as the United States, on a per-capita basis, on research and development (Figure 4). The potential consequences of this situation are severe. Many observers in Canada have warned that if this comparatively low level of R&D continues, Canada will be relegated to being little more than a country that copies technology of foreign origin, and Canadian universities will lose their ability to advance the overall level of scientific knowledge (Allan, 1986, p. 110; Slofstra, 1986, p. 22).

R&D workers are concentrated in technology-driven industries, whose viability depends upon their ability to devise increasingly advanced technology. In 1991, 53 percent of R&D personnel effort (measured in person-years) was in support of telecommunications equipment, engineering and scientific services, aircraft and parts, other electronic equipment, business machines, pharmaceuticals and medicine and computer and related services ("Industrial Research and Development," 1993, p. 10).

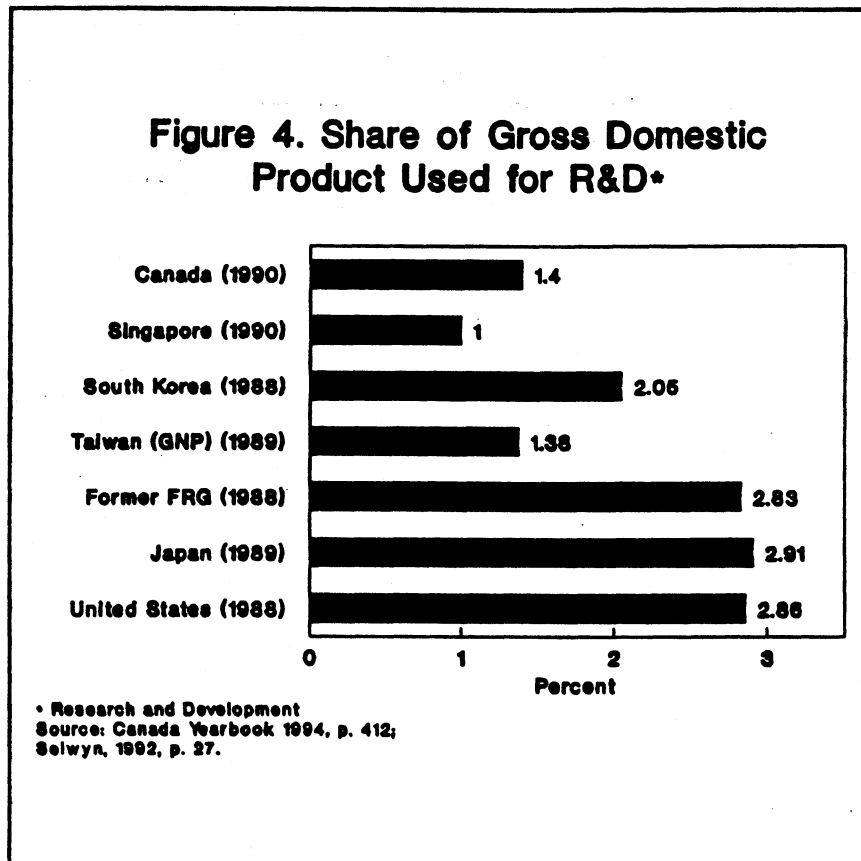
Companies employ various means to economize on the cost of performing research and development work and thus obtain greater benefits from limited R&D budgets. Companies share the expense (and benefits) involved in these efforts by forming alliances to perform joint R&D work with their competitors (Litvak, 1990, p. 61). Such alliances help compensate for the small scale of many Canadian companies, either in relation to larger foreign competitors (Grimley, 1987, p. 22) or to larger Canadian firms. Another cost-saving strategy is to jointly fund Industrial Research Chairs at Canadian universities (Boyd, 1992, p. 44).

A disproportionate share of R&D work is performed by a few large firms. In 1991, just 25 of the 3,566 Canadian companies engaged in R&D accounted for half of all R&D activities ("Industrial Research and Development," 1993, p. 9). Also, many of the firms engaged in R&D are foreign controlled (446 in 1991).² These companies' spending on R&D was far higher than for Canadian firms, on a per-establishment basis. In 1991, foreign firms (accounting for 13 percent of R&D-active companies) spent 36 percent of the total of business-funded R&D. This translates into spending \$1,952 million (in Canadian dollars) on R&D, compared to \$3,439 million (Canadian) by Canadian firms (Industrial Research and Development," 1993, p. 9).

Canada's efforts to improve its long-term competitiveness may also be hampered by how the scarce R&D funding is spent. Most R&D funding is for applied, rather than basic, research

² The Canadian firms that dominated R&D spending in the late 1980's were Northern Telecom, Bell Canada, CAE Industries, and Alcan Aluminum (Dingwall, 1989, p. 60). Therefore, telecommunications equipment had the highest sectoral share of R&D spending in 1991, 14 percent of total R&D ("Industrial Research and Development," 1993, p. 19). Further evidence of small firms' reliance on alliances is offered by a study of the Canadian electronics industry (Niosi and Bergeron, 1992, p. 309).

(Longair, 1990, p. 7).³ This approach limits advances to incremental improvements, rather than creation of qualitatively new technologies. Although this pattern in favor of applied research is not unique to Canada, the limited amount of research and development funding means that basic research in Canada is especially starved for resources.



³ In a general sense, applied research is related to a specific product or process, while basic research is designed to yield advances that may have a broader application, often to products that have not yet even been conceived.

The scientist and engineer labor force is comparatively young.

Nearly half (46 percent) of scientists and engineers are below age 35 (Table Can-1(91)). There are roughly equal numbers of scientists and engineers in the 25-29 and 30-34 age cohorts, accounting for 40 percent of all S/E. Subsequent 5-year age cohorts of S/E begin to noticeably decline beginning with the 35-39 age group. Among the S/E employment categories, computer systems analysts, and mathematicians, statisticians and actuaries are most concentrated below age 35 (Figure 5). In its age distribution of scientists and engineers, Canada closely resembles Australia, 45 percent of whose S/E are less than age 35 (Zaslow, 1995, p. 17). The share of scientists and engineers below age 35 is slightly higher in Japan (50 percent) (Zaslow, 1996 (Japan), p. 15), but considerably higher in Singapore (74 percent) (Zaslow, 1996 (Singapore), p. 16).

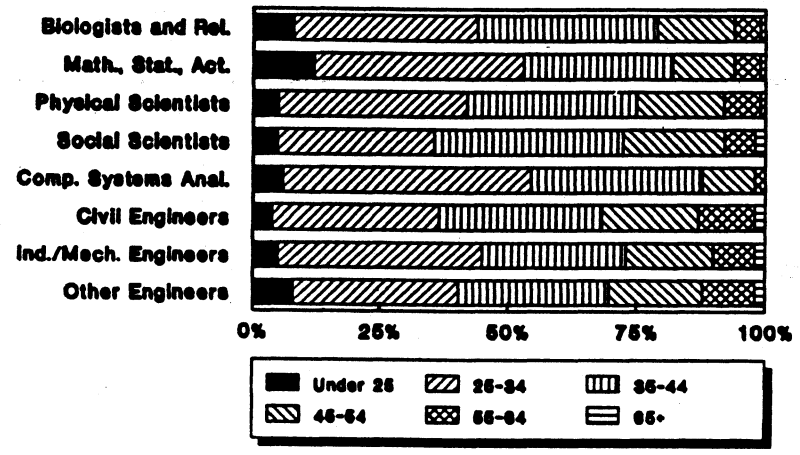
At 46 percent, scientists and engineers are more concentrated among the younger age groups than the country's overall economically active population. In 1991, 40 percent of Canada's economically active population was below age 35. This comparatively youthful profile is further enhanced by the fact that the size of 5 year age cohorts for the country's economically active population do not noticeably decline until the 45-49 year old age group (International Data Base).

The ages of those in the S/E occupation fields vary significantly by sex. Female scientists and engineers who are under age 35 account for 58 percent of all female S/E, compared to 43 percent for males (Table Can-1(91)). As in other countries studied in this series, this most likely reflects females' more recent entry into the work place.⁴ The comparative youth of female scientists and engineers may partially explain their reported under-representation among leadership positions in their occupation fields (Sheinin, 1989, p. 131).

A very weak correlation exists between the age distribution of female scientists and engineers and that of females with a bachelors or higher degree (a .064 correlation using 1991 data). Female S/E are more concentrated in the ages 25-44 (79 percent) than are the population of Canadian females with a bachelors or higher degree (67 percent) (Table Can-1(91) and Statistics Canada, 1993, p. 25). This may suggest that females in Canada are new entrants to the sciences and engineering, and that the correlation will strengthen as women become more established in the scientist and engineer workforce.

⁴ The percentage of females in Canada, aged 15 and older, who are economically active (either working, looking for work, or planning to start a business) increased significantly between 1971 and 1991, from 39.9 percent to 58.2 percent (International Data Base).

Figure 5. Scientists and Engineers, by Age Group, for Canada: 1991

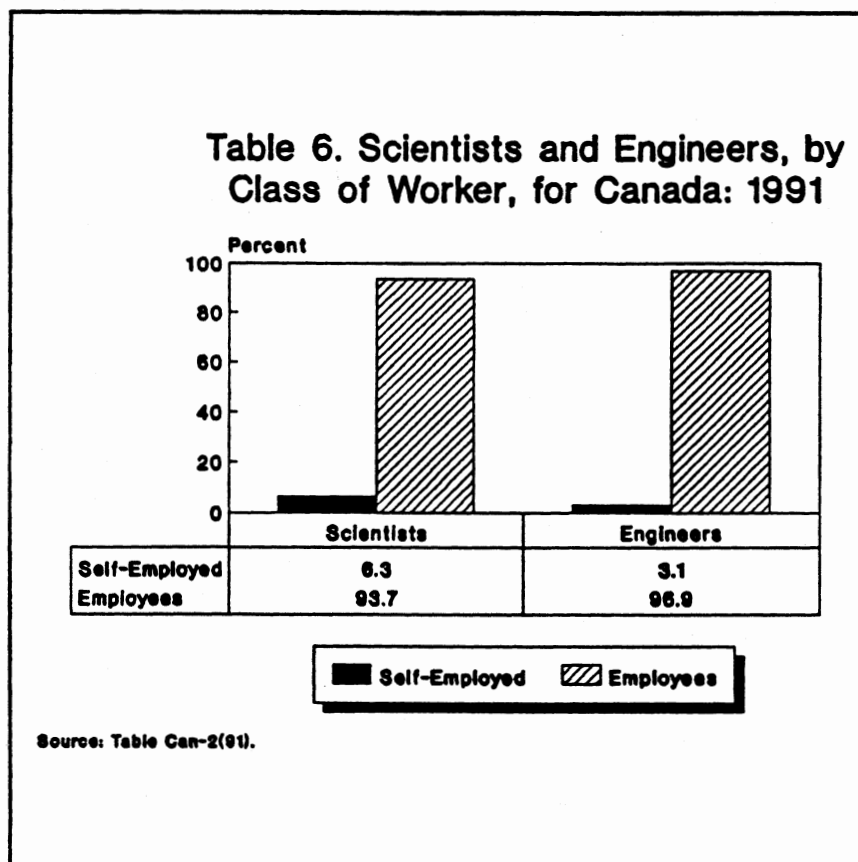


Source: Table Can-1(91).

Nearly all scientists and engineers are employees.

Overall, 95 percent of scientists and engineers in Canada are employees; specifically, 93.7 percent of scientists and 96.9 percent of engineers (Table Can-2(91) and Figure 6). Nearly all of the remaining S/E are self-employed.

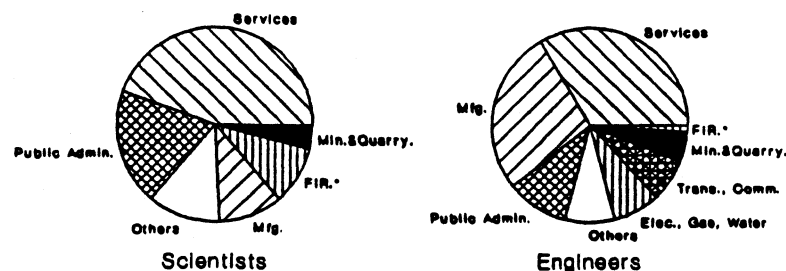
The share of self-employed among Canada's scientists and engineers is low, both compared to the overall Canadian labor force, and compared to other countries studied in this series. This share, at 4.7 percent of S/E (Table Can-2(91)), is less than half that of the total Canadian labor force (10 percent) falling into this category (*Canada Yearbook 1994*, p. 189). Lower proportions among S/E may reflect the higher start-up costs associated with science and engineering work. Underrepresentation of S/E among the self-employed is also seen in Japan, where in 1985, 5.5 percent of S/E are self-employed (compared to 11 percent for the total labor force). In Australia (in 1986) the differential practically disappears and the share of S/E that is self-employed (7.4 percent) nearly matches that of the total labor force (8.5 percent) (Zaslow, 1995, p. 20; Zaslow, 1996, (Japan) p. 18; International Data Base).



The services, public administration and manufacturing industries dominate employment of scientists and engineers.

The services, public administration and manufacturing industries employ 73 percent of scientists and engineers, or more specifically, 74 percent of scientists and 71 percent of engineers (Table Can-3(91)). Thus, scientists and engineers are less concentrated in these sectors than in the country's overall labor force (1988) where 89 percent are engaged in services and manufacturing (*The World Factbook 1995*, p. 76). Although the services industry employs the largest number of both scientists and engineers, its percentage share of scientists exceeds that of engineers (Table Can-3(91)). Canada's concentration of scientists and engineers in these three sectors closely mirrors the distribution of S/E in Australia, where 71 percent of scientists and engineers work in services, public administration, and manufacturing (Zaslow, 1995, p. 23).

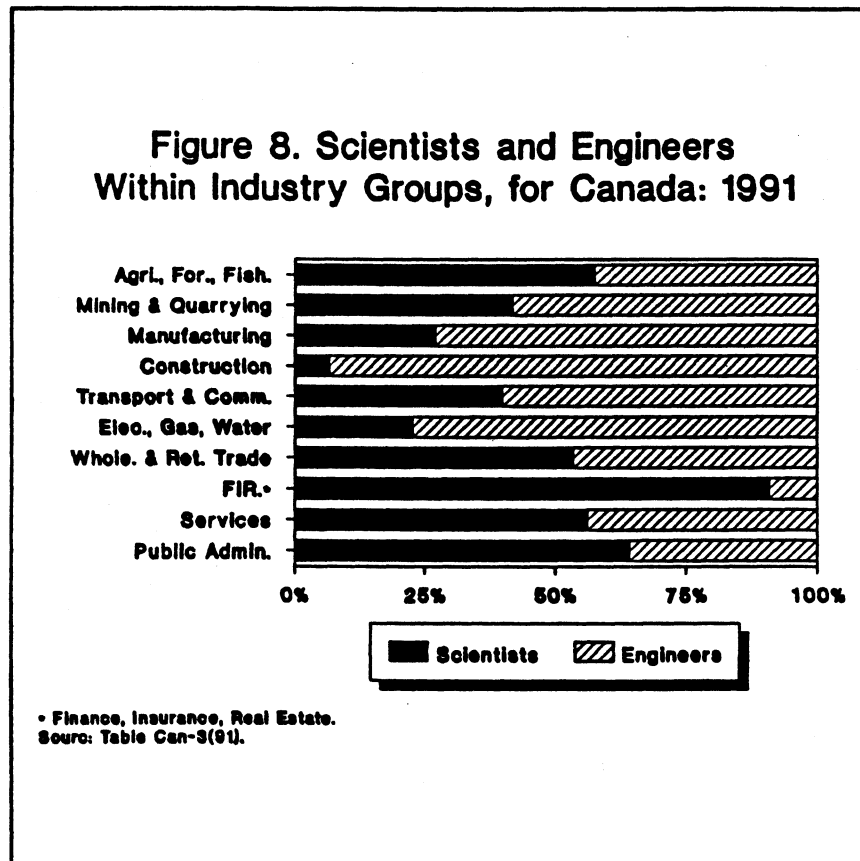
**Figure 7. Scientists and Engineers
by Industry, for Canada: 1991**



* Finance, Insurance, and Real Estate.
Source: Table Can-3(91).

Most industries exhibit a preference for either scientists or engineers.

Most industries exhibit a hiring preference for either scientists or engineers (Figure 8). Since scientists and engineers study different disciplines, and develop different skills, these hiring patterns probably reflect a matching process based on technological considerations. The agriculture,⁵ wholesale and retail trade, finance, insurance and real estate, services and public administration sectors favor scientists. Conversely, the mining and quarrying, manufacturing, construction, transport and communications, and electric, gas and water sectors are skewed towards employment of engineers. In international perspective, Canadian patterns most closely resemble Australia's, especially with regard to the distribution between scientists and engineers in the manufacturing, electric, water and gas, construction, and public administration sectors of the economy (Zaslow, 1995, p. 10). The distribution of scientists and engineers in Canada in these sectors is somewhat less similar to those of Japan and Singapore (Zaslow, 1995 (Japan), p. 8; Zaslow, 1995 (Singapore), p. 10).



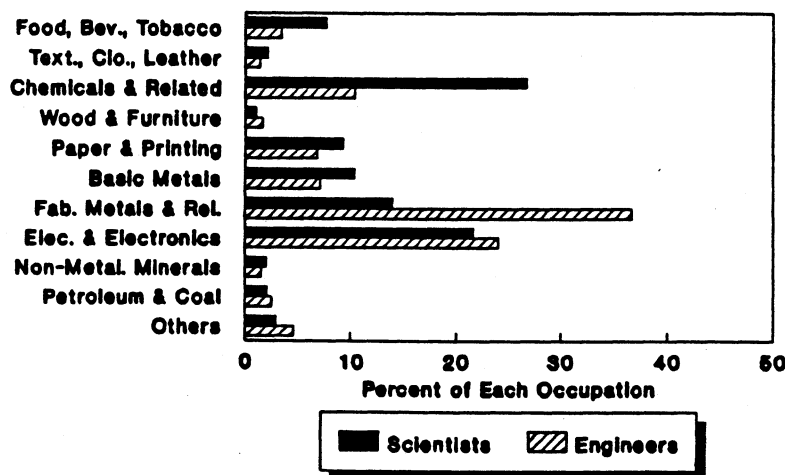
⁵ Agriculture includes the agriculture, forestry and fishing sectors.

The fabricated metals, electrical and electronic products, and chemicals and related products sectors are the largest employers of scientists and engineers in manufacturing.

Employment of scientists and engineers in manufacturing is concentrated within a few industries. Over two-thirds (69 percent) of scientists and engineers engaged in manufacturing work in the fabricated metals, machinery and transportation, electrical and electronics products and chemicals, plastics and rubber industry (Table Can-4(91)). In particular, the two leading employers of S/E among manufacturers, fabricated metals, machinery and transportation, and electrical and electronic products, employ 21,690 engineers and 4,830 scientists (Table Can-4(91), accounting for 60 percent of the former and 36 percent of the latter (Figure 9).

The concentration of scientists and engineers in these categories is linked to technologically intensive export industries. Several Asian automakers, such as Honda and Hyundai, produce vehicles in Canada for the domestic and U.S. markets (Roberti, 1989, p. 36). Likewise, telecommunications equipment is an important export item (*World Factbook 1995*, p. 77). For instance, a Canadian company, Northern Telecom, is the largest foreign supplier of telecommunications equipment to Japan (Symonds, 1992, p. 54).

Figure 9. Scientists and Engineers, by Manufacturing Industry, for Canada: 1991



Source: Table Can-4(91).

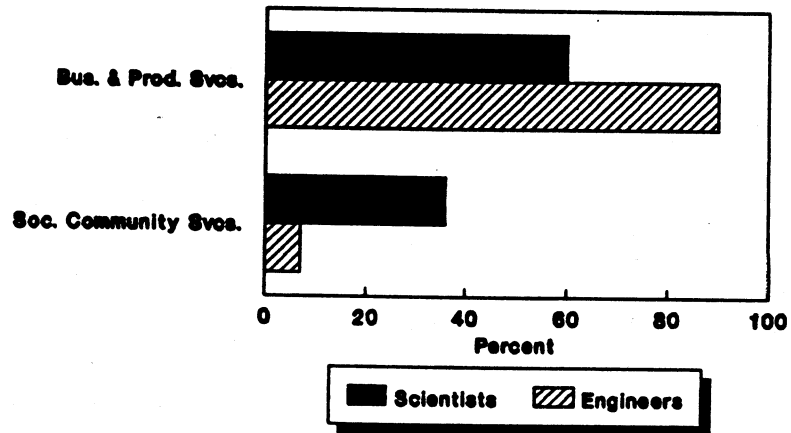
Most scientists and engineers in the services sector work in business-related establishments.

The vast majority (73 percent) of service sector scientists and engineers are employed in the provision of business and production-related services.⁶ Most of the remaining scientists and engineers are engaged in social community services (Table Can-5(91)). Among the employment categories, scientists are more evenly distributed between the two leading employers of S/E than are engineers, 90 percent of whom are engaged in business and production-related services (Figure 10). The remaining three service sectors (personal services, recreation and cultural services, and other services) employ negligible shares of scientists or engineers. Sex selection/role modeling appears to determine the general service sector groups in which a scientist or engineer is likely to work. Males are concentrated in the business and production-related services, while females are far more likely to work in social community services. The latter employs slightly more female S/E than do business and production-related services (Table Can-5(91)).

The pattern of employment among Canadian scientists and engineers working in the service industries is similar to the structure found in Australia. Scientists are primarily employed in the provision of health and social services, while engineers are concentrated among business services (Zaslow, 1995, p. 9).

⁶ Examples are employment agencies, computer-related services, accountants, advertising, consultants, and collection agencies (*Standard Industrial Classification 1980*, 1980, pp. 233-237).

Figure 10. Scientists and Engineers, by Service Industry, for Canada: 1991*



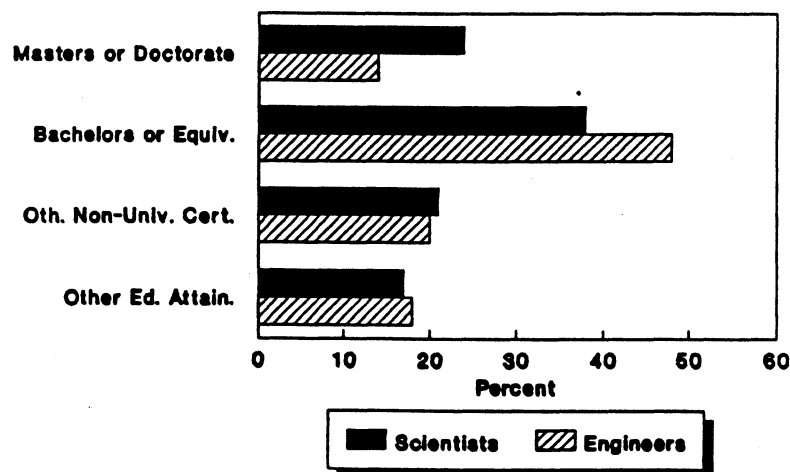
* Per., Rec. & Cult., & Oth. Svcs. are a small pct. of svcs., and are not shown.
Source: Table Can-6(91).

Most scientists and engineers have earned a college degree.

Roughly five-eighths (62 percent) of scientists and engineers have earned a college degree. Of the scientists and engineers who have earned a college degree, most (70 percent) complete their formal education at the baccalaureate level (or equivalent), while the remainder proceed to earn masters or doctoral degrees (Table Can-6(91)). Although the majority of both scientists and engineers with a college degree report a bachelors or equivalent as their highest level of education, scientists are far more likely to have earned an advanced degree than are engineers (Figure 11). Among those lacking a college degree, slightly more than half have some professional certification (often trade school certificates). The remainder are high school graduates or trade school dropouts (Table Can-6(91)).

Cross nationally, similar shares of scientists and engineers report that their formal education did not include at least a bachelors degree. In Japan, a substantially higher share of engineers than scientists reported a high school degree as their highest level of education (Zaslow, 1996, p. 12), while in Australia, vocational schools play a greater role in the training of engineers than scientists (Zaslow, 1995, p. 32).

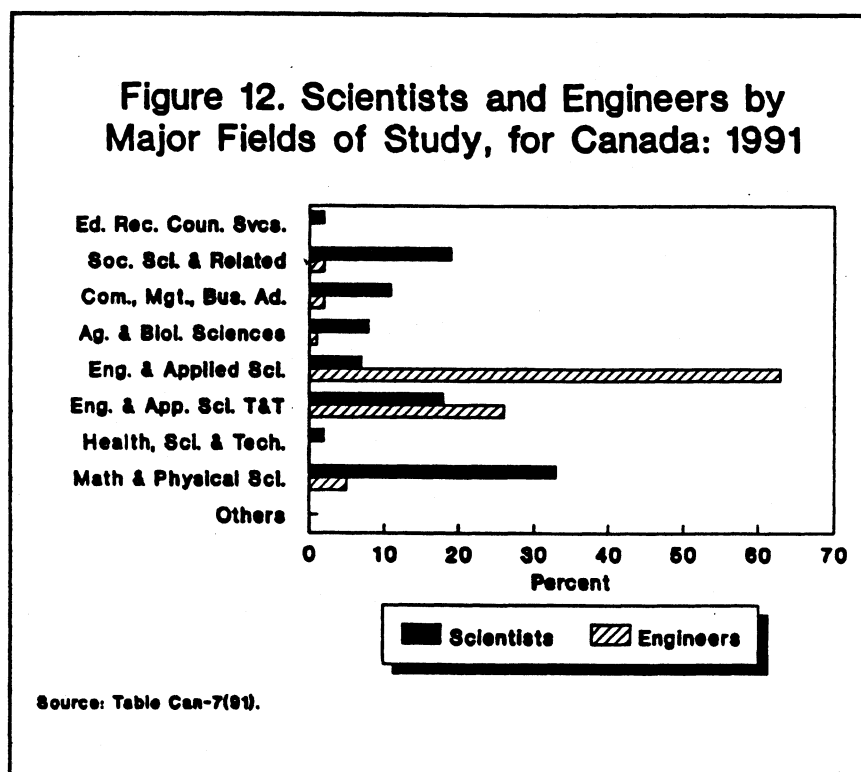
Figure 11. Scientists and Engineers, by Educational Attainment, for Canada: 1991



Most scientists and engineers trained in fields related to their current employment.

Although it is not always possible to link directly an academic discipline with an occupational field, most scientists and engineers studied in fields that relate directly to their occupational requirements (Table Can-7(91)). In 1991, 62 percent of scientists had studied in science-related fields, while 89 percent of engineers had studied in academic fields relating to their employment.⁷ Although Canadian academic categories are not defined as pertaining strictly to either science or engineering, most disciplines are dominated either by scientists or engineers (Figure 12). Scientists were more heavily represented in the engineering educational fields than were engineers in the scientific fields.

This situation whereby scientists and engineers studied in fields that directly relate to their occupations is similar to the educational history of scientists and engineers in Australia, where there are comparatively few scientists or engineers who studied in the alternate discipline (Zaslow, 1995, p. 35).



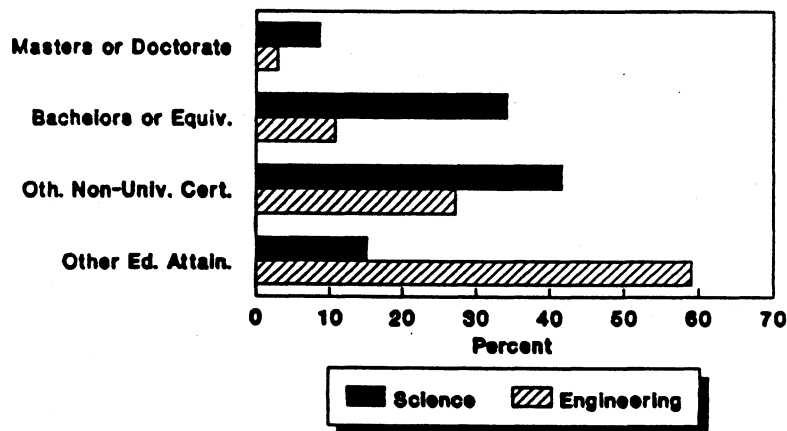
⁷ The disciplines defined as being science-related are: social sciences and related fields, agricultural and biological science, health, science and technology, and math and physical sciences. The engineering-related categories are engineering and applied sciences, and engineering and applied sciences technology and trade. The Canadian classification code did not permit the creation of purely scientific or engineering fields.

Scientists and engineers require considerably more education than the overall Canadian adult population.

As previously indicated, 62 percent of scientists and engineers have earned at least a bachelors or equivalent degree (Table Can-6(91)). This is far higher than the among the nation as a whole. In 1991, just 11 percent of all Canadians who are at least 15 years of age had earned a bachelors or higher degree (*Statistics Canada, 1993, p. 25*). Among all fields of study, the most popular among workers with a post-secondary degree are engineering, applied sciences, technology and trade, representing 41 percent of all post-secondary and higher graduates (Table Can-8(91)).

The distribution between the awarding of bachelors (or equivalent in the case of Canada) degrees in science and engineering is nearly identical in Canada and the United States. In 1991, 78 percent of bachelors degrees in either science or engineering in Canada were awarded for the sciences, compared to 77 percent in the United States for 1989 (Table Can-8(91) and National Science Board, 1991, p. 236).

Figure 13. Employed Labor Force with Post-Secondary Degree, by Fields of Study, for Canada: 1991



Source: Table Can-8(91).

Conclusions

Canada has a lower concentration of scientists and engineers in its workforce than do many leading industrial countries. Canada's scientists and engineers tend to be younger than the country's total labor force, nearly all are employees, and S/E are concentrated in services, public administration and manufacturing. In addition, 62 percent of Canada's scientists and engineers have earned a college degree. Males predominate among scientists and engineers, accounting for 81 percent of S/E. In this respect, as in many others, Canada's sex distribution among scientists and engineers resembles Australia's. Canada's scientist and engineer sex distribution contrasts sharply with that of its overall labor force. The latter is split 55-45, male to female. Female scientists and engineers are far more concentrated in the younger age groups than are males, and unlike males, are concentrated in the sciences.

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Can-1(91)

Table 1. Scientists and Engineers, by Age and Sex, for Canada: 1991

Occupation	Total	Both Sexes									
		Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
TOTAL SCIENTISTS & ENGINEERS*	261,595	14,810	51,250	53,865	44,710	36,840	24,580	15,585	10,545	6,050	3,355
TOTAL SCIENTISTS	128,645	8,255	26,210	28,345	24,240	18,780	11,285	5,680	3,100	1,735	1,005
Biologists and Related Scientists	8,160	685	1,325	1,595	1,720	1,100	720	495	255	185	80
Mathematicians, Statisticians and Actuaries	6,140	715	1,425	1,090	920	890	475	280	210	75	60
Total Physical Science Professionals	21,625	1,180	3,775	4,170	3,710	3,365	2,265	1,350	855	640	315
Physicists and Astronomers	1,900	105	300	310	340	265	245	160	100	60	15
Chemists	9,625	610	1,915	1,730	1,555	1,485	995	555	385	265	135
Geologists, Geochemists and Geophysicists	7,870	285	1,240	1,820	1,550	1,195	670	425	300	245	140
Meteorologists	890	45	125	145	110	210	120	85	15	20	10
Other Professional Occupations in Physical Sciences	1,340	130	195	165	155	205	240	120	55	45	25
Total Social Scientists	18,480	950	2,370	3,330	3,300	3,465	2,440	1,195	710	415	305
Psychologists	9,930	255	1,035	1,655	1,900	2,010	1,485	715	470	215	185
Economists and Economic Policy Researchers and Analysts	5,190	280	785	1,080	865	950	570	310	175	120	55
Other Professional Occupations in Social Science	3,360	415	550	600	530	510	385	170	65	75	60
Computer Systems Analysts	74,235	4,730	17,310	18,165	14,590	9,960	5,380	2,370	1,065	415	250
TOTAL ENGINEERS	132,950	6,550	25,035	25,520	20,470	18,065	13,295	9,905	7,450	4,310	2,345
Civil Engineers	33,370	1,220	5,060	5,920	5,635	4,935	3,550	2,710	2,270	1,270	780
Total Ind./Mech. Engineers	95,125	4,985	19,315	18,825	14,195	12,460	9,300	6,815	4,920	2,845	1,455
Mechanical Engineers	23,545	1,050	4,590	4,180	3,245	2,945	2,650	1,970	1,475	905	530
Electrical and Electronics Engineers	31,655	1,670	6,100	5,960	5,060	4,450	3,165	2,145	1,710	970	410
Computer Engineers	8,965	605	2,750	2,275	1,405	865	490	340	155	50	20
Chemical Engineers	7,675	625	1,645	1,555	915	1,055	740	540	300	185	120
Industrial and Manufacturing Engineers	10,485	375	2,105	2,030	1,455	1,430	1,135	865	640	315	135
Metallurgical and Materials Engineers	1,950	125	335	345	310	230	160	210	85	70	75
Mining Engineers	2,590	105	385	440	355	405	255	230	170	160	75
Petroleum Engineers	4,780	200	705	1,330	925	640	365	285	200	85	40
Aerospace Engineers	3,480	220	690	715	515	435	340	235	190	110	35
Other Professional Engineers	4,455	345	660	775	635	665	440	380	260	190	105

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 Table 1. Scientists and Engineers, by Age and Sex, for Canada: 1991--Continued

Occupation	Total	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
TOTAL SCIENTISTS & ENGINEERS*	212,190	10,765	38,670	42,070	35,690	31,060	21,440	13,965	9,770	5,610	3,150
TOTAL SCIENTISTS	88,000	5,230	16,550	18,485	16,520	13,775	8,505	4,345	2,410	1,360	825
Biologists and Related Scientists	5,270	290	670	945	1,205	845	565	350	215	115	75
Mathematicians, Statisticians and Actuaries	3,725	370	725	675	540	620	330	195	155	55	50
Total Physical Science Professionals	17,520	730	2,730	3,205	3,065	2,910	1,985	1,210	785	590	300
Physicists and Astronomers	1,660	90	235	275	290	235	220	160	85	55	10
Chemists	6,905	275	1,180	1,135	1,170	1,160	800	485	345	250	125
Geologists, Geochemists and Geophysicists	6,930	220	1,020	1,530	1,385	1,115	620	375	285	230	135
Meteorologists	790	40	100	135	85	190	110	80	10	20	10
Other Professional Occupations in Physical Sciences	1,235	100	190	135	135	205	235	115	55	45	25
Total Social Scientists	9,380	400	985	1,540	1,705	1,840	1,400	730	390	230	165
Psychologists	4,070	55	280	560	805	875	725	380	195	115	75
Economists and Economic Policy Researchers and Analysts	3,815	170	520	765	610	720	480	260	135	100	50
Other Professional Occupations in Social Science	1,500	175	180	215	285	240	195	90	60	15	35
Computer Systems Analysts	52,105	3,435	11,435	12,115	10,010	7,555	4,220	1,855	865	370	230
TOTAL ENGINEERS	124,185	5,535	22,120	23,580	19,175	17,285	12,935	9,620	7,355	4,250	2,330
Civil Engineers	31,460	1,005	4,395	5,510	5,340	4,785	3,475	2,655	2,260	1,255	780
Total Ind./Mech. Engineers	88,545	4,210	17,140	17,370	13,245	11,870	9,030	6,600	4,840	2,810	1,440
Mechanical Engineers	22,725	970	4,275	4,035	3,165	2,845	2,610	1,995	1,460	910	525
Electrical and Electronics Engineers	29,560	1,400	5,490	5,510	4,735	4,265	3,075	2,060	1,680	940	410
Computer Engineers	7,930	515	2,385	2,045	1,245	765	455	305	140	55	25
Chemical Engineers	6,780	470	1,330	1,365	780	1,010	700	525	295	175	115
Industrial and Manufacturing Engineers	9,530	290	1,780	1,820	1,315	1,330	1,090	830	625	315	135
Metallurgical and Materials Engineers	1,820	100	305	320	300	195	160	205	90	65	75
Mining Engineers	2,490	90	340	435	335	390	255	230	170	160	80
Petroleum Engineers	4,410	175	625	1,165	850	640	365	280	190	80	40
Aerospace Engineers	3,290	190	615	665	505	425	320	235	185	110	35
Other Professional Engineers	4,180	325	590	695	590	635	430	370	260	180	110

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Table 1. Scientists and Engineers, by Age and Sex, for Canada: 1991--Continued

Occupation	Total	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
TOTAL SCIENTISTS & ENGINEERS*	49,410	4,045	12,575	11,800	9,015	5,780	3,140	1,620	775	440	200
TOTAL SCIENTISTS	40,645	3,030	9,660	9,855	7,720	5,010	2,780	1,340	685	375	185
Biologists and Related Scientists	2,890	400	660	650	515	250	155	145	45	65	10
Mathematicians, Statisticians and Actuaries	2,420	345	700	415	385	270	145	80	55	15	10
Total Physical Science Professionals	4,110	445	1,050	955	645	460	275	140	65	55	15
Physicists and Astronomers	240	15	70	35	45	30	20	0	10	0	10
Chemists	2,725	335	730	595	385	325	195	75	40	35	0
Geologists, Geochemists and Geophysicists	940	65	220	290	170	80	45	45	15	10	10
Meteorologists	105	10	25	10	20	15	10	0	10	0	0
Other Professional Occupations in Physical Sciences	100	30	10	30	20	0	10	10	0	0	0
Total Social Scientists	9,100	545	1,385	1,790	1,595	1,625	1,040	460	320	185	140
Psychologists	5,860	200	750	1,090	1,100	1,135	760	330	270	105	110
Economists and Economic Policy Researchers and Analysts	1,375	110	265	315	250	225	90	45	45	20	10
Other Professional Occupations in Social Science	1,860	235	370	385	240	270	190	80	0	65	20
Computer Systems Analysts	22,135	1,290	5,870	6,045	4,580	2,400	1,160	515	195	55	15
TOTAL ENGINEERS	8,760	1,020	2,915	1,940	1,295	770	360	280	95	60	15
Civil Engineers	1,910	215	670	410	295	150	80	55	10	15	0
Total Ind./Mech. Engineers	6,580	775	2,175	1,450	955	595	275	210	80	40	20
Mechanical Engineers	820	75	315	140	80	105	40	30	15	0	10
Electrical and Electronics Engineers	2,095	270	610	455	325	190	95	85	30	25	0
Computer Engineers	1,035	85	365	230	160	100	35	35	15	0	0
Chemical Engineers	895	160	315	185	130	40	35	15	0	0	0
Industrial and Manufacturing Engineers	955	85	325	210	135	95	45	35	10	10	0
Metallurgical and Materials Engineers	125	20	35	20	10	30	0	10	0	0	0
Mining Engineers	100	15	45	0	20	15	0	0	0	0	0
Petroleum Engineers	370	30	80	165	70	0	0	0	0	0	0
Aerospace Engineers	185	30	75	45	15	10	10	0	0	0	0
Other Professional Engineers	275	25	70	75	45	30	10	10	0	10	0

* Totals may not equal due to "random rounding," to provide confidentiality of data.

Source: Special tabulation from 1991 Census, Statistics Canada.

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 Table 2. Scientists and Engineers, by Class of Worker and Sex, for Canada: 1991

Occupation	Total	Total Self-Emp.	Self-Emp. w/o Paid Help	Self-Emp. w/ Paid Help	Total Employees	Unpaid Family Workers	Both Sexes	
							Paid Employees	Unpaid Family Workers
TOTAL SCIENTISTS & ENGINEERS*	261,595	12,210	9,945	2,265	249,385	25	249,355	
TOTAL SCIENTISTS	128,645	8,125	6,910	1,215	120,520	25	120,500	
Biologists and Related Scientists	8,160	305	215	90	7,855	0	7,855	
Mathematicians, Statisticians and Actuaries	6,140	125	110	15	6,015	0	6,015	
Total Physical Science Professionals	21,630	825	665	155	20,805	0	20,800	
Physicists and Astronomers	1,900	110	100	10	1,790	0	1,790	
Chemists	9,625	155	125	35	9,470	0	9,460	
Geologists, Geochemists and Geophysicists	7,870	515	420	100	7,355	0	7,350	
Meteorologists	890	15	10	10	875	0	875	
Other Professional Occupations in Physical Sciences	1,335	20	20	0	1,315	0	1,315	
Total Social Scientists	18,485	2,640	2,205	435	15,840	10	15,835	
Psychologists	9,930	2,120	1,780	340	7,805	10	7,795	
Economists and Economic Policy Researchers and Analysts	5,190	200	145	50	4,990	0	4,995	
Other Professional Occupations in Social Science	3,360	315	280	40	3,040	0	3,045	
Computer Systems Analysts	74,235	4,230	3,700	520	70,010	10	69,995	
TOTAL ENGINEERS	132,950	4,085	3,035	1,045	128,860	10	128,860	
Civil Engineers	33,365	1,155	800	350	32,210	0	32,210	
Total Ind./Mech. Engineers	95,125	2,765	2,115	655	92,355	10	92,350	
Mechanical Engineers	23,550	885	655	230	22,660	10	22,660	
Electrical and Electronics Engineers	31,650	825	675	145	30,830	0	30,830	
Computer Engineers	8,965	280	220	55	8,685	0	8,680	
Chemical Engineers	7,675	210	175	35	7,465	0	7,465	
Industrial and Manufacturing Engineers	10,490	220	145	80	10,265	0	10,265	
Metallurgical and Materials Engineers	1,950	55	25	25	1,895	0	1,895	
Mining Engineers	2,585	155	110	45	2,430	0	2,435	
Petroleum Engineers	4,775	105	75	30	4,670	0	4,670	
Aerospace Engineers	3,480	30	20	15	3,450	0	3,445	
Other Professional Engineers	4,455	160	125	35	4,295	0	4,295	

Table 2. Scientists and Engineers, by Class of Worker and Sex, for Canada: 1991--Continued

Male

Occupation	Total	Total Self-Emp.	Self-Emp. w/o Paid Help	Self-Emp. w/ Paid Help	Total Employees	Unpaid Family Workers	Paid Employees
TOTAL SCIENTISTS & ENGINEERS*	212,190	9,195	7,285	1,910	202,995	20	202,970
TOTAL SCIENTISTS	88,000	5,255	4,380	880	82,740	15	82,730
Biologists and Related Scientists	5,270	185	125	60	5,085	0	5,080
Mathematicians, Statisticians and Actuaries	3,725	95	80	15	3,630	0	3,630
Total Physical Science Professionals	17,520	655	515	140	16,865	0	16,865
Physicists and Astronomers	1,655	45	40	0	1,610	0	1,610
Chemists	6,905	105	75	30	6,795	0	6,795
Geologists, Geochemists and Geophysicists	6,930	460	365	90	6,470	0	6,475
Meteorologists	785	15	0	10	770	0	770
Other Professional Occupations in Physical Sciences	1,235	20	20	0	1,215	0	1,215
Total Social Scientists*	9,380	1,100	860	235	8,285	0	8,280
Psychologists	4,070	765	580	185	3,305	10	3,305
Economists and Economic Policy Researchers and Analysts	3,815	170	130	45	3,645	0	3,645
Other Professional Occupations in Social Science	1,500	165	150	15	1,335	0	1,335
Computer Systems Analysts	52,105	3,225	2,800	425	48,880	10	48,870
TOTAL ENGINEERS	124,185	3,935	2,905	1,030	120,245	10	120,245
Civil Engineers	31,455	1,110	755	350	30,350	0	30,350
Total Ind./Mech. Engineers	88,545	2,680	2,040	645	85,870	0	85,860
Mechanical Engineers	22,725	850	625	220	21,875	10	21,870
Electrical and Electronics Engineers	29,560	810	660	150	28,755	0	28,750
Computer Engineers	7,925	255	200	55	7,670	0	7,670
Chemical Engineers	6,785	210	175	35	6,570	0	6,570
Industrial and Manufacturing Engineers	9,535	205	140	65	9,325	0	9,325
Metallurgical and Materials Engineers	1,820	55	25	25	1,765	0	1,770
Mining Engineers	2,490	155	110	45	2,335	0	2,335
Petroleum Engineers	4,410	105	80	30	4,305	0	4,300
Aerospace Engineers	3,295	30	20	15	3,260	0	3,260
Other Professional Engineers	4,180	150	110	40	4,035	0	4,030

Table 2. Scientists and Engineers by Class of Worker and Sex, for Canada: 1991--Continued

Occupation	Male					Female								
	Total	Total Self-Emp.	Self-Emp. w/o Paid Help	Self-Emp. w/ Paid Help	Total Employees	Unpaid Family Workers	Paid Employees	Total	Total Self-Emp.	Self-Emp. w/o Paid Help	Self-Emp. w/ Paid Help	Total Employees	Unpaid Family Workers	Paid Employees
TOTAL SCIENTISTS & ENGINEERS*	49,405	3,015	2,660	350	46,395	10	46,385							
TOTAL SCIENTISTS	40,645	2,865	2,530	335	37,780	10	37,770							
Biologists and Related Scientists	2,890	115	90	30	2,770	0	2,770							
Mathematicians, Statisticians and Actuaries	2,415	30	30	0	2,385	0	2,385							
Total Physical Science Professionals	4,105	175	155	15	3,935	10	3,930							
Physicists and Astronomers	245	65	55	10	180	0	180							
Chemists	2,725	50	50	0	2,670	0	2,665							
Geologists, Geochemists and Geophysicists	940	55	50	0	880	0	880							
Meteorologists	100	0	0	0	105	0	105							
Other Professional Occupations in Physical Sciences	100	0	0	0	100	0	100							
Total Social Scientists	9,100	1,540	1,350	195	7,555	0	7,550							
Psychologists	5,860	1,360	1,200	165	4,500	0	4,495							
Economists and Economic Policy Researchers and Analysts	1,380	30	15	10	1,350	0	1,345							
Other Professional Occupations in Social Science	1,865	155	130	25	1,710	0	1,710							
Computer Systems Analysts	22,130	1,000	905	100	21,130	0	21,130							
TOTAL ENGINEERS	8,760	145	130	15	8,615	0	8,615							
Civil Engineers	1,910	45	45	0	1,860	0	1,860							
Total Ind./Mech. Engineers	6,580	90	75	15	6,490	0	6,490							
Mechanical Engineers	820	35	30	0	790	0	790							
Electrical and Electronics Engineers	2,095	20	15	0	2,080	0	2,075							
Computer Engineers	1,030	25	25	0	1,010	0	1,010							
Chemical Engineers	895	0	0	0	895	0	895							
Industrial and Manufacturing Engineers	950	10	0	10	940	0	940							
Metallurgical and Materials Engineers	125	0	0	0	130	0	130							
Mining Engineers	95	0	0	0	100	0	95							
Petroleum Engineers	365	0	0	0	370	0	365							
Aerospace Engineers	185	0	0	0	185	0	185							
Other Professional Engineers	270	10	10	0	260	0	260							

* Totals may not equal due to "random rounding." to provide confidentiality of data.

Source: Special tabulation of Statistics Canada, based on 1991 Census.

Table 3. Scientists and Engineers, by Industry and Sex, for Canada: 1991

Occupation	Total	Agri., Forestry, Fishing	Mining & Quarrying	Manufac- turing	Construc- tion	Transport & Commun.	Electric, Gas & Water	Wholesale & Retail Trade	Finance, Insur., and Real Est.	Services	Public Admin.
TOTAL SCIENTISTS & ENGINEERS*	261,595	945	12,045	49,755	6,395	15,765	13,025	9,465	13,910	101,565	38,775
TOTAL SCIENTISTS	128,645	545	5,050	13,560	435	6,300	2,965	5,080	12,660	57,155	24,920
Biologists and Related Scientists	8,160	200	25	435	15	35	65	85	20	3,900	3,380
Mathematicians, Statisticians and Actuaries	6,140	10	30	425	10	250	115	35	1,510	1,800	1,870
Total Physical Science Professionals	21,625	85	3,190	4,470	60	205	480	415	70	8,350	4,310
Physicists and Astronomers	1,900	0	0	180	10	25	105	65	0	990	520
Chemists	9,625	55	230	3,610	25	80	200	305	30	3,270	1,795
Geologists, Geochemists and Geophysicists	7,870	30	2,810	170	10	45	115	15	30	3,520	1,135
Meteorologists	890	0	10	15	0	40	10	10	0	210	585
Other Professional Occupations in Physical Sciences	1,335	0	135	480	20	20	45	20	10	335	275
Total Social Scientists	18,480	40	145	390	15	285	175	180	565	12,165	4,535
Psychologists	9,925	10	10	20	0	0	15	20	60	9,080	710
Economists and Economic Policy Researchers and Analysts	5,195	15	140	310	10	255	150	145	495	940	2,730
Other Professional Occupations in Social Science	3,360	10	0	55	10	30	10	10	10	2,140	1,095
Computer Systems Analysts	74,235	210	1,660	7,840	325	5,525	2,135	4,365	10,485	30,860	10,830
TOTAL ENGINEERS	132,950	400	7,000	36,195	5,960	9,460	10,060	4,390	1,250	44,400	13,855
Civil Engineers	33,365	125	490	1,905	3,505	1,790	1,655	310	245	15,825	7,530
Total Ind./Mech. Engineers	95,125	245	6,480	33,250	2,415	7,540	8,290	3,965	960	26,810	5,170
Mechanical Engineers	23,545	75	725	8,870	1,020	755	1,890	855	260	7,835	1,250
Electrical and Electronics Engineers	31,650	75	450	8,115	790	5,060	5,335	1,225	275	8,665	1,675
Computer Engineers	8,960	20	60	2,160	65	665	255	755	250	4,210	530
Chemical Engineers	7,680	40	820	3,325	175	170	320	300	30	1,935	550
Industrial and Manufacturing Engineers	10,485	15	200	6,930	185	365	280	505	80	1,435	510
Metallurgical and Materials Engineers	1,950	0	165	915	80	50	90	45	0	475	120
Mining Engineers	2,585	10	1,410	220	15	0	25	10	10	780	95
Petroleum Engineers	4,780	10	2,650	400	75	135	90	155	40	1,100	115
Aerospace Engineers	3,480	0	0	2,325	10	320	10	110	10	385	320
Other Professional Engineers	4,455	30	35	1,040	35	135	110	115	45	1,760	1,155

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Table 3. Scientists and Engineers by Industry and Sex, for Canada: 1991--Continued

Occupation	Total	Agri., Forestry, Fishing	Mining & Quarrying	Manufac- turing	Constrec- tion	Transport & Commun.	Electric, Gas & Water	Whole- & Ret. Trade	Finance, Insurance, and Real Est.	Services	Public Admin.
TOTAL SCIENTISTS & ENGINEERS*	212,190	755	10,615	44,110	6,095	13,105	11,650	7,640	8,570	79,395	30,310
TOTAL SCIENTISTS	88,000	385	4,130	10,135	365	4,450	2,155	3,570	7,500	37,910	17,420
Biologists and Related Scientists	5,270	150	20	195	10	30	55	10	0	2,255	2,540
Mathematicians, Statisticians and Actuaries	3,725	10	20	225	10	165	100	15	895	1,155	1,120
Total Physical Science Professionals	17,520	60	2,800	3,510	60	180	390	320	55	6,650	3,490
Physicists and Astronomers	1,655	0	0	175	10	25	100	30	0	865	465
Chemists	6,900	45	175	2,705	20	60	160	250	25	2,205	1,250
Geologists, Geochemists and Geophysicists	6,935	20	2,485	155	10	45	80	10	35	3,095	995
Meteorologists	785	0	10	15	0	30	10	15	0	190	525
Other Professional Occupations in Physical Sciences	1,240	0	130	455	20	20	40	15	0	280	260
Total Social Scientists	9,385	30	105	255	10	190	140	120	350	5,130	3,055
Psychologists	4,070	0	0	15	0	0	10	10	45	3,595	405
Economists and Economic Policy Researchers and Analysts	3,815	20	95	220	10	185	125	110	310	725	2,005
Other Professional Occupations in Social Science	1,500	10	0	20	0	0	0	0	0	820	645
Computer Systems Analysts	52,105	130	1,180	5,950	265	3,890	1,470	3,105	6,190	22,715	7,215
TOTAL ENGINEERS	124,185	370	6,480	33,975	5,735	8,650	9,500	4,065	1,065	41,480	12,890
Civil Engineers	31,455	110	445	1,825	3,405	1,700	1,610	275	215	14,810	7,065
Total Ind./Mech. Engineers	88,545	230	6,000	31,195	2,290	6,825	7,785	3,685	805	25,020	4,725
Mechanical Engineers	22,725	75	690	8,630	1,005	725	1,770	815	260	7,565	1,205
Electrical and Electronics Engineers	29,560	75	445	7,625	740	4,545	5,025	1,160	235	8,170	1,565
Computer Engineers	7,930	20	55	1,950	60	570	245	680	185	3,695	480
Chemical Engineers	6,785	40	745	2,960	165	170	295	285	20	1,660	440
Industrial and Manufacturing Engineers	9,530	0	185	6,400	165	315	250	435	45	1,290	430
Metallurgical and Materials Engineers	1,820	0	150	850	65	50	85	45	0	460	105
Mining Engineers	2,485	0	1,330	215	15	10	25	15	0	765	90
Petroleum Engineers	4,410	10	2,400	395	65	125	85	150	40	1,030	105
Aerospace Engineers	3,290	0	0	2,175	10	320	0	110	0	365	305
Other Professional Engineers	4,180	25	35	955	40	125	105	110	45	1,640	1,095

Male

230 + 240's
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Table 3. Scientists and Engineers, by Industry and Sex, for Canada: 1991--Continued

Occupation	Total	Agri., Forestry, Fishing	Mining & Quarrying	Manufac- turing	Construc- tion	Transport & Commun.	Electric, Gas & Water	Whole- & Ret. Trade	Finance, Insurance, and Real Est.	Services	Female	Public Admin.
											Public Admin.	
TOTAL SCIENTISTS & ENGINEERS*	49,410	190	1,440	5,645	295	2,660	1,375	1,830	5,345	22,175	8,470	8,470
TOTAL SCIENTISTS	40,645	160	915	3,425	75	1,850	810	1,510	5,160	19,245	7,500	7,500
Biologists and Related Scientists	2,890	50	10	245	0	0	10	75	0	1,640	835	835
Mathematicians, Statisticians and Actuaries	2,420	0	10	200	0	80	10	20	620	720	745	745
Total Physical Science Professionals	4,110	25	390	955	10	30	85	95	15	1,695	820	820
Physicists and Astronomers	240	0	0	10	0	0	10	30	0	140	50	50
Chemists	2,720	10	55	910	0	20	45	55	10	1,065	545	545
Geologists, Geochemists and Geophysicists	940	10	325	10	0	0	30	10	0	415	140	140
Meteorologists	100	0	0	0	0	10	0	0	0	25	60	60
Other Professional Occupations in Physical Sciences	100	0	10	20	0	0	0	0	0	50	15	15
Total Social Scientists	9,100	10	40	130	0	95	35	60	210	7,030	1,480	1,480
Psychologists	5,860	10	0	10	0	0	10	15	25	5,490	305	305
Economists and Economic Policy Researchers and Analysts	1,375	0	40	85	0	65	25	35	180	725	725	725
Other Professional Occupations in Social Science	1,860	0	0	35	10	20	0	10	10	1,320	450	450
Computer Systems Analysts	22,130	80	475	1,890	60	1,640	665	1,255	4,295	8,140	3,615	3,615
TOTAL ENGINEERS	8,760	30	520	2,220	220	810	565	320	180	2,915	970	970
Civil Engineers	1,910	15	35	80	100	90	50	30	20	1,010	460	460
Total Ind./Mech. Engineers	6,580	15	480	2,060	125	715	505	280	150	1,795	450	450
Mechanical Engineers	820	0	35	245	20	35	125	45	10	265	45	45
Electrical and Electronics Engineers	2,095	0	0	485	50	520	310	70	35	500	110	110
Computer Engineers	1,035	0	10	210	10	90	10	75	65	505	50	50
Chemical Engineers	895	0	75	360	15	0	30	20	10	275	110	110
Industrial and Manufacturing Engineers	950	10	10	525	15	50	30	65	35	135	80	80
Metallurgical and Materials Engineers	130	0	15	65	15	0	10	0	0	10	15	15
Mining Engineers	100	0	75	0	0	0	0	0	0	15	10	10
Petroleum Engineers	370	0	255	10	0	10	0	10	0	60	15	15
Aerospace Engineers	185	0	0	150	0	10	0	0	0	20	15	15
Other Professional Engineers	270	0	0	80	0	0	0	0	0	115	55	55

* Totals may differ from those for "random rounding" to ensure consistency of census data.

Source: Special tabulations from 1991 Census, Statistics Canada.

Table 4. Scientists and Engineers, by Manufacturing Industry and Sex, for Canada: 1991

Occupation	Total	Food, Bev., Tobacco	Textiles, Clothing, Leather	Chem., Plastic, and Rubber	Wood 'and' Furniture	Paper and Printing	Basic Metals	Fab. Met., Machinery, and Trans.	Elec. and Electron. Prods.	Non- Metallic Mins.	Petrol. and Coal	Other Mfg.
TOTAL SCIENTISTS & ENGINEERS*	49,760	2,275	780	7,390	730	3,735	3,990	15,160	11,625	825	1,180	2,050
TOTAL SCIENTISTS	13,560	1,045	290	3,630	140	1,265	1,410	1,895	2,935	270	280	395
Biologists and Related Scientists	435	105	0	280	0	25	10	10	10	10	10	0
Mathematicians, Statisticians and Actuaries	425	35	10	55	10	130	45	100	35	10	10	0
Total Physical Science Professionals	4,470	345	70	2,355	10	165	615	385	190	110	100	125
Physicists and Astronomers	180	10	0	20	0	10	0	35	60	0	0	45
Chemists	3,610	330	70	2,290	0	140	210	225	115	85	70	75
Geologists, Geochemists and Geophysicists	170	10	0	25	0	10	80	20	10	10	25	0
Meteorologists	15	0	0	0	10	0	0	10	0	0	0	0
Other Professional Occupations in Physical Sciences	480	0	0	20	0	10	330	90	15	15	0	0
Total Social Scientists	390	20	10	70	0	100	0	75	70	10	20	20
Psychologists	25	0	0	0	0	0	0	0	0	0	0	0
Economists and Economic Policy Researchers and Analysts	310	0	10	60	0	65	0	70	50	10	20	20
Other Professional Occupations in Social Science	55	0	0	10	10	30	0	0	10	0	0	0
Computer Systems Analysts	7,845	550	205	870	125	850	745	1,325	2,635	145	145	250
TOTAL ENGINEERS	36,195	1,225	490	3,760	585	2,470	2,585	13,270	8,690	555	905	1,650
Civil Engineers	1,905	60	0	200	115	230	205	810	115	65	35	65
Total Ind./Mech. Engineers	33,255	910	420	3,530	455	2,230	2,350	11,975	8,535	465	860	1,530
Mechanical Engineers	8,870	345	105	710	125	660	520	5,145	755	130	70	300
Electrical and Electronics Engineers	8,110	135	65	265	60	435	230	1,475	4,825	40	80	495
Computer Engineers	2,160	20	0	85	40	85	70	225	1,470	0	20	130
Chemical Engineers	3,325	55	60	1,620	25	590	245	210	50	70	325	70
Industrial and Manufacturing Engineers	6,930	355	175	730	200	450	570	2,840	1,100	160	45	290
Metallurgical and Materials Engineers	915	0	0	55	0	10	545	225	35	45	0	10
Mining Engineers	215	0	0	0	0	0	155	20	15	15	0	10
Petroleum Engineers	400	0	0	45	0	0	0	35	10	0	310	10
Aerospace Engineers	2,325	0	10	15	0	0	10	1,800	275	0	0	220
Other Professional Engineers	1,035	260	65	35	10	15	30	480	40	25	15	50

Table 4. Scientists and Engineers, by Manufacturing Industry and Sex, for Canada: 1991--Continued

Occupation	Total	Food, Bev., Tobacco	Textiles, Clothing, Leather	Chem., Plastic, and Rubber	Wood and Furniture	Paper and Printing	Basic Metals	Fab. Met., Machinery, and Trans.	Elec. and Electron. Prods.	Non- Metallic Mins.	Petrol. and Coal	Male
												Other Mfg.
TOTAL SCIENTISTS & ENGINEERS*	44,110	1,880	655	6,020	675	3,215	3,625	14,175	10,230	705	1,065	1,860
TOTAL SCIENTISTS	10,135	725	220	2,570	110	885	1,180	1,505	2,190	235	200	310
Biologists and Related Scientists	190	60	0	110	0	0	0	10	0	0	0	0
Mathematicians, Statisticians and Actuaries	225	25	0	25	0	45	45	60	0	0	0	0
Total Physical Science Professionals	3,510	225	60	1,730	10	140	570	335	125	105	80	120
Physicists and Astronomers	170	10	0	20	10	0	0	35	50	0	0	45
Chemists	2,705	210	60	1,670	0	115	190	180	60	80	55	70
Geologists, Geochemists and Geophysicists	160	0	0	20	0	10	75	20	10	10	20	0
Meteorologists	15	0	0	0	0	0	0	10	0	0	0	0
Other Professional Occupations in Physical Sciences	460	0	0	20	0	10	310	90	15	15	0	0
Total Social Scientists	260	10	0	40	0	60	0	55	55	10	25	15
Psychologists	15	0	0	0	0	0	0	10	10	0	0	0
Economists and Economic Policy Researchers and Analysts	225	10	0	35	0	50	0	50	45	0	25	15
Other Professional Occupations in Social Science	15	10	0	0	10	10	0	0	0	0	0	0
Computer Systems Analysts	5,955	410	155	660	95	640	555	1,040	2,005	120	90	180
TOTAL ENGINEERS	33,975	1,150	435	3,445	560	2,330	2,440	12,675	8,040	470	865	1,545
Civil Engineers	1,820	60	0	185	120	215	195	795	110	55	25	65
Total Ind./Mech. Engineers	31,195	870	375	3,235	435	2,095	2,215	11,420	7,895	390	820	1,440
Mechanical Engineers	8,630	345	100	690	120	655	500	4,990	745	125	75	280
Electrical and Electronics Engineers	7,625	135	65	255	60	425	210	1,395	4,500	40	80	460
Computer Engineers	1,950	10	10	85	30	70	60	210	1,325	0	20	130
Chemical Engineers	2,960	45	50	1,415	25	545	210	190	45	70	305	60
Industrial and Manufacturing Engineers	6,400	335	150	675	185	390	550	2,690	990	125	40	265
Metallurgical and Materials Engineers	845	0	0	50	10	0	520	200	40	15	0	10
Mining Engineers	215	0	0	10	0	0	155	25	15	10	0	10
Petroleum Engineers	395	0	0	45	0	0	0	35	0	0	300	0
Aerospace Engineers	2,175	0	10	10	0	0	0	1,680	240	0	0	220
Other Professional Engineers	955	230	60	25	15	15	30	460	40	25	15	40

Table 5. Scientists and Engineers, by Service Industry and Sex, for Canada: 1991

Both
Sexes

Occupation	Total	Business and Prod.- Rel. Svcs.	Social Community Services	Personal Services	Recreation and Cultural Services	Other Services
TOTAL SCIENTISTS & ENGINEERS*	101,565	74,185	23,980	1,360	645	1,395
TOTAL SCIENTISTS	57,155	34,415	20,740	865	385	750
Biologists and Related Scientists	3,900	1,250	2,475	10	75	90
Mathematicians, Statisticians and Actuaries	1,880	1,320	475	50	20	15
Total Physical Science Professionals	8,350	4,920	3,220	115	30	65
Physicists and Astronomers	990	345	575	50	10	10
Chemists	3,270	1,065	2,165	15	0	25
Geologists, Geochemists and Geophysicists	3,520	3,105	365	20	10	20
Meteorologists	210	195	15	0	0	0
Other Professional Occupations in Physical Sciences	335	200	100	25	0	10
Total Social Scientists	12,165	1,385	10,225	365	15	175
Psychologists	9,080	260	8,670	130	0	20
Economists and Economic Policy Researchers and Analysts	940	665	145	120	0	10
Other Professional Occupations in Social Science	2,140	465	1,405	120	10	140
Computer Systems Analysts	30,860	25,535	4,345	330	250	400
TOTAL ENGINEERS	44,400	39,770	3,235	490	260	645
Civil Engineers	15,825	14,825	700	150	40	110
Total Ind./Mech. Engineers	26,810	23,780	2,005	305	190	530
Mechanical Engineers	7,835	6,895	665	120	25	130
Electrical and Electronics Engineers	8,665	7,605	695	90	130	145
Computer Engineers	4,210	3,905	225	30	10	40
Chemical Engineers	1,935	1,720	175	10	0	30
Industrial and Manufacturing Engineers	1,435	1,215	115	40	20	45
Metallurgical and Materials Engineers	475	390	70	0	0	15
Mining Engineers	780	735	25	10	10	0
Petroleum Engineers	1,100	1,070	15	0	0	15
Aerospace Engineers	385	250	15	0	0	120
Other Professional Engineers	1,760	1,170	530	30	30	0

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 Table 5. Scientists and Engineers, by Service Industry and Sex, for Canada: 1991--Continued

Occupation	Total	Business and Prod.- Rel. Svcs.	Social Community Services	Personal Services	Recreation and Cultural Services	Other Services
TOTAL SCIENTISTS & ENGINEERS*	79,395	63,550	13,275	970	520	1,080
TOTAL SCIENTISTS	37,910	26,240	10,405	520	265	480
Biologists and Related Scientists	2,255	865	1,285	10	35	60
Mathematicians, Statisticians and Actuaries	1,155	920	165	30	25	15
Total Physical Science Professionals	6,650	4,300	2,280	20	15	35
Physicists and Astronomers	865	305	530	10	10	10
Chemists	2,205	820	1,375	0	0	10
Geologists, Geochemists and Geophysicists	3,095	2,800	275	10	0	10
Meteorologists	190	175	15	0	0	0
Other Professional Occupations in Physical Sciences	280	200	80	0	0	0
Total Social Scientists	5,130	885	3,950	220	0	75
Psychologists	3,595	110	3,410	65	0	10
Economists and Economic Policy Researchers and Analysts	725	540	75	100	0	10
Other Professional Occupations in Social Science	820	235	465	55	0	65
Computer Systems Analysts	22,715	19,265	2,730	235	195	290
TOTAL ENGINEERS	41,480	37,310	2,865	450	255	600
Civil Engineers	14,810	13,930	590	145	40	105
Total Ind./Mech. Engineers	25,020	22,255	1,810	280	185	490
Mechanical Engineers	7,565	6,675	640	110	25	115
Electrical and Electronics Engineers	8,170	7,195	630	85	130	130
Computer Engineers	3,695	3,430	200	20	10	35
Chemical Engineers	1,660	1,485	135	10	0	30
Industrial and Manufacturing Engineers	1,290	1,100	95	40	15	40
Metallurgical and Materials Engineers	460	385	65	0	0	10
Mining Engineers	765	720	25	10	10	0
Petroleum Engineers	1,030	1,015	0	0	0	15
Aerospace Engineers	365	240	15	0	0	110
Other Professional Engineers	1,640	1,125	465	25	25	0

Male

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 Table 5. Scientists and Engineers, by Service Industry and Sex, for Canada: 1991--Continued

Occupation	Total	Male					Female				
		Business and Prod.-Rel. Svcs.	Social Community Services	Personal Services	Recreation and Cultural Services	Other Services	Business and Prod.-Rel. Svcs.	Social Community Services	Personal Services	Recreation and Cultural Services	Other Services
TOTAL SCIENTISTS & ENGINEERS*	22,175	10,635	10,705	385	130	320					
TOTAL SCIENTISTS	19,245	8,175	10,335	345	120	270					
Biologists and Related Scientists	1,640	380	1,190	0	40	30					
Mathematicians, Statisticians and Actuaries	720	395	310	15	0	0					
Total Physical Science Professionals	1,695	615	940	95	10	35					
Physicists and Astronomers	140	40	45	45	10	0					
Chemists	1,065	250	790	10	0	15					
Geologists, Geochemists and Geophysicists	415	305	85	15	0	10					
Meteorologists	25	25	0	0	0	0					
Other Professional Occupations in Physical Sciences	50	0	20	30	0	0					
Total Social Scientists	7,030	500	6,280	140	15	95					
Psychologists	5,490	150	5,265	60	0	15					
Economists and Economic Policy Researchers and Analysts	225	120	70	25	0	10					
Other Professional Occupations in Social Science	1,320	230	940	60	15	75					
Computer Systems Analysts	8,140	6,270	1,610	90	60	110					
TOTAL ENGINEERS	2,915	2,460	370	40	0	45					
Civil Engineers	1,010	890	110	0	0	10					
Total Ind./Mech. Engineers	1,795	1,525	200	25	0	45					
Mechanical Engineers	265	220	25	10	0	10					
Electrical and Electronics Engineers	500	410	70	10	0	10					
Computer Engineers	505	470	25	10	0	0					
Chemical Engineers	275	235	40	0	0	0					
Industrial and Manufacturing Engineers	135	110	25	0	0	0					
Metallurgical and Materials Engineers	10	0	10	0	0	0					
Mining Engineers	15	15	0	0	0	0					
Petroleum Engineers	60	50	10	0	0	0					
Aerospace Engineers	20	10	0	0	0	10					
Other Professional Engineers	115	45	60	0	10	0					

* Totals may not equal due to "rounding reworking."

Source: Special tabulation performed by Statistics Canada.

Both
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Table 6. Scientists and Engineers, by Educational Attainment and Sex, for Canada: 1991

Occupation	Total	Masters and Earned Doctorate	Bachelors and Equivalent	Other Non-Univ. Certificates	Other Educational Attainment
TOTAL SCIENTISTS & ENGINEERS*	261,595	49,580	113,030	52,770	46,215
TOTAL SCIENTISTS	128,645	30,685	49,140	26,585	22,235
Biologists and Related Scientists	8,160	3,990	3,110	535	520
Mathematicians, Statisticians and Actuaries	6,140	1,240	3,035	665	1,205
Total Physical Science Professionals	21,625	7,930	9,325	1,970	2,400
Physicists and Astronomers	1,905	1,120	420	130	235
Chemists	9,625	3,670	3,870	960	1,130
Geologists, Geochemists and Geophysicists	7,870	2,605	4,285	430	545
Meteorologists	890	205	390	115	175
Other Professional Occupations in Physical Sciences	1,335	330	360	335	315
Total Social Scientists	18,480	11,280	5,060	925	1,215
Psychologists	9,925	7,410	1,935	365	225
Economists and Economic Policy Researchers and Analysts	5,195	2,380	1,940	300	565
Other Professional Occupations in Social Science	3,360	1,490	1,185	260	420
Computer Systems Analysts	74,235	6,240	28,610	22,490	16,895
TOTAL ENGINEERS	132,950	18,895	63,890	26,185	23,980
Civil Engineers	33,365	5,315	16,020	6,205	5,830
Total Ind./Mech. Engineers	95,125	12,870	46,450	18,830	16,975
Mechanical Engineers	23,545	2,640	11,085	5,465	4,345
Electrical and Electronics Engineers	31,655	4,120	15,315	6,510	5,705
Computer Engineers	8,965	1,490	4,940	1,480	1,050
Chemical Engineers	7,680	1,765	4,340	635	935
Industrial and Manufacturing Engineers	10,485	885	4,315	2,635	2,650
Metallurgical and Materials Engineers	1,950	425	895	290	340
Mining Engineers	2,585	340	1,355	310	575
Petroleum Engineers	4,780	570	2,850	625	740
Aerospace Engineers	3,480	630	1,350	870	630
Other Professional Engineers	4,455	705	1,425	1,145	1,180

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Table 6. Scientists and Engineers, by Educational Attainment and Sex, for Canada: 1991--Continued

Occupation	Total	Male			
		Bachelors and Equivalent	Masters and Earned Doctorate	Other Non-Univ. Certificates	Other Educational Attainment
TOTAL SCIENTISTS & ENGINEERS*	212,185	93,785	38,965	42,415	37,020
TOTAL SCIENTISTS	88,000	34,480	21,225	17,545	14,760
Biologists and Related Scientists	5,270	1,770	2,935	275	285
Mathematicians, Statisticians and Actuaries	3,725	1,950	865	360	550
Total Physical Science Professionals	17,520	7,395	6,665	1,540	1,920
Physicists and Astronomers	1,655	390	1,015	105	145
Chemists	6,900	2,625	2,800	610	865
Geologists, Geochemists and Geophysicists	6,930	3,745	2,335	375	470
Meteorologists	790	315	190	110	165
Other Professional Occupations in Physical Sciences	1,240	310	315	335	275
Total Social Scientists	9,380	2,535	5,810	355	680
Psychologists	4,065	645	3,220	95	105
Economists and Economic Policy Researchers and Analysts	3,815	1,410	1,855	180	370
Other Professional Occupations in Social Science	1,500	475	735	85	205
Computer Systems Analysts	52,100	20,830	4,945	15,010	11,315
TOTAL ENGINEERS	124,190	59,305	17,740	24,875	22,265
Civil Engineers	31,460	14,985	5,015	5,900	5,560
Total Ind./Mech. Engineers	88,545	42,985	12,065	17,890	15,605
Mechanical Engineers	22,725	10,650	2,550	5,315	4,210
Electrical and Electronics Engineers	29,560	14,280	3,950	6,260	5,065
Computer Engineers	7,930	4,300	1,365	1,335	925
Chemical Engineers	6,780	3,765	1,550	610	850
Industrial and Manufacturing Engineers	9,530	3,960	775	2,405	2,390
Metallurgical and Materials Engineers	1,820	835	385	275	325
Mining Engineers	2,490	1,300	330	295	560
Petroleum Engineers	4,410	2,600	555	550	700
Aerospace Engineers	3,295	1,290	595	835	570
Other Professional Engineers	4,185	1,335	660	1,085	1,095

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 Table 6. Scientists and Engineers, by Educational Attainment and Sex, for Canada: 1991--Continued Female

Occupation	Total	Masters and Earned Doctorate	Bachelors and Equivalent	Other Univ. Certificates	Other Educational Attainment
TOTAL SCIENTISTS & ENGINEERS*	49,405	10,615	19,245	10,350	9,200
TOTAL SCIENTISTS	40,645	9,460	14,665	9,040	7,480
Biologists and Related Scientists	2,890	1,055	1,335	260	235
Mathematicians, Statisticians and Actuaries	2,415	375	1,080	300	655
Total Physical Science Professionals	4,105	1,260	1,935	430	480
Physicists and Astronomers	245	100	25	25	90
Chemists	2,725	870	1,245	350	265
Geologists, Geochemists and Geophysicists	940	270	535	55	75
Meteorologists	105	10	75	10	10
Other Professional Occupations in Physical Sciences	100	10	50	0	40
Total Social Scientists	9,095	5,470	2,530	570	530
Psychologists	5,860	4,185	1,285	270	115
Economists and Economic Policy Researchers and Analysts	1,375	525	535	125	190
Other Professional Occupations in Social Science	1,860	755	710	175	220
Computer Systems Analysts	22,130	1,295	7,775	7,480	5,580
TOTAL ENGINEERS	8,760	1,155	4,580	1,305	1,720
Civil Engineers	1,910	300	1,030	310	265
Total Ind./Mech. Engineers	6,580	805	3,465	940	1,370
Mechanical Engineers	825	90	440	150	140
Electrical and Electronics Engineers	2,095	170	1,035	250	635
Computer Engineers	1,035	125	635	145	125
Chemical Engineers	895	215	570	25	85
Industrial and Manufacturing Engineers	955	105	360	230	260
Metallurgical and Materials Engineers	130	40	55	15	15
Mining Engineers	95	10	55	15	15
Petroleum Engineers	365	10	245	75	35
Aerospace Engineers	185	35	60	35	55
Other Professional Engineers	270	50	85	55	85

* Totals may not equal due to "random rounding." to provide confidentiality of census data.

Source: Special tabulations performed by Statistics Canada

Table 7. Scientists and Engineers, by Major Fields of Study and Sex, for Canada: 1991

Both
Sexes

Occupation	Total	Educ., Rec. and Counsel. Services	Social Sciences and Rel. Fields	Commerce, Mgt. and Business Admin.	Agricul. and Bio. Sciences	Engineering and Applied Sciences	Engineering and Applied Tech. and Trades	Health, Science, and Technology	Math and Physical Sciences	Others
TOTAL SCIENTISTS & ENGINEERS*	230,495	3,205	23,955	14,445	9,510	83,170	50,970	3,045	42,035	155
TOTAL SCIENTISTS	110,955	2,755	21,380	11,730	8,470	7,260	20,055	2,575	36,615	120
Biologists and Related Scientists	7,755	70	450	65	5,335	230	140	985	470	10
Mathematicians, Statisticians and Actuaries	5,120	115	940	690	135	130	215	85	2,805	0
Total Physical Science Professionals	19,815	75	545	320	2,045	1,805	1,095	640	13,270	20
Physicists and Astronomers	1,745	10	90	20	40	270	90	90	1,130	0
Chemists	8,775	30	140	165	1,700	480	500	525	5,220	15
Geologists, Geochemists and Geophysicists	7,425	25	205	90	145	740	275	10	5,930	0
Meteorologists	780	0	50	15	25	35	65	0	580	10
Other Professional Occupations in Phys. Sci.	1,085	10	55	25	130	275	165	10	405	0
Total Social Scientists	17,495	1,495	13,930	925	140	190	145	415	240	15
Psychologists	9,790	1,230	8,035	60	40	20	20	360	20	0
Economists and Econ. Policy Res. and Anal.	4,720	70	3,315	805	75	150	100	20	185	10
Other Professional Occupations in Soc. Sci.	2,980	200	2,580	60	20	20	30	40	30	0
Computer Systems Analysts	60,775	995	5,510	9,730	815	4,905	18,455	440	19,830	85
TOTAL ENGINEERS	119,540	455	2,575	2,715	1,045	75,910	30,910	475	5,420	40
Civil Engineers	29,590	135	840	490	190	20,565	6,885	65	400	15
Total Ind./Mech. Engineers	86,115	310	1,655	2,130	560	53,540	22,705	300	4,890	25
Mechanical Engineers	21,620	60	260	245	135	13,735	6,795	45	340	10
Electrical and Electronics Engineers	28,825	100	535	560	95	18,400	8,190	95	835	15
Computer Engineers	8,225	65	300	400	60	3,885	1,450	10	2,050	0
Chemical Engineers	7,050	35	90	110	105	5,360	805	55	490	0
Industrial and Manufacturing Engineers	8,985	15	285	595	100	4,690	2,880	90	335	0
Metallurgical and Materials Engineers	1,735	10	35	15	15	1,075	350	0	245	0
Mining Engineers	2,250	0	15	50	15	1,565	470	0	120	0
Petroleum Engineers	4,270	20	80	115	35	3,040	715	0	250	0
Aerospace Engineers	3,155	0	55	50	10	1,770	1,035	10	230	0
(Other Professional Engineers	3,830	10	80	90	290	1,805	1,320	105	130	0

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 Table 7. Scientists and Engineers, by Major Fields of Study and Sex, for Canada: 1991--Continued

Occupation	Total	Educ., Rec. and Counsel. Services	Social Sciences and Rel. Fields	Commer., Mgt. and Business Admin.	Agricul. and Bio. Sciences	Engineering and Applied Sciences	Engineering and Applied Sciences Tech. and Trades	Health, Sciences, and Technology	Math and Physical Sciences	Others
TOTAL SCIENTISTS & ENGINEERS*	188,735	1,495	13,720	9,500	6,440	78,160	44,640	1,505	33,150	120
TOTAL SCIENTISTS	76,565	1,145	11,635	7,425	5,575	6,485	14,630	1,200	28,390	80
Biologists and Related Scientists	5,070	30	260	40	3,555	200	110	520	355	10
Mathematicians, Statisticians and Actuaries	3,265	55	535	380	80	130	135	25	1,915	0
Total Physical Science Professionals	16,070	45	300	245	1,380	1,505	970	420	11,190	10
Physicists and Astronomers	1,555	0	25	15	30	240	90	80	1,060	0
Chemists	6,270	10	65	110	1,070	295	405	320	3,980	0
Geologists, Geochemists and Geophysicists	6,550	15	135	85	135	680	250	10	5,245	0
Meteorologists	690	0	35	10	20	40	65	0	520	0
Other Professional Occupations in Phys. Sci.	1,010	10	35	25	130	250	165	15	380	0
Total Social Scientists	8,815	525	7,125	570	60	145	115	125	145	0
Psychologists	3,985	405	3,400	15	20	15	10	110	10	0
Economists and Econ. Policy Res. and Anal.	3,510	35	2,560	535	30	130	90	0	115	0
Other Professional Occupations in Soc. Sci.	1,320	80	1,165	25	10	10	10	0	20	0
Computer Systems Analysts	43,335	490	3,410	6,185	495	4,495	13,305	105	14,790	60
TOTAL ENGINEERS	112,170	355	2,080	2,075	865	71,675	30,010	305	4,760	40
Civil Engineers	27,900	100	725	415	160	19,430	6,660	35	355	15
Total Ind./Mech. Engineers	80,640	245	1,310	1,595	435	50,515	22,040	180	4,285	25
Mechanical Engineers	20,910	60	225	225	125	13,250	6,675	35	310	10
Electrical and Electronics Engineers	27,265	75	395	395	65	17,490	8,030	55	745	20
Computer Engineers	7,280	45	220	260	50	3,650	1,335	0	1,710	0
Chemical Engineers	6,235	35	85	75	55	4,730	790	25	435	0
Industrial and Manufacturing Engineers	8,235	15	240	465	70	4,350	2,735	60	300	0
Metallurgical and Materials Engineers	1,625	0	25	15	10	1,005	340	0	225	0
Mining Engineers	2,160	0	15	40	20	1,505	465	0	115	0
Petroleum Engineers	3,920	10	45	85	30	2,850	665	0	225	0
Aerospace Engineers	3,010	10	45	30	10	1,685	1,010	0	225	0
Other Professional Engineers	3,625	0	50	65	270	1,730	1,300	90	115	0

Table 7. Scientists and Engineers, by Major Fields of Study and Sex, for Canada: 1991--Continued

Occupation	Total	Female									
		Educat., Rec. and Counsel. Services	Social Sciences and Rel. Fields	Commerce, Mgt. and Business Admin.	Agricul. and Bio. Sciences	Engineering and Applied Sciences	Engineering and Applied Sciences Tech. and Trades	Health, Science, and Technology	Math and Physical Sciences	Others	
TOTAL SCIENTISTS & ENGINEERS*	41,765	1,710	10,235	4,945	3,065	5,010	6,325	1,540	8,880	40	
TOTAL SCIENTISTS	34,395	1,610	9,745	4,305	2,890	775	5,425	1,370	8,220	40	
Biologists and Related Scientists	2,680	45	190	25	1,780	30	35	465	115	0	
Mathematicians, Statisticians and Actuaries	1,850	55	410	305	55	0	85	60	890	0	
Total Physical Science Professionals	3,745	30	240	70	660	295	125	220	2,085	10	
Physicists and Astronomers	195	0	60	0	10	25	0	15	70	0	
Chemists	2,505	20	75	50	630	185	95	200	1,240	0	
Geologists, Geochemists and Geophysicists	880	10	70	10	10	65	20	10	680	0	
Meteorologists	90	0	15	10	10	0	0	0	65	0	
Other Professional Occupations in Phys. Sci.	75	0	20	10	0	25	0	0	25	0	
Total Social Scientists	8,675	970	6,805	350	80	45	35	295	95	10	
Psychologists	5,810	820	4,640	45	20	0	0	250	10	0	
Economists and Econ. Policy Res. and Anal.	1,215	30	750	270	45	20	10	15	70	0	
Other Professional Occupations in Soc. Sci.	1,655	115	1,415	35	10	10	15	30	10	0	
Computer Systems Analysts	17,435	510	2,100	3,545	315	410	5,145	340	5,040	30	
TOTAL ENGINEERS	7,365	100	490	640	175	4,230	900	165	660	0	
Civil Engineers	1,685	35	115	75	30	1,135	225	30	45	0	
Total Ind./Mech. Engineers	5,480	55	350	540	130	3,025	660	120	605	0	
Mechanical Engineers	710	0	30	20	10	485	125	10	30	0	
Electrical and Electronics Engineers	1,560	25	145	165	30	910	160	40	90	0	
Computer Engineers	945	15	75	140	10	235	115	10	345	0	
Chemical Engineers	815	10	0	30	45	625	15	30	60	0	
Industrial and Manufacturing Engineers	750	0	40	125	30	340	145	25	35	0	
Metallurgical and Materials Engineers	110	0	10	0	10	70	10	0	15	0	
Mining Engineers	85	0	0	10	0	60	0	0	10	0	
Petroleum Engineers	350	10	35	25	10	195	45	0	25	0	
Aerospace Engineers	145	0	10	20	0	85	20	0	0	0	
Other Professional Engineers	200	10	25	30	15	75	20	20	10	0	

* Totals may not sum due to "random rounding," to protect confidentiality of census data; a Total reflects population with a post-secondary degree, certificate or diploma.

Source: Special tabulation from 1991 Census, performed by Statistics Canada.

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 Table 8. Employed Labor Force with Post-Secondary Degree, by Detailed Fields of Study and Educational Attainment, for Canada: 1991

Both
 Sexes

Detailed Field of Study	Total	Masters and Earned Doctorate	Bachelors and Equivalent	Other Non-Univ. Certificates	Other Educational Attainment
Total*	3,172,660	187,925	723,985	1,099,585	1,161,170
Total-Natural Science	178,330	32,155	98,865	45,090	2,210
Agricultural Science	34,870	3,715	15,255	13,735	2,160
Biochemistry	11,310	2,760	6,335	2,215	0
Biology	39,215	7,675	27,475	4,060	0
Biophysics	395	220	170	10	0
Botany	2,635	1,320	1,070	190	50
Actuarial Science	3,200	235	2,635	325	0
Chemistry	31,570	8,670	16,025	6,870	0
Geology and Related Fields	18,740	5,375	10,520	2,835	0
General Science	36,395	2,175	19,375	14,845	0
Health Professions, Science and Technology	677,215	25,330	160,660	385,655	105,570
Household Science and Related Fields	101,635	1,455	14,330	25,275	60,580
Metallurgy and Materials Science	2,875	485	555	1,835	0
Physics	16,575	6,390	8,665	1,515	0
Veterinary Medicine/Science	6,670	885	5,365	420	0
Zoology	7,680	2,565	4,650	460	0
Other Agric. & Biological Sciences/Tech.	20,230	65	155	4,585	15,435
Total-Computer Science	162,255	6,670	36,005	89,605	29,970
Data Processing and Computer Science Technologies	113,690	0	0	83,720	29,970
Applied Mathematics & Computer Science	48,565	6,670	36,005	5,890	0
Total-Social Sciences & Related Fields	453,345	66,095	227,915	124,825	34,510
Anthropology & Archeology	9,660	2,495	6,305	860	0
Economics	62,515	10,895	44,715	6,905	0
Geography	30,215	3,980	22,205	3,610	425
Man/Environment Studies	13,725	4,605	6,590	2,525	0
Political Science	39,095	5,980	29,325	3,790	0
Psychology	89,590	18,230	56,900	14,460	0
Sociology	50,450	6,890	34,625	8,930	0
Social Work and Social Services	138,545	12,110	20,815	74,255	31,355
Total Social Sciences & Related Fields	19,550	905	6,430	9,490	2,730

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 Table 8. Employed Labor Force with Post-Secondary Degree, by Detailed Fields of Study and Educational Attainment, for Canada: 1991--Continued

Detailed Field of Study	Total	Both Sexes			
		Masters and Earned Doctorate	Bachelors and Equivalent	Other Non-Univ. Certificates	Other Educational Attainment
Total-Eng. & Applied Sciences	241,220	45,335	164,920	29,295	1,670
Architecture & Architectural Eng.	16,965	2,770	12,785	1,415	0
Aeronautical and Aerospace Engineering	2,270	705	1,180	380	0
Biological & Chemical Eng.	17,265	4,355	12,345	570	0
Civil Engineering	39,440	8,490	27,960	2,980	0
Design/Systems Engineering	795	260	485	50	0
Electrical/Electronic Eng.	45,505	8,675	32,825	4,005	0
Industrial/Manufacturing Engineering	5,510	1,045	3,850	610	0
Mechanical Engineering	39,790	5,985	30,380	3,430	0
Mining, Metallurgical & Petroleum Eng.	9,670	2,295	7,070	305	0
Resources & Environmental Eng.	5,515	1,895	3,110	515	0
Eng. Science/Physics	2,755	725	1,935	95	0
Forestry	17,345	1,345	6,825	9,170	0
Landscape Architecture	5,435	375	1,590	1,805	1,670
Engineering, n.e.c.	32,965	6,410	22,585	3,970	0
Total-Eng. Applied Science Tech and Trades	1,304,635	490	1,895	391,025	911,225
Architectural Technology	20,135	0	0	15,635	4,500
Chemical Technology	11,310	0	0	7,510	3,795
Building Technologies	317,690	95	285	40,355	276,945
Electronic & Electrical Tech.	217,910	10	0	104,370	113,520
Environmental & Conservation Tech.	13,680	0	0	7,880	5,800
General & Civil Eng. Tech.	113,235	0	0	53,470	59,760
Industrial Engineering Tech.	150,335	140	455	30,470	119,270
Mechanical Eng. Tech.	337,335	0	0	81,510	255,825
Prim. Ind./Resource Processing Tech.	30,270	0	0	12,125	18,150
Transportation Technologies	43,190	0	0	14,660	28,530
Engineering/Applied Science Technologies - Other	49,545	240	1,145	23,035	25,125

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 Table 8. Employed Labor Force with Post-Secondary Degree, by Detailed Fields of Study and Educational Attainment, for Canada: 1991--Continued

Detailed Field of Study	Male				
	Total	Masters and Earned Doctorate	Bachelors and Equivalent	Other Non-Univ. Certificates	Other Educational Attainment
Total*	2,154,965	132,720	443,715	587,980	990,545
Total-Natural Science	118,100	24,240	64,090	29,510	250
Agricultural Science	24,535	2,920	11,380	10,005	225
Biochemistry	6,040	1,775	3,490	775	0
Biology	21,720	5,085	14,460	2,175	0
Biophysics	305	170	125	0	0
Botany	1,475	905	470	70	30
Actuarial Science	2,210	205	1,795	210	0
Chemistry	23,085	6,965	11,355	4,765	0
Geology and Related Fields	15,800	4,700	8,990	2,105	0
General Science	22,930	1,515	12,020	9,395	0
Health Professions, Science and Technology	140,080	13,030	71,515	38,495	17,035
Household Science and Related Fields	42,630	325	685	9,725	31,895
Metalurgy and Materials Science	2,745	455	510	1,775	0
Physics	14,605	5,830	7,565	1,205	0
Veterinary Medicine/Science	4,635	665	3,785	185	0
Zoology	5,075	1,940	2,765	370	0
Other Agric. & Biological Sciences/Tech.	17,960	50	110	3,620	14,180
Total-Computer Science	97,560	5,410	26,365	51,670	14,120
Data Processing and Computer Science Technologies	61,925	0	0	47,805	14,120
Applied Mathematics & Computer Science	35,640	5,405	26,370	3,865	0
Total-Social Sciences & Related Fields	227,890	38,705	112,380	55,985	20,820
Anthropology & Archeology	3,825	1,205	2,285	340	0
Economics	47,335	8,765	33,880	4,695	0
Geography	21,330	3,020	15,480	2,500	325
Man/Environment Studies	9,120	3,250	4,175	1,695	0
Political Science	25,470	4,430	18,650	2,390	0
Psychology	30,980	9,025	18,110	3,845	0
Sociology	20,655	3,950	12,205	4,500	0
Social Work and Social Services	60,610	4,610	5,050	32,055	18,895
Other Social Sciences & Related Fields	8,555	450	2,545	3,965	1,595

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 Table 8. Employed Labor Force with Post-Secondary Degree, by Detailed Fields of Study and Educational Attainment, for Canada: 1991--Continued

Male

Detailed Field of Study	Total	Masters and Earned Doctorate	Bachelors and Equivalent	Other Non-Univ. Certificates	Other Educational Attainment
Total-Eng. & Applied Sciences	221,905	41,655	152,300	26,540	1,410
Architecture & Architectural Eng.	13,780	2,295	10,335	1,145	0
Aeronautical and Aerospace Engineering	2,195	685	1,150	365	0
Biological & Chemical Eng.	14,800	3,745	10,610	450	0
Civil Engineering	37,080	7,890	26,370	2,820	0
Design/Systems Engineering	710	230	435	40	0
Electrical/Electronic Eng.	43,085	8,235	31,140	3,705	0
Industrial/Manufacturing Engineering	4,810	875	3,355	585	0
Mechanical Engineering	38,235	5,695	29,250	3,295	0
Mining, Metallurgical & Petroleum Eng.	9,085	2,145	6,685	250	0
Resources & Environmental Eng.	4,595	1,585	2,585	415	0
Eng. Science/Physics	2,550	680	1,770	95	0
Forestry	15,690	1,190	6,175	8,320	0
Landscape Architecture	3,975	240	1,020	1,305	1,410
Engineering, n.e.c.	31,320	6,155	21,415	3,755	0
Total-Eng. Applied Science Tech and Trades	1,261,775	405	1,630	368,905	890,840
Architectural Technology	16,935	0	0	13,070	3,870
Chemical Technology	8,485	0	0	5,415	3,065
Building Technologies	313,815	95	265	39,365	274,090
Electronic & Electrical Tech.	211,710	10	10	100,895	110,795
Environmental & Conservation Tech.	12,250	0	0	6,820	5,425
General & Civil Eng. Tech.	106,100	0	0	49,350	56,745
Industrial Engineering Tech.	146,085	130	395	28,950	116,610
Mechanical Eng. Tech.	332,925	0	0	79,600	253,325
Prim. Ind./Resource Processing Tech.	28,495	0	0	11,115	17,385
Transportation Technologies	39,865	0	0	13,260	26,600
Engineering/Applied Science Technologies - Other	45,100	170	965	21,045	22,925

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 Table 8. Employed Labor Force with Post-Secondary Degree, by Detailed Fields of Study and Educational Attainment, for Canada: 1991--Continued

Detailed Field of Study	Female				
	Total	Masters and Earned Doctorate	Bachelors and Equivalent	Other Non-Univ. Certificates	Other Educational Attainment
Total^a	1,017,700	55,210	280,270	511,605	170,620
Total-Natural Science	60,225	7,915	34,770	15,580	1,960
Agricultural Science	10,335	795	3,870	3,725	1,940
Biochemistry	5,270	985	2,845	1,440	0
Biology	17,495	2,595	13,020	1,885	0
Biophysics	90	50	40	0	0
Botany	1,160	420	595	120	20
Actuarial Science	990	30	840	120	0
Chemistry	8,485	1,705	4,670	2,110	0
Geology and Related Fields	2,940	675	1,530	730	0
General Science	13,460	655	7,355	5,445	0
Health Professions, Science and Technology	537,135	12,295	89,140	347,160	88,530
Household Science and Related Fields	59,005	1,125	13,645	15,550	28,690
Metalurgy and Materials Science	130	30	40	60	0
Physics	1,970	555	1,100	310	0
Veterinary Medicine/Science	2,040	220	1,580	235	0
Zoology	2,605	625	1,885	90	0
Other Agric. & Biological Sciences/Tech.	2,270	10	40	965	1,250
Total-Computer Science	64,690	1,265	9,640	37,930	15,850
Data Processing and Computer Science Technologies	51,765	0	0	35,910	15,855
Applied Mathematics & Computer Science	12,925	1,265	9,635	2,025	0
Total-Social Sciences & Related Fields	225,450	27,390	115,535	68,835	13,690
Anthropology & Archeology	5,830	1,290	4,020	520	0
Economics	15,175	2,130	10,840	2,205	0
Geography	8,880	955	6,720	1,105	100
Man/Environment Studies	4,605	1,360	2,415	825	0
Political Science	13,630	1,555	10,670	1,400	0
Psychology	58,610	9,205	38,790	10,615	0
Sociology	29,795	2,940	22,420	4,430	0
Social Work and Social Services	77,930	7,500	15,770	42,200	12,460
(^b Other Social Sciences & Related Fields)	10,995	455	3,885	5,525	1,130

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Table 8. Employed Labor Force with Post-Secondary Degree, by Detailed Fields of Study and Educational Attainment, for Canada: 1991--Continued

Detailed Field of Study	Total	Female			
		Masters and Earned Doctorate	Bachelors and Equivalent	Other Non-Univ. Certificates	Other Educational Attainment
Total-Eng. & Applied Sciences	19,315	3,680	12,620	2,755	260
Architecture & Architectural Eng.	3,185	475	2,440	265	0
Aeronautical and Aerospace Engineering	70	25	30	15	0
Biological & Chemical Eng.	2,465	610	1,735	120	0
Civil Engineering	2,355	605	1,590	155	0
Design/Systems Engineering	85	30	50	10	0
Electrical/Electronic Eng.	2,420	435	1,685	300	0
Industrial/Manufacturing Engineering	700	175	500	30	0
Mechanical Engineering	1,550	285	1,125	135	0
Mining, Metallurgical & Petroleum Eng.	585	150	380	55	0
Resources & Environmental Eng.	925	310	515	90	0
Eng. Science/Physics	205	35	160	0	0
Forestry	1,655	155	650	855	0
Landscape Architecture	1,465	135	570	495	260
Engineering, n.e.c.	1,645	255	1,175	215	0
Total-Eng. Applied Science Tech and Trades	42,855	80	265	22,120	20,385
Architectural Technology	3,200	0	0	2,565	635
Chemical Technology	2,825	0	0	2,095	730
Building Technologies	3,870	0	20	990	2,855
Electronic & Electrical Tech.	6,195	0	0	3,475	2,725
Environmental & Conservation Tech.	1,430	0	0	1,055	375
General & Civil Eng. Tech.	7,135	0	0	4,115	3,015
Industrial Engineering Tech.	4,250	15	60	1,520	2,660
Mechanical Eng. Tech.	4,405	0	0	1,910	2,495
Prim. Ind./Resource Processing Tech.	1,775	0	0	1,010	765
Transportation Technologies	3,325	0	0	1,400	1,925
Engineering/Applied Science Technologies - Other	4,440	65	185	1,990	2,200

* Totals may not sum due to "random rounding," to protect confidentiality of data. a Totals are based on employed labor force, with post-secondary degree, certificate or diploma.

Source: Special tabulation performed by Statistics Canada.

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