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et, sans nécessairement aboutir à la nécessité d'une refonte complète de nos lois, elle pourrait suggérer des voies de solutions qui tiendraient compte de tous les facteurs en présence. Cela peut sembler une façon un peu laborieuse de régler un problème; il peut tout de même devenir préférable à un moment donné de prendre une telle décision, plutôt que de continuer à croire qu'une simple augmentation dans des prestations ou des pensions résout automatiquement toutes les difficultés. En poursuivant une telle politique, on ne fait que rendre plus solide la structure d'un édifice dont la base est pourtant en grand besoin de réparations.

Engineering and Scientific Manpower Resources in Canada

How much do scientists and engineers earn? Who employs them and in what types of work are they engaged? What is the relationship between their salaries and their education? How many scientists and engineers take post-graduate studies?

These and other questions relating to Canada's professional manpower are answered in a report entitled « Engineering and Scientific Manpower Resources in Canada: Their Earnings, Employment and Education, 1957. »

The bulletin, seventh in a series dealing with professional manpower, was prepared by the Economics and Research Branch, Department of Labour, and analyzes data gathered in 1958 from 10,633 persons in every branch of engineering, architecture, and the following fields of science: agriculture, biology, chemistry, forestry, geology and geophysics, mathematics, physics and veterinary medicine. The report shows that 1957 median salaries for engineers with a Bachelor's degree only, range from $4,600.00 for 1957 graduates to a peak of $10,600.00 for 1920-1924 graduates. The median 1957 salary for scientists with a Bachelor's degree ranged from $4,400.00 for 1957 graduates to $8,500.00 for those who graduated before 1915.

The salaries of both engineers and scientists increased quite rapidly during the first dozen years of experience, then less rapidly, until a plateau was reached after about 20 years of experience. Subsequently, the trend of salaries was erratic with some tendency for declines to occur for those who were still working full time after 35 to 40 years of experience.

Despite this common pattern, there were some interesting differences and similarities in salary levels between those with under-graduate and post-graduate degrees. When engineers and scientists with post-graduate degrees entered the labour market they did not immediately earn as much as their former classmates who had secured em-

ployment as soon as they received under-graduate degrees. On the average, however, the lag was a brief one. Five years after the under-graduate degrees had been obtained, the salaries of both groups were approximately the same. But during the subsequent 15 years of experience, the salaries of engineering bachelor graduates remained on the same general level as those who held master's or doctor's degrees, and beyond this level the trend was somewhat erratic. On the other hand, scientists with post-graduate degrees eventually received markedly higher salaries than those with bachelor's degrees only.

In 1957, industry paid the highest engineering salaries at all levels of experience and training. The salaries of engineers employed by government were next highest, and of those employed by universities, the lowest. Not only did engineers working in industry receive the highest salaries, but the salary differential between them and those in other types of employment increased with experience. For example, in 1957 engineers in industry with single degrees, who graduated between 1948 and 1957, earned $1.300.00 more on average than those employed by universities, while engineers in industry who graduated between 1918 and 1927 received $3,000.00 more in 1957 than their counterparts in universities.

Although the salaries of engineers and scientists in universities were the lowest paid by the three types of employers a much higher proportion of them, 44%, supplemented their regular professional income with other professional income than was the case of salaried engineers and scientists in industry and in government. In industry, 1% of the salaried engineers and scientists supplemented their regular income with other professional income as compared with 6% in the case of the Federal Government and 12% for engineers and scientists employed with the Provincial Governments.

Like those of engineers, the earnings of scientists in industry were by far the highest at all levels of experience and training. There was an even greater tendency for the salary differential of scientists in different types of employment to widen as experience increased. On the Bachelor level, for example, the spread between the earnings of scientists employed in industry and government widened from $1,200.00 for 1948-1957 graduates to $4,700.00 in the case of 1918-1927 graduates.

Engineers doing administrative, management and executive work received the highest median salaries in 1957, ranging from $8,600.00 for 1948-1957 graduates with only one degree, to $15,000.00 for 1918-1927 graduates with a post-graduate degree. The next highest median salaries were received by engineers in consulting and private practice. Teaching, instruction and extension work were most often lowest paid. Lowest salaries were received for testing, inspection and laboratory services. The same pattern was observed among scientists as was found among engineers, although engineers doing administrative work had a broader and higher salary range than did scientists.

The earnings of all engineers were on the average $800.00 above those of all scientists. Median earnings in engineering fields were $7,900.00 in 1957, compared to $7,100.00 for scientists. In only one general field, geo-sciences, did scientists earn on the average as much as engineers in any field.

In the area of the kind of jobs held by professionals, the report showed that the largest single work function performed by engineers was administration and management, closely followed by production and operation, while scientists were concentrated in research and development.

In 1957, by far the largest proportion of scientific and technical personnel, 70%, were employed in industry. The next largest proportion, 14%, were employed by the Federal Government. The remainder were largely with other levels of government and universities. More engineers than scientists were in industry, 82% and 52% respectively. The reverse was true in the Federal Government where 21% of the scientists and 9% of the engineers were employed.

On the relation between employment and education, the data in the report show that 5,157 out of 8,301, or 62% of the under-graduates were employed in 1957 in the province in which they were educated. Many students in scientific and technical courses who received undergraduate degrees from universities in the Maritimes, Manitoba and Saskatchewan tended to obtain employment elsewhere, generally in Ontario. Only 99 out of 340, that is, 29%, of the students in this survey who graduated in New Brunswick were still employed there in 1957. In contrast, 2,429 out of 3,072, or 79%, of the persons in the survey who were educated in Ontario were still employed there in 1957.

Of the 10,633 scientists and engineers reported in this bulletin, 2,462 or 23.2% of them had taken post-graduate study, and of these 1,885 or 17.5% had actually obtained a Master's or Ph.D. degree.

The analysis shows that, in general, scientists have higher academic qualifications than engineers. For example, only 1% of the males in engineering have Doctorates compared to 21% of those in science, excluding agriculture and forestry.

Over 80% of the post-graduate students took courses on the post-graduate level in the same field as, or one that was closely related to, their under-graduate course. Thus, about one in five took a post-graduate course differing from their under-graduate specialization.

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