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AUSTRALIA, 1866-1980*

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The Flow of New, Tertiary Qualified Engineers in Australia,
1866-1980

A central characteristic of era of modern economic growth in world history is the application of a growing knowledge about the physical and biological world to the production of goods and services. In that application professional engineers have played key roles as planners, designers, constructors, and managers. This source paper presents a new count of the flow of tertiary qualified, professional engineers in Australia, 1866-1980.

I. Definitions and Notes

A. Gross Flows

A gross flow is defined as the annual production of all newly graduated, tertiary qualified engineers from a qualified Australian tertiary engineering program.

B. Net Flows

(1) Definition. A net flow is defined as the annual production of newly graduated, tertiary qualified engineers who were available to the Australian labor market. More precisely, a net flow is a gross flow less Columbo Plan foreign students who were obligated to return home after graduation. Columbo Plan engineering students began to graduate from Australian universities in 1951 and Australian technical colleges in 1952.

(2) The School Count. For each university and college which published a list of their graduates in their annual calendar, the number of Columbo Plan graduates is approximated by counting the number of graduates with Asian names. With increasing numbers of Asian-Australians involved in tertiary education in the late 1970s, this approximation becomes less accurate.

(3) The Total Net Flow Count. Unfortunately, not all universities and colleges published graduation name lists. Up to the 1970s the calendars of the U. of Queensland, U. of New South Wales, the U. of Newcastle, the U. of Wollongong, James Cook U. and Deakin U did not publish graduations lists. After 1970 nearly all universities dropped the publication of such lists. With regard to the technical colleges, graduation lists of bachelors, associates and diplomates were unavailable from Queensland Institute of Technology and the Western Australian Institute of Technology but, unlike the universities, the other colleges published good information through 1980. To estimate the total net flow, the annual ratio of net-to-gross graduates is calculated for all of the programs where both net and gross data are available. This annual ratio is multiplied then by the annual gross total for the population. Thus, the annual net-to-gross ratio for six universities is multiplied by the annual gross count for the full 12 universities to get the estimated annual net total flows of university engineering bachelors through 1970. After 1970 the data base is inadequate to support any net university flow

estimate. Annual net-to-gross ratios for 14 technical colleges and the annual gross count for the full 16 colleges are multiplied to estimate the annual net total flows of college bachelors, and college associates and diplomates.

C. Qualified Tertiary Engineers

A qualified tertiary engineer is a person who graduated from a tertiary engineering program whose graduates were approved for membership in the Institution of Engineers, Australia. These programs are set out in B. E. Lloyd and W. J. Wilkin, The Education of Professional Engineers in Australia, 2nd Ed. (Melbourne: APEA, 1962), pp. 351-355 and Brian E. Lloyd, The Education of Professional Engineers in Australia, 3rd Ed. (Melbourne: APEA, 1968), pp. 432-438. The unapproved graduates were 7.65% of new (approved and unapproved) associates and diplomates, 1890-1980, and 2.95% of all (approved and unapproved) engineers receiving a tertiary award, 1866-1980.

D. University Abbreviations

DeU	= Deaken U.	UNSW	= U. of New South Wales
JCU	= James Cook U.	UQu	= U. of Queensland
MoU	= Monash U.	USy	= U. of Sydney
UAd	= U. of Adelaide	UTa	= U. of Tasmania
UMe	= U. of Melbourne	UWA	= U. of Western Australia
UNC	= U. of Newcastle	UWo	= U. of Woolongong

E. College Abbreviations

The term 'technical college' covers all non-university, tertiary education institution, abbreviated as follows:

Bal	= Balarat School of Mines
Ben	= Bendigo School of Mines
Cau	= Caulfield Institute of Technology, later Chisholm I. T.
Chi	= Chisholm Institute of Technology
Foo	= Footscray Technical College
Gor	= Gordon Technical College
Mel	= Melbourne Technical College, later the Royal Melbourne T. C. and the Royal Melbourne I. T.
NSWIT	= New South Wales Institute of Technology
Per	= Perth Technical College
Phi	= Phillips Institute of Technology
Pre	= Preston Diploma School, later Phillips I. T.
Qu	= Queensland Institute of Technology
RMIT	= Royal Melbourne Institute of Technology
SA	= South Australia School of Mines and Industries
Swi	= Swinburne Technical College
Syd	= Sydney Technical College
Tas	= Tasmanian Department of Education
WAIT	= Western Australia Institute of Technology
WASM	= Western Australia School of Mines

F. Time Unit

The figures for the universities up to and including 1960 refer to the calendar year. The university count for 1961 covers the period from January through July 1961. From 1962 to 1967 the university count covers the year ending in July. In 1968 the university count covers the period from August 1967 to June 1968. In 1969 and thereafter the university count covers the year ending in June. The switch in ABS accounting dates had an effect on the continuity of the time series in 1961 only. In the last five months of 1961, 28 gross BEs were graduated. This represented $28/(532+28)$, 5.0%, of gross total BEs graduated in calendar 1961. The effect in 1961 on gross university BTs and BASSs was similar. (In the last five months of 1961, 22 net university BEs graduated. This represented $22/(469/22)$, or 4.5%, of net university BEs graduated in calendar 1961. The effect in 1961 on net university BTs and BASSs was similar.) After 1961, the changes in accounting year were such that they had slight effect because so few graduated in the relevant months. As far as can be gathered from technical college calendars and graduation lists, the calendar year remained the basis for tabulation even after various agencies of the Commonwealth government began to collect data on technical colleges in the late 1960s.

G. Engineering Specialization Abbreviations

Aer = aeronautical	Ind = industrial and production
Agr = agricultural	M&E = mechanical and electrical
Arch = architectural	Mec = mechanical
Aut = automotive	Met = metallurgical
Che = chemical	Min = mining
Civ = civil	M&M = mining and metallurgical
Com = communication	Mun = municipal
C&R = communication and radio	NAr = naval architecture
Ele = electrical	NEC = not classifiable
Elo = electronic	Str = structural
Hig = highway	

H. Error Margins

The data presented here are not comprehensive because they fail to count the small number of IEA-approved graduates from the Central Technical School, Brisbane in the 1950s and 1960s. The resulting undercount probably represents, at most, .5% of those qualifying during these decades. A remaining error results from the inevitable discrepancy between counts based on graduation lists and those based on student card files. Where both types of data were examined, student card counts varied between -1% and +1% around the graduation list counts; adopting this range as the error margin for the aggregates presented here seems appropriate.

II. The Sources

A. Universities

A variety of sources are required to generate data on university bachelor awards. Hence, in the listing of data sources presented here, it is necessary to list separately the sources for gross specialty data, gross engineering bachelor totals, net engineering bachelor totals and gross total bachelors. The beginning and ending dates noted for gross engineering degrees and gross bachelor degrees are the dates of data availability but since the sources for these totals are comprehensive they also represent the life span of the degree up to 1980. The beginning and ending dates noted for the specialty data are the dates of data availability.

Columbo Plan foreign student receiving engineering degrees first appear in 1951 and continue to the final date of this study, 1980. Prior to 1951 gross and net totals are identical. Net data are noted in this source appendix, present or not, for the years, 1951-, only. The sources listed for the net data are annual or cumulative name lists which permit a count of Asian names. In all cases where such data are available, the first Columbo Plan graduates are known. Published name lists in university calendars almost entirely disappear in the early 1970s, so while Columbo Plan students were still receiving degrees at universities, their approximate numbers cannot be discovered with these sources.

The Australian Bureau of Statistics is abbreviated, ABS.

A.1. University of Adelaide

a. Bachelors of Science, Engineering, 1901-1949

Specialty and gross engineering bachelor total data.

University of Adelaide. Calendar. Annual. 1913, 1921, 1930, 1940, 1950. Cumulative name lists.

Up to 1941, the specialization is identified by the accompanying diploma from the South Australian School of Mines and Industries. (These diplomas are not separately enumerated in the SAIT counts.) For the years 1942-1949, the specialty is based on student card files held by the Registrar, University of Adelaide and kindly made available.

b. Bachelors of Engineering, 1913-1980

1. Specialty (1914-1951, 1955-1957, 1959-1960) and gross engineering total data.

1914-1950: University of Adelaide. Calendar. Annual. 1913, 1921, 1930, 1940, 1950. Cumulative name lists.

1951-1975: ABS. University Statistics. Annual. Numerical counts.

- 2. Net engineering total data.
 1955-1975: University of Adelaide. Calendar. 1975.
 Cumulative name list.
 1976-1980: No data available.
- 3. Gross total bachelors data.
 1879-1950: University of Adelaide. Calendar. Annual. 1879-
 -1950. Numerical counts.
 1951-1975: ABS. University Statistics. Annual. Numerical
 counts.
 1976-1980: ABS. Unpub. materials. Numerical counts.

The first BScE degree was given in 1901 and the first BE was awarded in 1913. BScE degrees awarded previously could costlessly convert their BScE degrees into BE degrees upon application. Later BScE degrees involved course work without the final year of the BE; this degree saw substantial usage during WWII. Between 1901 and 1949, the distribution of degrees by first qualification was as follows:

	1901-1912	1913-1941	1942-1950	Total
BSc,E only	19	0	26	45
BSc,E with later BE	32	14	76	123
BE only	0	311	147	458
Total	51	325	249	626

In the tables of this essay, the engineering bachelors of the University of Adelaide are listed by their first qualification.

A.2. Deakin University

Bachelors of Engineering, 1978-1980

- i. Specialty data: none
- ii. Gross total engineering bachelors, 1978-1980
- iii. Gross total bachelors, 1978-1980
 1976-1980: ABS. Unpub. materials. Numerical counts.
- iv. Net total bachelors: none

A.3. James Cook University

Bachelors of Engineering, 1970-1980

- i. Specialty data: none
- ii. Gross total engineering and gross total bachelors
 1970-1975: ABS. University Statistics. Annual. Numerical
 counts.
 1976-1980: ABS. Unpub. materials. Numerical counts.
- iii. Net total engineering bachelors data: none

A.4. University of Melbourne

Bachelors of Engineering, 1866-1980

- i. Specialty data, 1866-1970
- ii. Gross total engineering bachelors, 1866-1980
- iii. Gross total bachelors, 1858-1980
 - 1858-1970: University of Melbourne. Calendar. Annual. 1958-1970. The specialization and gross BE totals for 1866-1957 derive from the summary numerical data provided in the annual reports. For 1958-1970 these items derive from name lists of degrees conferred. The gross total bachelors data, 1858-1970, derive from the numerical data in the annual reports.
 - 1971-1975: ABS. University Statistics. Annual. Numerical counts.
 - 1976-1980: ABS. Unpub. materials. Numerical counts.
- iv. Net total bachelors
 - 1951-1970: University of Melbourne. Calendar. Annual. 1951-1970. Annual name lists.
 - 1971-1980: none

A.5. Monash University

Bachelors of Engineering, 1965-1980

- i. Specialty data, 1967-1972
 - Monash University. Calendar. Annual. 1967-1972. "Reports of Council".
- ii. Gross total engineering bachelors, 1965-1980
- iii. Gross total bachelors, 1965-1980
 - 1965-1975: ABS. University Statistics. Annual. Numerical counts.
 - 1976-1980: ABS. Unpub. materials. Numerical counts.
- iv. Net total engineering bachelors, 1965-1980
 - Monash University. Calendar. Annual. 1965-1980. Annual name lists.

A.6. University of Newcastle

Bachelors of Engineering, 1966-1980

- i. Specialty data: none
- ii. Gross total engineering bachelors, 1966-1980
- iii. Gross total bachelors, 1966-1980
 - 1966-1975: ABS. University Statistics. Annual. Numerical counts.
 - 1976-1980: ABS. Unpub. materials. Numerical counts.
- iv. Net total engineering bachelors: none

B.7. New South Wales University of Technology; University of New South Wales

- a. Bachelors of Engineering, 1952-1980
 - i. Specialty data, 1952-1960
ABS. University Statistics. Annual. Numerical counts.
 - ii. Gross total engineering bachelors, 1952-1980
 - iii. Gross total bachelors, 1952-1980
University of New South Wales. Statistics. Annual. 1981. Numerical counts.
 - iv. Net total engineering bachelors: none

- b. Bachelors of Technology, 1962-1970; Bachelors of Science, Engineering, 1971-1980
 - i. Specialty data: none
 - ii. Gross total engineering bachelors, 1962-1980
1962-1970: ABS. University Statistics. Annual. Numerical counts. Taken from the category, "B.Tech." under the sub-group, "Engineering and Technology".
1971-1980: University of New South Wales. Statistics. Annual. 1981. Numerical counts.
 - iii. Net total engineering bachelors: none

A.8. University of Queensland

- a. Bachelors of Engineering, 1915-1980
 - i. Specialty data, 1949-1960
ABS. University Statistics. Annual. Numerical counts.
 - ii. Gross total engineering bachelors, 1915-1980
 - iii. Gross total bachelors, 1913-1980
University of Queensland. Statistics. Annual. 1959, 1961, 1986. Numerical counts.
 - iv. Net total engineering bachelors: none

- b. Bachelors of Applied Science, 1921-1967
 - i. Specialty data, 1921-1967
 - ii. Gross total engineering bachelors, 1921-1967
University of Queensland. Statistics. Annual. 1959, 1961, 1986. "Industrial Chemistry". Numerical counts.
 - iii. Net total engineering bachelors: none

A.9. University of Sydney

Bachelors of Engineering, 1885-1980; Bachelor of Science, Chemical Engineering

- i. Specialty data, 1885-1973
- ii. Gross total engineering bachelors, 1885-1980

- iii. Net total engineering bachelors, 1955-1973
 - 1885-1954: University of Sydney. Calendar. Annual. 1913, 1954. Cumulative name lists.
 - 1955-1973: University of Sydney. Calendar. Annual. 1955-1973. Cumulative name lists and annual numerical counts.
- iv. Gross total bachelors, 1859-1980
 - 1859-1896: University of Sydney. Calendar. Annual. 1913. Cumulative name list.
 - 1897-1939: University of Sydney. Calendar. Annual. 1898-1940. Annual numerical count.
 - 1940-1948: University of Sydney. Calendar. Annual. 1952. Cumulative name list.
 - 1949-1975: ABS. University Statistics. Annual. Numerical counts.
 - 1976-1980: ABS. Unpub. materials. Numerical counts.

A.10. University of Tasmania

Bachelors of Engineering, 1925-1980

- i. Specialty data: none
- ii. Gross total engineering bachelors, 1925-1980
- iii. Gross total bachelors, 1894-1980
 - 1894-1922: University of Tasmania. Calendar. Annual. 1916/17, 1925. Cumulative name lists.
 - 1923-1948: University of Tasmania. Calendar. Annual. 1926-1949. Annual numerical counts in annual reports.
 - 1949-1975: ABS. University Statistics. Annual. Numerical counts.
 - 1976-1980: ABS. Unpub. materials. Numerical counts.
- iv. Net total engineering bachelors
 - 1957-1971: University of Tasmania. Calendar. Annual. 1957-1971. Annual name lists.
 - 1972-1976: none.
 - 1977-1980: University of Tasmania. Calendar. Annual. 1977-1980. Annual name lists.

A.11. University of Western Australia

a. Bachelors of Engineering, 1925-1980

- i. Specialty data: none
- ii. Gross total engineering bachelors, 1925-1980
- iii. Gross total bachelors, 1917-1980
 - 1917-1948: University of Western Australia. Calendar. Annual. 1948. Cumulative name list.
 - 1949-1975: ABS. University Statistics. Annual. Numerical counts.
 - 1976-1980: ABS. Unpub. materials. Numerical counts.

b. Bachelors of Science, Engineering, 1941-1953

- i. Specialty data: none
- ii. Gross total engineering bachelors, 1941-1953
 - 1941-1948: University of Western Australia. Calendar. Annual. 1948. Cumulative name list.
 - 1949-1953: ABS. University Statistics. Annual. Numerical counts.

A.11. University of Wollongong

Bachelors of Engineering and Science, 1976-1980

- i. Specialty data, 1976-1980
- ii. Gross total engineering bachelors, 1976-1980
 - Private correspondence from the Statistics Officer, University of Wollongong.
- iii. Gross total bachelors, 1976-1980
 - 1976-1980: ABS. Unpub. materials. Numerical counts.
- iv. Net total engineering bachelors: none

B. Technical Colleges, Institutes of Technology, Schools of Mining and Colleges of Advanced Education

Information on technical colleges, institutes of technology, schools of mines and colleges of advanced education is more complete than for the universities. Since the sources are overwhelmingly lists of names who received awards, it is assumed below that the listed source provided gross totals, net totals, and specializations, unless noted otherwise. Furthermore, unless noted otherwise, it is assumed that the information sought (award by school, by specialization, and Australian/foreign student status) is complete over the cited time span.

B.1. The School of Mines, Ballarat

Diplomates, 1908-1976:

Warren Perry, The School of Mines and Industries, Ballarat. A History of its First Hundred and Twelve Years, 1870-1982. Ballarat: School of Mines and Industries Ballarat Ltd, 1984. Pp. 583-597. Cumulative name list.

B.2. Bendigo School of Mines; Bendigo Technical College; Bendigo College of Advanced Education

Diplomates, 1905-1980; Bachelors of Engineers, 1977-1980

Bendigo College of Advanced Education. Registrar. List of Ex-Students Who Gained Awards in Engineering. Unpub. ms., 1986. Cumulative name list.

B.3. Caulfield Institute of Technology; Chisholm Institute of Technology

Diplomates, 1952-1980; Bachelors of Engineering, 1973-1980

1952-1970: Chisholm Institute of Technology. Register of Diplomates up to 1970. Unpub. ms., 1987. Cumulative name list.

1971-1980: Chisholm Institute of Technology. List of Graduates. Annual. 1971-1980. Annual name lists.

There were 45 double diplomates in electrical and mechanical engineering, 1952-1970. Since the purpose of the census is to count persons, the 33 persons who were awarded their double awards in separate years are allocated to their first diploma award year. The remaining 11 persons whose double diplomas came in the same year are arbitrarily assigned years in the following manner: if there was an even number of double award persons in a given year, half are assigned to electrical and half to mechanical; if there was an odd number of double award persons, alternating year to year.

B.4. Footscray Technical College; Footscray Institute of Technology

Diplomates, 1925-1980; Bachelors of Engineering, 1974-1980

1925-1966: Footscray Technical College. Handbook. 1967. Cumulative name list.

1967-1980: Footscray Institute of Technology. Cumulative List of Diploma and Bachelor Degree Holders, 1925-1985. Unpub. ms., 1986. Annual name lists.

Double awards in mechanical and civil in 1941 and mechanical and marine in 1943 are arbitrarily assigned to the mechanical category of their respective years on the basis that the mechanical award was listed first.

B.5. Gordon Technical College; Gordon Institute of Technology

a. Diplomates, 1919-1977

Deakin University. Names of Students Who Received Awards: Gordon Institute of Technology. Unpub. ms., 1986. Cumulative name list.

b. Bachelors of Engineering, 1973-1980

1973-1977: Deakin University. Names of Students Who Received Awards: Gordon Institute of Technology. Unpub. ms., 1986. Cumulative name list.

1978-1980: Private correspondence from R. H. Elliot, Acting Registrar, Deakin University, 21 July 1986. Annual name lists.

B.6. Hobart Technical College

Diplomates, 1925-1979

- 1925-1945: Hobart Technical College. Prospectus. Annual. 1958. "Diplomates of the HTC. Diplomas Awarded Since 1925." Pp. 78-84. Cumulative name list.
- 1946-1956; 1962-1968: Parliament of Tasmania. Education Department. Report of the Year .. Annual. Numerical counts.
- 1957-1961: Brian E. Lloyd. 1968. The Education of Professional Engineers in Australia. 3rd. Ed. (Melbourne: APEA). P. 478. Numerical counts.
- 1969-1980: ABS. 1969-1980. CAE Statistics. Annual. Numerical counts.

From 1946 onward the small number of diplomas awarded by other Tasmanian schools under the Tasmanian Education Department are added to the Hobart T. C. totals. Administration of all these diploma programs passed to the Tasmanian College of Advanced Education in 1972.

B.7. Melbourne Technical College; Royal Melbourne Technical College; Royal Melbourne Institute of Technology

a. Associates, 1903-1977; Fellows, 1936-1977

- 1903-1950: Melbourne Technical College. Prospectus. Annual. 1952. Cumulative award list.
- 1951-1960: Royal Melbourne Technical College. Calendar. Annual. 1961. Cumulative name list.
- 1961-1964. Royal Melbourne Institute of Technology. Calendar. Annual. 1965. Cumulative name list.
- 1965-1977. Royal Melbourne Institute of Technology. Calendar. Annual. 1966-1978. Annual name lists.

b. Bachelors of Engineering, 1972-1980

- 1972-1977: Royal Melbourne Institute of Technology. Calendar. Annual. 1973-1978. Annual name lists.
- 1978-1980: Manuscript data kindly provided by the Tertiary Education Commission, Commonwealth of Australia. Numerical counts.

B.8. New South Wales Institute of Technology

Diplomates, 1971-1979; Bachelors of Engineering, 1972-1980

- 1971-1972: New South Wales Institute of Technology. Calendar. Annual. 1972-1973. Annual name lists.
- 1973-1980: New South Wales Institute of Technology. Conferring of Degrees and Presentation of Diplomas. Annual. 1973-1985. Annual name lists.

The annual counts reported for NSWIT diplomates exclude those who subsequently received a Bachelors of Engineering degree from NSWIT. Annual name lists were checked through 1985 to obtain the appropriate net diplomate counts through 1980.

B.9. Preston Diploma School; Preston Institute of Technology

Diplomates, 1966-1980; Bachelors of Engineering, 1977-1980

Official graduation lists and programs, kindly supplied by M. D. Knight, Academic Registrar, Phillips Institute of Technology. Annual name lists.

These sources give a partial accounting of diplomas awarded by the Preston D.S. and its successor Preston I.T. for the years 1964-1971. It is know that there were 30 diplomates in the first class of 1964, but their specializations are not known. There is no information on the class of 1965 and the lists for 1969-1971 appear undercounted. The 1965-1971 count is therefore partial and incomplete.

B.10. Perth Technical College

Associates, 1946-1967

Perth Technical College. Register of Graduates. Unpub. ms, kindly supplied by P. Bianchi, Registrar, Perth Technical College, 3 July 1986. Cumulative name list.

B.11. Queensland Institute of Technology

Diplomates, 1968-1971; Bachelors of Engineering, 1968-1980; Bachelors of Technology, 1970-1979

Gross Totals Only.

Private correspondence with B. S. Wates, Registrar, Queensland Institute of Technology, Brisbane, 14 July 1986. Numerical counts.

In 1965 QIT began offering two types of award courses, the Fellowship Diploma and the Associate Diploma. The first Fellowship Diplomas were awarded in 1968. In 1973 the Fellowship Diploma was upgraded to a Bachelor of Engineering and Fellowship graduates back to 1968 received a retrospective BE degree; they are so listed in this census. In 1975 the Associate Diploma was upgraded to a Bachelor of Technology; Associate Diplomates from 1970 were awarded a retrospective BT degree and are so listed in this census. The BT course produced its last degree in 1979.

B.12. South Australian School of Mines and Industries; South Australian Institute of Technology

a. Associates, 1890-1969

1890-1962: South Australian Institute of Technology. Graduate List. 1962. Cumulative name list.

1963-1972: South Australian Institute of Technology. Programs. Graduation Ceremony. Annual. 1963-1972. Annual name lists.

In order to exclude associates who later qualified for bachelor degrees from the University of Adelaide or SAIT, the sources just listed were compared with the relevant UAd and SAIT sources. From 1970 to 1972 SAIT awarded Diplomas of Technology. These diplomas were converted wholesale into Bachelors of Technology in 1972. In this census they are enumerated as bachelors.

b. Bachelors of Technology, 1958-1976; Bachelors of Applied Science, Engineering, 1974-1980; Bachelor of Engineering, 1980

1958-1962: South Australian Institute of Technology. Graduates List. Annual. 1962. Cumulative name list.

1963-1980: South Australian Institute of Technology. List of Graduates. Annual. 1963-1980. Annual name list.

From 1958 to 1976 SAIT bachelors engineering candidates received Bachelors of Technology or Bachelors of Applied Science from the University of Adelaide. Starting in 1974, SAIT awarded bachelors degrees of its own.

B.13. Swinburne Technical College; Swinburne College of Technology; Swinburne Institute of Technology

Diplomates, 1921-1980; Bachelors of Engineering, 1974-1980

Gross specializations and totals

1921-1980: Private correspondence with G. L. Williamson, Registrar, Swinburne Institute of Technology, 17 July 1986. Cumulative name lists.

Net specialization and totals.

1921-1950: Private correspondence with G. L. Williamson, Registrar, Swinburne Institute of Technology, 17 July 1986. Cumulative name lists.

1961-1969: Swinburne Technical College. Handbook of the Swinburne Technical College. Annual. 1964-1970. Annual name lists.

1970-1980: Official graduation programs, kindly supplied by G. L. Williamson, Registrar, Swinburne Institute of Technology. Annual name lists.

B.14. Sydney Technical College

Associates, 1894-1966

- 1894-1944: Sydney Technical College. Handbook. Annual. 1946.
 "Fellows and Associates of Sydney Technical College Prior to
 June 1946". Cumulative name list.
- 1945-1966: Sydney Technical College. Handbook. Annual. 1946-
 1967. "Associateships Conferred". Annual name list.

These data include associates who did some or all of their work at the Newcastle, Wollongong, Broken Hill, and Lithgow branches, as well as the main, downtown Sydney branch.

B.15. Western Australian Institute of Technology

Associates, 1968-1980; Bachelors of Engineering, 1970-1980;
 Bachelors of Applied Science, Engineering, 1970-1980

Gross Totals Only

Private correspondence with A. O. de Sousa, Academic Registrar,
 Western Australian Institute of Technology, 26 June 1986 and
 14 July 1986. Numerical counts.

B.16. Western Australian School of Mines

Associates, 1915-1980

- 1907-February, 1980: Western Australian School of Mines. Western
 Australian School of Mines Graduates December 1907 - February
 1980. Unpub. ms., 1980. Kindly supplied by L. Clarris,
 Personal Assistant to the President, Western Australian School
 of Mines. Cumulative name list.
- December 1980: Western Australian School of Mines. Awards.
 Unpub. ms., 1980. Kindly supplied by L. Clarris. Annual name
 list.

Table 1. Total Graduates of Qualified Tertiary Engineering Programs, By Type of Qualification and Educational Institution, Gross and Net, 1866-1950; Gross, 1951-1980

	Uni. Bac. (1)	Uni. B.E. (2)	Uni. BT+ Eng. (3)	Uni. BE+BT +BAS Eng. (4)	Col. B.E. (5)	Col. BT+ Eng. (6)	Col. BE+BT +BAS Eng. (7)	B.E. (8)	BE+ BT+ Eng. (9)	BE+ BT+ Eng. (10)	Col. As& Dip. Eng. (11)	Tot. Qua. Eng. (12)
1858	5											
1859	3											
1860	6											
1861	4											
1862	7											
1863	8											
1864	12											
1865	9											
1866	14	1		1			1		1			1
1867	14	0		0			0		0			0
1868	9	0		0			0		0			0
1869	11	0		0			0		0			0
1870	13	1		1			1		1			1
1871	17	0		0			0		0			0
1872	15	3		3			3		3			3
1873	22	3		3			3		3			3
1874	24	2		2			2		2			2
1875	23	0		0			0		0			0
1876	29	1		1			1		1			1
1877	31	3		3			3		3			3
1878	27	3		3			3		3			3
1879	37	2		2			2		2			2
1880	44	3		3			3		3			3
1881	42	3		3			3		3			3
1882	83	3		3			3		3			3
1883	54	3		3			3		3			3
1884	87	5		5			5		5			5
1885	81	8		8			8		8			8
1886	87	10		10			10		10			10
1887	109	4		4			4		4			4
1888	87	3		3			3		3			3
1889	121	7		7			7		7			7
1890	109	4		4			4		4	1		5
1891	133	9		9			9		9	1		10
1892	153	10		10			10		10	2		12
1893	166	15		15			15		15	0		15
1894	173	15		15			15		15	3		18
1895	207	23		23			23		23	3		26
1896	159	18		18			18		18	8		26
1897	187	24		24			24		24	4		28
1898	197	13		13			13		13	10		23
1899	172	8		8			8		8	9		17

Table 1 (con't). Total Graduates of Qualified Tertiary Engineering Programs, By Type of Qualification and Educational Institution, Gross and Net, 1866-1950; Gross, 1951-1980

	Uni. Bac. (1)	Uni. B.E. (2)	Uni. BT+ BAS Eng. (3)	Uni. BE+BT +BAS Eng. (4)	Col. B.E. (5)	Col. BT+ BAS Eng. (6)	Col. BE+BT +BAS Eng. (7)	B.E. (8)	BT+ BAS Eng. (9)	BE+ BT+ BAS Eng. (10)	Col. As& Dip. Eng. (11)	Tot. Qua. Eng. (12)
1900	159	12		12			12		12	8		20
1901	169	16	1	17			16	1	17	6		23
1902	183	21	3	24			21	3	24	3		27
1903	209	31	1	32			31	1	32	11		43
1904	219	23	6	29			23	6	29	11		40
1905	243	24	5	29			24	5	29	37		66
1906	327	25	3	28			25	3	28	16		44
1907	237	19	4	23			19	4	23	18		41
1908	288	18	5	23			18	5	23	13		36
1909	342	26	6	32			26	6	32	24		56
1910	344	28	4	32			28	4	32	17		49
1911	432	31	6	37			31	6	37	26		63
1912	296	19	7	26			19	7	26	13		39
1913	465	19	2	21			19	2	21	26		47
1914	599	22	0	22			22	0	22	21		43
1915	487	37	4	41			37	4	41	25		66
1916	507	23	0	23			23	0	23	18		41
1917	395	32	0	32			32	0	32	13		45
1918	512	19	0	19			19	0	19	7		26
1919	504	30	0	30			30	0	30	41		71
1920	681	55	0	55			55	0	55	36		91
1921	793	64	1	65			64	1	65	34		99
1922	987	70	1	71			70	1	71	37		108
1923	1057	82	6	88			82	6	88	42		130
1924	1126	118	1	119			118	1	119	45		164
1925	1023	67	0	67			67	0	67	51		118
1926	963	85	0	85			85	0	85	38		123
1927	928	54	1	55			54	1	55	61		116
1928	979	97	1	98			97	1	98	40		138
1929	969	91	2	93			91	2	93	54		147
1930	937	76	2	78			76	2	78	71		149
1931	1019	125	0	125			125	0	125	73		198
1932	1054	114	1	115			114	1	115	100		215
1933	1141	93	2	95			93	2	95	179		274
1934	1110	108	1	109			108	1	109	127		236
1935	1134	113	2	115			113	2	115	114		229
1936	1169	96	5	101			96	5	101	125		226
1937	1182	108	0	108			108	0	108	123		231
1938	1421	104	2	106			104	2	106	124		230
1939	1395	83	1	84			83	1	84	161		245
1940	1334	94	1	95			94	1	95	166		261
1941	1387	94	1	95			94	1	95	155		250

Table 1 (con't). Total Graduates of Qualified Tertiary Engineering Programs, By Type of Qualification and Educational Institution, Gross and Net, 1866-1950; Gross, 1951-1980

	Uni. Bac. (1)	Uni. B.E. (2)	Uni. BT+ BAS Eng. (3)	Uni. BE+BT +BAS Eng. (4)	Col. B.E. (5)	Col. BT+ BAS Eng. (6)	Col. BE+BT +BAS Eng. (7)	B.E. (8)	BT+ BAS Eng. (9)	BE+ BT+ BAS Eng. (10)	Col. As& Dip. Eng. (11)	Tot. Qua. Eng. (12)
1942	1518	140	30	170				140	30	170	173	343
1943	1176	84	39	123				84	39	123	205	328
1944	1317	152	48	200				152	48	200	305	505
1945	1271	59	45	104				59	45	104	204	308
1946	1503	128	13	141				128	13	141	275	416
1947	2094	222	40	262				222	40	262	249	511
1948	2465	246	10	256				246	10	256	300	556
1949	3285	375	21	396				375	21	396	372	768
1950	4111	436	18	454				436	18	454	378	832
1951	4005	476	14	490				476	14	490	433	923
1952	3733	509	9	518				509	9	518	530	1048
1953	3368	428	8	436				428	8	436	462	898
1954	3007	343	2	345				343	2	345	383	728
1955	2947	353	2	355				353	2	355	453	808
1956	3037	387	6	393				387	6	393	515	908
1957	2974	404	7	411				404	7	411	352	763
1958	3305	408	4	412		16	16	408	20	428	487	915
1959	3403	434	9	443		26	26	434	35	469	412	881
1960	4034	454	11	465		37	37	454	48	502	515	1017
1961	3936	532	7	539		40	40	532	47	579	548	1127
1962	5122	627	9	636		41	41	627	50	677	600	1277
1963	5800	665	42	707		37	37	665	79	744	546	1290
1964	6458	683	85	768		57	57	683	142	825	588	1413
1965	7292	713	64	777		65	65	713	129	842	592	1434
1966	8296	762	82	844		42	42	762	124	886	562	1448
1967	9567	820	102	922		68	68	820	170	990	649	1639
1968	10435	842	133	975	13	60	73	855	193	1048	829	1877
1969	12082	993	133	1126	20	77	97	1013	210	1223	833	2056
1970	11898	1064	119	1183	34	92	126	1098	211	1309	802	2111
1971	12847	1092	139	1231	45	114	159	1137	253	1390	839	2229
1972	14107	1059	107	1166	69	103	172	1128	210	1338	721	2059
1973	15157	1211	104	1315	181	154	335	1392	258	1650	785	2435
1974	16845	1396	93	1489	221	123	344	1617	216	1833	806	2639
1975	17100	1551	98	1649	314	172	486	1865	270	2135	757	2892
1976	17868	1482	101	1583	408	209	617	1890	308	2198	704	2904
1977	17954	1381	132	1513	552	167	719	1933	296	2229	470	2702
1978	17843	1316	64	1380	575	204	779	1891	252	2143	330	2489
1979	18835	1421	59	1480	611	152	763	2032	198	2230	322	2565
1980	18024	1314	41	1355	689	146	835	2003	181	2184	256	2446

Table 2. Net Graduates of Qualified Tertiary Engineering Programs,
By Type of Qualification and Educational Institution, 1951-1980

Year	Est.	Est.	Est.	Est.	Est.
	Net	Net	Net		
	Tot.	Tot.	Tot.	Net	Net
	Uni.	Col.	Tot.	Tot.	Tot.
	BE+	BE+	BE+	As. &	Qua.
	BT+	BT+	BT+	Dip.	Eng.
	BAS	BAS	BAS		
	Eng.	Eng.	Eng.		
	(1)	(2)	(3)	(4)	(5)
1951	489		489	433	922
1952	516		516	529	1045
1953	431		431	460	891
1954	338		338	383	721
1955	344		344	451	795
1956	360		360	512	872
1957	378		378	347	725
1958	379	16	395	477	872
1959	403	26	429	388	817
1960	429	37	466	481	947
1961	475	40	515	501	1016
1962	543	40	583	539	1122
1963	643	36	679	475	1154
1964	639	56	695	515	1210
1965	624	63	687	517	1204
1966	752	40	792	475	1267
1967	828	68	896	550	1446
1968	841	72	913	710	1623
1969	996	96	1092	727	1819
1970	955	125	1080	747	1827
1971		157	157	791	
1972		164	164	675	
1973		319	319	760	
1974		323	323	779	
1975		459	459	720	
1976		575	575	664	
1977		683	683	442	
1978		748	748	314	
1979		742	742	311	
1980		787	787	249	

Table 3 (con't). Gross University Bachelors, By University, 1866-1980

Date	UMe (1)	USy (2)	UAd (3)	UTa (4)	UQu (5)	UWA (6)	UNSW (7)	MoU (8)	UNC (9)	JCU (10)	UWo (11)	DeU (12)	Total (13)
1905	87	107	38	11									243
1906	144	142	33	8									327
1907	61	138	33	5									237
1908	101	140	36	11									288
1909	105	193	34	10									342
1910	157	154	27	6									344
1911	199	171	45	17									432
1912	135	121	36	4									296
1913	202	187	62	6	5	3							465
1914	235	267	59	14	22	2							599
1915	157	230	53	14	30	3							487
1916	177	241	23	11	45	10							507
1917	119	172	33	11	40	20							395
1918	185	233	32	10	29	23							512
1919	219	172	40	12	42	19							504
1920	272	263	48	10	43	45							681
1921	284	343	69	16	42	39							793
1922	412	384	70	25	45	51							987
1923	391	466	78	20	42	60							1057
1924	440	494	81	24	47	40							1126
1925	361	461	89	17	47	48							1023
1926	286	462	88	26	50	51							963
1927	338	356	92	30	50	62							928
1928	314	410	84	36	76	59							979
1929	343	409	70	29	73	45							969
1930	308	397	85	36	50	61							937
1931	358	403	88	35	65	70							1019
1932	341	417	107	41	70	78							1054
1933	342	514	99	31	79	76							1141
1934	329	496	113	24	74	74							1110
1935	344	502	106	33	68	81							1134
1936	367	482	94	28	104	94							1169
1937	377	470	129	29	99	78							1182
1938	554	500	129	37	120	81							1421
1939	435	622	116	37	94	91							1395
1940	417	534	114	24	162	83							1334
1941	448	551	131	38	131	88							1387
1942	450	618	155	40	151	104							1518
1943	343	507	110	33	113	70							1176
1944	408	560	128	25	120	76							1317
1945	441	445	165	27	112	81							1271
1946	498	653	60	39	160	93							1503
1947	680	808	241	51	183	131							2094
1948	824	942	233	81	246	139							2465
1949	1191	1187	340	35	296	236							3285
1950	1238	1725	314	118	456	260							4111
1951	1138	1648	401	113	458	247							4005

Table 3 (con't). Gross University Bachelors, By University, 1866-1980

Date	UMe (1)	USy (2)	UAd (3)	UTa (4)	UQu (5)	UWA (6)	UNSW (7)	MoU (8)	UNC (9)	JCU (10)	UWo (11)	DeU (12)	Total (13)
1952	1044	1559	325	96	410	242	57						3733
1953	957	1277	341	89	402	241	61						3368
1954	952	1060	308	70	353	191	73						3007
1955	967	944	287	63	367	214	105						2947
1956	1006	934	328	105	382	162	120						3037
1957	936	876	301	109	391	197	164						2974
1958	974	999	324	118	437	261	192						3305
1959	947	1049	379	121	456	253	198						3403
1960	1183	1136	430	137	573	273	302						4034
1961	745	1273	504	132	574	298	410						3936
1962	1464	1380	556	138	655	374	555						5122
1963	1620	1536	567	182	839	416	640						5800
1964	1614	1760	709	189	936	460	790						6458
1965	1592	2080	779	221	962	540	938	180					7292
1966	1857	2319	906	244	1034	587	903	316	130				8296
1967	1984	2504	1019	267	1240	700	1100	554	199				9567
1968	1993	2557	1030	329	1357	638	1380	887	264				10435
1969	2187	2725	1233	425	1481	786	1706	1268	271				12082
1970	2039	2073	1396	427	1673	832	1636	1490	271	61			11898
1971	2205	2205	1383	474	1827	910	1747	1695	311	90			12847
1972	2074	2662	1359	537	1971	1036	2063	1910	367	128			14107
1973	2223	2772	1389	575	2199	1129	2293	1940	469	168			15157
1974	2486	2852	1440	633	2347	1236	2678	2383	593	197			16845
1975	2325	2760	1541	559	2380	1324	2814	2532	598	267			17100
1976	2263	2883	1593	565	2483	1530	3065	2525	696	265	104		17868
1977	2490	2776	1466	519	2661	1515	3054	2533	663	277	216		17954
1978	2592	2743	1478	571	2542	1529	2909	2525	678	276	289	226	17843
1979	2565	2990	1495	673	2762	1610	2982	2636	812	310	327	207	18835
1980	2579	2994	1361	586	2680	1673	2738	2437	684	292	381	334	18024

Table 4 (con't). Engineers Qualifying with a University Bachelors Degree,
By First Bachelors Qualification, By University,
Gross and Net, 1866-1950; Gross, 1951-1980

Year	UMe (1)	USy (2)	UAd (3)	UQu (4)	UWA (5)	UTa (6)	UNSW (7)	MoU (8)	UNe (9)	JCU (10)	UWo (11)	DeU (12)	Total (13)
1911	14	17	6										37
1912	6	13	7										26
1913	7	12	2										21
1914	6	12	4										22
1915	15	13	9	4									41
1916	9	7	1	6									23
1917	8	12	2	6	4								32
1918	13	3	2	1	0								19
1919	19	5	1	3	2								30
1920	20	17	8	7	3								55
1921	19	30	12	3	1								65
1922	22	31	10	7	1								71
1923	25	32	12	16	3								88
1924	43	48	19	7	2								119
1925	18	24	12	8	3	2							67
1926	31	26	12	10	3	3							85
1927	5	19	12	10	4	5							55
1928	27	32	11	15	9	4							98
1929	35	22	10	13	10	3							93
1930	29	17	13	10	6	3							78
1931	73	22	13	8	6	3							125
1932	40	26	21	12	12	4							115
1933	35	25	13	12	6	4							95
1934	45	32	18	5	5	4							109
1935	30	41	17	10	14	3							115
1936	30	32	12	11	12	4							101
1937	30	31	22	8	13	4							108
1938	43	21	18	12	10	2							106
1939	17	31	14	5	13	4							84
1940	27	30	12	11	13	2							95
1941	27	28	13	7	16	4							95
1942	55	35	30	15	30	5							170
1943	19	53	14	6	25	6							123
1944	48	88	21	17	25	1							200
1945	36	2	22	19	23	2							104
1946	37	69	5	13	9	8							141
1947	74	79	27	41	33	8							262
1948	58	117	33	21	18	9							256
1949	131	149	45	41	20	10							396
1950	58	213	52	74	47	10							454
1951	106	195	73	60	40	16							490
1952	121	177	67	58	54	7	34						518
1953	112	122	65	52	37	11	37						436
1954	84	85	51	47	21	6	51						345

Table 4 (con't). Engineers Qualifying with a University Bachelors Degree,
By First Bachelors Qualification, By University,
Gross and Net, 1866-1950; Gross, 1951-1980

Year	UMe (1)	USy (2)	UAd (3)	UQu (4)	UWA (5)	UTa (6)	UNSW (7)	MoU (8)	UNe (9)	JCU (10)	UWo (11)	DeU (12)	Total (13)
1955	73	76	66	50	25	10	55						355
1956	92	87	55	58	33	9	59						393
1957	84	87	56	68	38	8	70						411
1958	98	94	36	51	47	3	83						412
1959	102	92	58	66	27	8	90						443
1960	97	79	57	82	33	9	108						465
1961	92	99	58	103	30	8	149						539
1962	141	120	63	89	37	10	176						636
1963	139	136	48	104	44	20	216						707
1964	137	161	65	116	30	18	241						768
1965	120	165	67	118	36	21	247	3					777
1966	152	192	57	108	37	13	252	18	15				844
1967	165	179	67	121	36	17	289	36	12				922
1968	130	172	60	137	36	22	342	60	16				975
1969	167	224	75	119	92	28	317	82	22				1126
1970	150	209	97	134	60	23	367	105	31	7			1183
1971	180	161	112	141	73	20	385	127	26	6			1231
1972	187	145	84	132	88	17	333	135	28	17			1166
1973	171	151	97	155	103	36	399	130	55	18			1315
1974	199	182	95	145	95	35	471	193	49	25			1489
1975	212	221	93	168	127	27	538	191	34	38			1649
1976	191	225	113	138	115	39	482	187	49	37	7		1583
1977	169	180	103	192	97	22	487	163	56	31	13		1513
1978	177	172	70	132	108	29	343	177	59	35	49	29	1380
1979	160	191	115	159	104	24	393	152	76	37	46	23	1480
1980	185	173	95	161	98	27	310	153	51	33	53	16	1355

Table 5. Estimated Net Engineers Qualifying with a University Bachelors Degree, By First Bachelors Qualification, 1951-1970

Date	UMe (1)	USy (2)	UAd (3)	UWA (4)	UTa (5)	MoU (6)	Sum Col.(1) -(6) (7)	Ratio Net to Gross Col.(1) -(6) (8)	Est. Net Total Un. Deg. Eng. (9)
1951	105	195	73	40	16		429	0.998	489
1952	120	176	67	54	7		424	0.995	516
1953	112	120	65	35	11		343	0.988	431
1954	81	85	51	19	6		242	0.980	338
1955	71	73	65	25	8		242	0.968	344
1956	87	73	54	30	9		253	0.917	360
1957	79	81	51	33	7		251	0.919	378
1958	90	93	27	43	3		256	0.921	379
1959	91	88	50	26	6		261	0.909	403
1960	90	70	53	32	9		254	0.924	429
1961	86	86	47	28	6		253	0.882	475
1962	125	98	51	33	10		317	0.854	543
1963	124	132	38	43	15		352	0.910	643
1964	128	126	56	28	4		342	0.832	639
1965	108	122	53	31	14	3	331	0.803	624
1966	140	163	48	34	15	18	418	0.891	752
1967	153	156	61	32	13	34	449	0.898	828
1968	112	157	52	32	13	48	414	0.863	841
1969	145	211	62	81	18	74	591	0.885	996
1970	139	197	78	48	18	95	575	0.893	955

Table 6. Associates and Diplomates of Engineering, By College,
Gross and Net, 1890-1951; Gross, 1952-1980

Year	SA	Syd	Bal	Mel	Ben	WASM	Gor	Swi	Foo	Tas	Per	Cau	Pre	Qu	WAIT	NSW	Tot
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1890	1																1
1891	1																1
1892	2																2
1893	0																0
1894	3	0															3
1895	2	1															3
1896	7	1															8
1897	4	0															4
1898	10	0															10
1899	6	0	3														9
1900	6	0	2														8
1901	6	0	0														6
1902	2	1	0														3
1903	3	1	5	2													11
1904	4	2	4	1													11
1905	3	24	3	6	1												37
1906	4	5	1	5	1												16
1907	2	7	5	4	0												18
1908	2	7	4	0	0												13
1909	5	9	0	10	0												24
1910	3	5	1	4	4												17
1911	1	8	6	7	4												26
1912	2	3	2	4	2												13
1913	7	2	5	10	2												26
1914	2	1	6	7	5												21
1915	2	3	2	12	4	2											25
1916	4	2	0	10	2	0											18
1917	0	1	2	7	2	1											13
1918	2	1	1	1	0	2											7
1919	2	2	6	20	8	0	3										41
1920	7	2	6	13	2	1	5										36
1921	4	2	8	13	3	0	1	3									34
1922	3	8	3	11	3	2	3	4									37
1923	2	7	6	12	2	1	6	6									42
1924	1	16	2	15	4	1	1	5									45
1925	4	13	3	12	3	0	1	11	3	1							51
1926	3	15	3	10	1	2	0	2	1	1							38
1927	4	29	2	9	5	4	0	4	4	0							61
1928	1	16	0	8	1	3	0	8	1	2							40
1929	5	19	0	11	4	2	0	12	1	0							54
1930	2	39	3	10	0	6	2	4	5	0							71
1931	0	44	2	10	4	1	2	3	6	1							73
1932	6	65	2	13	1	0	0	1	12	0							100
1933	2	150	7	10	1	0	2	3	4	0							179
1934	5	75	4	22	1	1	3	4	12	0							127
1935	1	60	3	22	4	1	3	15	5	0							114

Table 6 (con't). Associates and Diplomates of Engineering, By College,
Gross and Net, 1890-1951; Gross, 1952-1980

Year	SA	Syd	Bal	Mel	Ben	WASM	Gor	Swi	Foo	Tas	Per	Cau	Pre	Qu	WAIT	NSW	Tot
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1936	4	78	5	14	2	1	2	13	6	0							125
1937	2	73	4	17	2	2	3	13	3	4							123
1938	4	90	4	6	3	0	4	11	2	0							124
1939	2	122	4	11	8	2	3	7	2	0							161
1940	3	122	7	11	4	2	4	9	4	0							166
1941	3	112	3	7	1	2	3	7	12	5							155
1942	2	118	1	10	4	6	6	10	15	1							173
1943	3	141	1	23	3	6	3	9	13	3							205
1944	2	155	2	96	7	2	7	7	13	14							305
1945	2	144	2	18	4	3	2	7	13	9							204
1946	1	122	1	96	1	4	5	19	15	10	1						275
1947	2	173	11	8	1	6	16	11	4	17	0						249
1948	5	177	8	8	5	5	12	34	34	6	6						300
1949	5	221	3	5	5	13	16	47	47	6	4						372
1950	12	234	4	3	4	10	14	27	36	16	18						378
1951	4	198	4	71	6	6	16	63	40	14	11						433
1952	10	239	9	86	8	11	13	92	38	9	12	3					530
1953	16	220	6	95	0	6	15	52	26	14	4	8					462
1954	12	191	8	67	4	11	7	44	14	10	6	9					383
1955	8	201	10	85	3	4	11	35	41	24	7	24					453
1956	13	247	5	91	7	14	10	48	28	18	8	26					515
1957	12	123	6	77	3	7	14	36	28	12	12	22					352
1958	10	145	5	117	3	9	17	63	27	42	17	32					487
1959	6	120	10	118	13	10	24	30	26	22	11	22					412
1960	9	162	8	164	14	8	20	31	40	22	27	10					515
1961	4	150	36	169	15	12	30	33	28	10	15	46					548
1962	3	127	23	210	11	8	36	56	40	15	24	47					600
1963	1	88	13	190	8	6	30	57	48	19	21	65					546
1964	3	80	26	205	13	16	32	66	36	22	26	63					588
1965	4	38	18	212	14	12	32	82	46	28	37	69					592
1966	0	5	12	224	22	8	46	69	59	31	51	30	5				562
1967	8		24	246	20	8	48	78	61	17	50	82	7				649
1968	2		32	307	31	3	47	111	70	22		93	21	48	42		829
1969	9		26	286	40	14	43	111	63	21		97	12	59	52		833
1970			37	256	22	13	52	99	75	30		62	9	57	90		802
1971			33	239	44	7	39	146	55	32		115	2	15	87	25	839
1972			33	193	34	9	47	69	52	9		114	49		78	34	721
1973			26	151	37	3	41	99	63	24		129	45		107	60	785
1974			44	134	43	9	47	113	54	4		127	52		130	49	806
1975			31	145	40	9	20	140	58	17		111	43		96	47	757
1976			44	156	28	8	21	110	63	31		91	29		83	40	704
1977				45	34	7	30	91	47	17		92	18		66	23	470
1978				0	23	5		75	31	16		99	22		33	26	330
1979				0	18	8		73	38	14		92	28		22	29	322
1980				0	29	1		66	32			88	25		15		256

Table 7. Estimated Net Associates and Diplomates of Engineering,
By College, 1952-1980

Year	SA 1	Syd 2	Bal 3	Mel 4	Ben 5	WASM 6	Gor 7	Swi 8	Foo 9	Tas 10	Per 11	Cau 12	Pre 13	NSW 14	Total Col.1 -11 15	Est Net Total 16
1952	10	239	9	85	8	11	13	92	38	9	12	3			529	529
1953	16	220	6	93	0	6	15	52	26	14	4	8			460	460
1954	12	191	8	67	4	11	7	44	14	10	6	9			383	383
1955	8	201	10	84	3	4	11	34	41	24	7	24			451	451
1956	13	247	5	88	7	14	10	48	28	18	8	26			512	512
1957	12	123	6	72	3	7	14	36	28	12	12	22			347	347
1958	10	145	5	109	2	9	17	63	27	42	16	32			477	477
1959	6	120	10	95	13	10	24	30	26	22	10	22			388	388
1960	9	162	7	138	14	8	16	31	40	22	24	10			481	481
1961	4	150	36	126	15	12	28	32	27	10	15	46			501	501
1962	3	127	22	163	11	8	34	53	36	15	21	46			539	539
1963	1	88	10	132	8	6	28	53	47	19	19	64			475	475
1964	3	80	23	149	12	16	30	60	35	22	23	62			515	515
1965	4	38	14	167	12	12	30	74	44	28	28	66			517	517
1966	0	5	7	176	16	8	41	63	57	31	38	28	5		475	475
1967	8		17	196	7	8	48	74	52	17	38	78	7		550	550
1968	2		24	238	22	3	46	106	59	22		90	21		633	710
1969	9		15	233	35	14	41	103	59	21		88	12		630	727
1970			31	238	18	13	50	91	70	30		60	9		610	747
1971			26	218	40	7	39	142	53	32		111	2	25	695	791
1972			29	175	32	9	47	66	46	9		109	46	34	602	675
1973			24	136	37	3	41	97	62	24		129	45	58	656	760
1974			39	122	43	9	47	112	53	4		124	51	49	653	779
1975			29	128	39	9	20	135	55	17		107	43	47	629	720
1976			40	142	28	8	21	101	60	31		86	29	40	586	664
1977				41	33	7	27	86	42	17		86	18	23	380	442
1978					23	5		73	29	16		90	22	25	283	314
1979					17	8		71	34	14		89	28	29	290	311
1980					29	1		66	29			85	24		234	249

Table 8. Gross Engineers Qualifying with a College
Bachelors Degree, 1958-1980

Year	SA (1)	Qu (2)	WAIT (3)	NSWIT (4)	RMIT (5)	Chi. (6)	Gor. (7)	Swi. (8)	Foo. (9)	Ben. (10)	Phi. (11)	WASM (12)	Gross Total B.E.& B.T. (13)
1958	16												16
1959	26												26
1960	37												37
1961	40												40
1962	41												41
1963	37												37
1964	57												57
1965	65												65
1966	42												42
1967	68												68
1968	60	13											73
1969	77	20											97
1970	84	40	2										126
1971	97	62	0										159
1972	73	69	13	4	13								172
1973	122	80	5	36	51	13	5	23					335
1974	82	92	4	23	55	12	7	55	14				344
1975	96	94	38	57	90	24	6	67	14				486
1976	110	97	65	70	101	51	22	90	11				617
1977	83	95	72	155	97	45	27	94	33	8	10		719
1978	105	131	72	150	117	56	14	78	34	9	13		779
1979	55	91	140	164	107	58	13	79	32	11	12	1	763
1980	61	76	182	181	107	41	3	101	41	12	21	9	835

Table 9. Estimated Net Engineers Qualifying with
a College Bachelors Degree

Year	SA (1)	RMIT (2)	NSW (3)	Chi. (4)	Gor. (5)	Swi. (6)	Foo. (7)	Ben. (8)	Phi. (9)	WASM (10)	Ratio Net-		Est. Net Total T.C. etc. Eng. (13)
											Sum Cols. (10) to (11)	Gross Cols. (10) to (12)	
1958	16										16	1.00	16
1959	26										26	1.00	26
1960	37										37	1.00	37
1961	40										40	1.00	40
1962	40										40	0.98	40
1963	36										36	0.97	36
1964	56										56	0.98	56
1965	63										63	0.97	63
1966	40										40	0.95	40
1967	68										68	1.00	68
1968	59										59	0.98	72
1969	76										76	0.99	96
1970	83										83	0.99	125
1971	96										96	0.99	157
1972	72	10	4								86	0.96	164
1973	115	45	36	13	5	23					237	0.95	319
1974	78	52	22	11	7	49	14				233	0.94	323
1975	91	84	56	24	6	60	13				334	0.94	459
1976	110	83	70	48	22	80	11				424	0.93	575
1977	80	87	153	39	27	89	31	8	10		524	0.95	683
1978	102	102	150	53	14	77	33	9	13		553	0.96	748
1979	52	107	160	53	13	79	29	11	12	1	517	0.97	742
1980	58	94	173	38	3	99	40	11	19	9	544	0.94	787

Table 10. Gross Engineers Qualifying with a University
Bachelors Degree, By First Bachelors Qualification,
By Specialization, Gross and Net, 1866-1950; Gross, 1951-1980

Date	Che 1	Civ 2	Ele 3	M&E 4	Mec 5	M&M 6	Min 7	Met 8	Agr 9	Ind 10	Aer 11	Arc 12	SUM		Gross Total Un. Deg. Eng. 15
													Co.1- 13	NEC 14	
1866		1											1	0	1
1867		0											0	0	0
1868		0											0	0	0
1869		0											0	0	0
1870		1											1	0	1
1871		0											0	0	0
1872		3											3	0	3
1873		3											3	0	3
1874		2											2	0	2
1875		0											0	0	0
1876		1											1	0	1
1877		3											3	0	3
1878		3											3	0	3
1879		2											2	0	2
1880		3											3	0	3
1881		3											3	0	3
1882		3											3	0	3
1883		3											3	0	3
1884		5											5	0	5
1885		7					1						8	0	8
1886		10					0						10	0	10
1887		4					0						4	0	4
1888		3					0						3	0	3
1889		7					0						7	0	7
1890		4					0						4	0	4
1891		9					0						9	0	9
1892		10					0						10	0	10
1893		15					0						15	0	15
1894		13				2	0						15	0	15
1895		20				3	0						23	0	23
1896		17				1	0						18	0	18
1897		23				1	0						24	0	24
1898		10				3	0						13	0	13
1899		7				1	0						8	0	8
1900		5				7	0						12	0	12
1901		8				9	0						17	0	17
1902		8				16	0						24	0	24
1903		7		1		23	1						32	0	32
1904		7		1		19	2						29	0	29
1905		8		2		18	1						29	0	29
1906		10	1	2		10	5						28	0	28
1907		7	1	6	1	4	4						23	0	23

Table 10 (con't). Gross Engineers Qualifying with a University Bachelors Degree, By First Bachelors Qualification, By Specialization, Gross and Net, 1866-1950; Gross, 1951-1980

Date	Che 1	Civ 2	Ele 3	M&E 4	Mec 5	M&M 6	Min 7	Met 8	Agr 9	Ind 10	Aer 11	Arc 12	SUM		Gross Total Un. Deg. Eng. 15
													Co.1- 13	Co.12 14	
1908		6	4	8	1	2	2						23	0	23
1909		5	4	9	0	9	4	1					32	0	32
1910		5	3	9	0	8	7	0					32	0	32
1911		12	4	11	2	4	4	0					37	0	37
1912		7	3	7	0	6	2	1					26	0	26
1913		6	1	4	0	5	5	0					21	0	21
1914		7	1	9	2	0	1	2					22	0	22
1915		15	9	6	1	1	5	0					37	4	41
1916		7	2	1	1	2	4	0					17	6	23
1917		11	4	4	0	0	3	0					22	10	32
1918		10	1	0	2	0	5	0					18	1	19
1919		13	4	3	2	0	3	0					25	5	30
1920		22	3	9	4	2	5	0					45	10	55
1921	1	31	6	11	10	2	1	0					62	3	65
1922	0	24	9	16	9	1	4	0					63	8	71
1923	4	33	12	15	6	1	2	0					73	15	88
1924	1	52	17	27	7	2	3	1					110	9	119
1925	0	20	4	16	2	1	9	2					54	13	67
1926	0	29	12	14	7	2	2	3					69	16	85
1927	1	12	5	13	5	0	0	1					37	18	55
1928	1	24	15	21	9	1	0	0					71	27	98
1929	4	30	15	13	5	0	1	1					69	24	93
1930	4	28	14	8	4	0	0	2				1	61	17	78
1931	1	67	5	4	6	0	16	8				1	108	17	125
1932	2	43	7	10	6	1	13	4				2	88	27	115
1933	4	35	5	12	5	1	6	4				3	75	20	95
1934	5	38	9	12	8	2	19	1				1	95	14	109
1935	5	37	9	18	7	3	5	5				1	90	25	115
1936	8	32	5	12	6	1	13	1				1	79	22	101
1937	5	22	7	13	12	2	12	9				1	83	25	108
1938	5	25	12	6	4	1	16	15				0	84	22	106
1939	5	13	6	16	12	3	2	5				1	63	21	84
1940	8	21	8	12	12	3	3	3				0	70	25	95
1941	4	16	9	14	13	2	4	5			1	0	68	27	95
1942	41	23	6	14	20	2	1	10			7	0	124	46	170
1943	16	20	5	25	4	2	3	4			7	1	87	36	123
1944	37	35	8	31	13	0	1	14			20	0	159	41	200
1945	15	13	10	1	15	1	2	8			0	0	65	39	104
1946	25	27	5	22	12	1	1	8			12	1	114	27	141
1947	24	64	14	35	30	1	3	9			10	0	190	72	262
1948	30	67	12	48	22	3	8	8			9	2	209	47	256
1949	41	129	46	59	41	10	10	21			10	1	368	28	396

Table 10 (con't). Gross Engineers Qualifying with a University
Bachelors Degree, By First Bachelors Qualification,
By Specialization, Gross and Net, 1866-1950; Gross, 1951-1980

Date	Che 1	Civ 2	Ele 3	M&E 4	Mec 5	M&M 6	Min 7	Met 8	Agr 9	Ind 10	Aer 11	Arc 12	SUM		Gross Total Un. Deg. Eng. 15
													Co.1- 13	NEC 14	
1950	35	140	54	75	40	14	4	12			25	1	400	54	454
1951	24	146	48	80	56		25	17			25	4	425	65	490
1952	30	140	52	83	57		15	5			8		390	128	518
1953	23	106	32	64	63		21	6			8		323	113	436
1954	16	98	44	34	44		18	7			6		267	78	345
1955	13	131	56	32	50		19	10			5	4	320	35	355
1956	13	132	70	37	60		16	12			5	6	351	42	393
1957	20	119	91	33	63		16	15			8		365	46	411
1958	27	109	89		62		17	8	3		10		325	87	412
1959	48	115	115		87		21	11	2		8	1	408	35	443
1960	39	118	124		89		25	15	2		9	2	423	42	465
1961	43	50	59		30		1	3	1	2	9		198	341	539
1962	31	80	95		42		3	4	3	3	7		268	368	636
1963	41	98	89		39		2	9	2	2	3		285	422	707
1964	52	90	89		63		1	4	3	3	5		310	458	768
1965	52	87	86		42		4	5	0	9	10		295	482	777
1966	42	109	117		66		3	3	4	2	9		355	489	844
1967	59	131	120		52		0	3	6	4	6		381	541	922
1968	54	134	106		56		1	3	0	4	4		362	613	975
1969	67	159	125		77		12	5	8	8	16		477	649	1126
1970	74	178	111		68		10	4	3	5	10		463	720	1183
1971	38	113	78		46		5	0			13		293	938	1231
1972	37	111	72		45		4	0			19		288	878	1166
1973	12	53	48		20		8	0			10		151	1164	1315
1974														1489	1489
1975														1649	1649
1976														1583	1583
1977														1513	1513
1978														1380	1380
1979														1480	1480
1980														1355	1355

Table 12. Gross Engineers Qualifying with a College Bachelors Degree, By Specialization, 1958-1980

Year	Che. (1)	Civ. (2)	Str. (3)	Ele. (4)	Com. (5)	Elo. (6)	M&E (7)	Mec. (8)	Aer. (9)	M&M (10)	Total (11)
1958		8		2	0	0		6		0	16
1959		14		6	0	2		4		0	26
1960		12		6	0	7		12		0	37
1961		6		7	0	19		8		0	40
1962		4		18	0	11		8		0	41
1963		10		8	0	15		4		0	37
1964		17		9	0	12		19		0	57
1965		24		11	0	16		14		0	65
1966		10		6	0	18		8		0	42
1967		29		8	0	16		15		0	68
1968		29		13	0	16		15		0	73
1969		42		16	0	21		18		0	97
1970		49		19	1	24		33		0	126
1971		53		29	0	32		41		4	159
1972	8	56		30	2	35		41		0	172
1973	9	98	1	64	23	39		94		7	335
1974	9	114	0	65	26	22		103		5	344
1975	20	146	1	100	46	46		116	8	3	486
1976	13	201	3	149	54	55		128	8	6	617
1977	12	223	4	194	49	46	10	168	10	3	719
1978	14	260	4	196	37	35	13	202	13	5	779
1979	10	245	7	190	46	52	12	187	12	2	763
1980	10	249	7	203	18	58	21	199	11	59	835