

REFERENCES AND NOTES

ABBREVIATIONS

Trans. LES: Transactions of the Liverpool Engineering Society

Jnl. LES: Journal of the Liverpool Engineering Society

Jnl. IEE: Journal of the Institution of Electrical Engineers

J. IEE: Journal of the Institution of Electrical Engineers (New Series)

Proc. IEE: Proceedings of the Institution of Electrical Engineers

DNB: Dictionary of National Biography

CHAPTER 1

- 1 DODD, A. H.: 'The industrial revolution in North Wales'. (University of Wales Press, 1971, 3rd edn.)
- 2 *Trans. LES*, 4th March 1915
- 3 ROLT, L. T. C.: 'The story of the second Mersey tunnel and approach roads'. Mersey Tunnel Joint Committee, 1971
- 4 *Trans. LES*, **XXXVII**, 42nd Session, 1916, pp. 56-73
- 5 *Op. cit.*, 1899, **XX**, 25th Session, p. 10
- 6 'The Liverpool Overhead Railway—A pioneer in rapid transport', *Trans. LES*, 1952, **LXXIII**, 78th Session, pp. 89-112
- 7 Addresses included those given by John A. Brodie in 1895, J. Reginald Taylor in 1899, and Ernest S. Wilcox in 1902, published in the *Transactions*. For later developments a paper entitled 'Tramways' by Thomas Molyneux, M.B.E., M.I.Mech.E., published in Vol. XLV of the *Transactions*, may be consulted
- 8 There is a selection of unpublished material; the primary source is the collection of published annual reports of the general manager, Liverpool Corporation Tramways & Omnibuses
- 9 In the book 'The golden age of tramways' by Charles Klapper (Routledge & Kegan Paul, 1961), the author states that the first tramway was opened in Liverpool in 1859. This was a passenger service utilising the rail system employed for goods traffic owned by the Mersey Docks & Harbour Board, running largely on dock roads, using horse-drawn trams. The service caused inconvenience to dock freight traffic, and the scheme was withdrawn after nine months. The Birkenhead project was planned and undertaken on public roads. The dock tramway is also referred to in 'Tramway companies in Liverpool, 1859-97' by S. Alasdair Munro, published in the *Trans. Hist. Soc. of Lancashire and Cheshire*, **119**, 1967, p. 181
- 10 *Trans. LES*, 1909-10, **XXXI**, pp. 441-442
- 11 *Liverpool Official Handbook*
- 12 BROOKS, COLIN: 'Graysons of Liverpool': a history of Grayson, Rollo and Clover Docks Ltd. (Henry Young, Liverpool, 1956)
- 13 'Mersey Shipbuilding and Ship-repairing', *Manchester Guardian, Liverpool: Commercial Supplement*, 14th July 1927, p. 17

- 13 FLETCHER, GARDNER C.: 'The growth of marine engineering at Birkenhead during the last 100 years and possible developments in the immediate future', *Jnl. LES* 1960-61, **VI**, pp. 127-65
- 14 *Ibid.*, pp. 67-92
- 15 SWALE, W. E.: 'Forerunners of the North-Western Electricity Board', (The North-Western Electricity Board, Manchester) provides a useful summary
- 16 *Ibid.*
- 17 'City & County of the City of Chester Electricity Undertaking: Jubilee Commemoration 1896-1946', on which these notes are based
- 18 *Ibid.*, p. 30

CHAPTER 2

- 1 STEPHENS, M. D., and RODERICK, G. W.: 'Education and training for English engineers in the late 19th century and early 20th century', *Annals of Science*, June 1971, **27**, (2), includes details of both the Liverpool Polytechnic Society and the Liverpool Engineering Society
- 2 'The Liverpool Philomathic Society', *Illustrated Liverpool News*, August 1966 p. 21, provides a brief historical account of the society
- 3 LEE SYDNEY, (Ed.): *DNB*, 1897, **XLIX**, 'Celebrities of the century', 1890, **4**, pp. 870-871. 'William Roscoe of Liverpool' by G. Chandler, 1953, may also be consulted
- 4 LEE: **LVII**, 1899
- 5 ORMEROD, H. A.: 'The Liverpool Royal Institution: a record and a retrospect', Liverpool University Press, 1953, is a standard work, on which the author has drawn for the background given of the Royal Institution
- 6 KELLY, T.: 'Adult education in Liverpool', 1960, p. 14. This booklet provides useful guidelines regarding local institutions and their background
- 7 ORMEROD, p. 11
- 8 *Ibid.*
- 9 ROSCOE, W.: 'Discourse delivered on the opening of the Liverpool Royal Institution', 25th November 1817, p. 75. The list of Committee Members is taken from this document
- 10 ORMEROD, p. 27
- 11 'Report of the origin, progress and present state of the Liverpool Apprentices' and Mechanics' Library', by its originator Egerton Smith, *The Kaleidoscope* 1823-24, **4**, p. 255
- 12 *Ibid.*
- 13 *The Kaleidoscope*, 1825-26, **6**, p. 285
- 14 *The Liverpool Mercury*, 2nd February 1838, published a letter from a member of the Institute, dated 20th January 1838
- 15 STEPHEN, LESLIE (Ed.): *DNB*, 1886, **6**
- 16 *The Liverpool Mercury*, *op. cit.*
- 17 *The Kaleidoscope*, 1824-25, **5**, pp. 430-431
- 18 TIFFEN, H. J.: 'A history of the Liverpool Institute Schools, 1825-1935' (Liverpool Institute Old Boys' Association, 1935). This publication provides the background to the setting up and activities of the Liverpool Mechanics' Institution
- 19 TYLECOTE, M.: 'The Mechanics' Institutes of Lancashire and Yorkshire before 1851', (Manchester University Press, 1957), p. 9
- 20 TIFFEN, *op. cit.*
- 21 STEWART, D.P.: 'The Woolton Mechanics' Institute', *Trans. Unitarian Hist. Soc.*, 1952, **10**. This paper provides a detailed account of the history of the institute, on which the notes given are based
- 22 Prepared from a 'Historical note' published in the 'Union of Lancashire and Cheshire Institutes: One-hundredth Annual Report 1938-39', pp. 111-129

- 23 Obituary notice, *Post & Mercury*, 28th November 1929
PIKE, W. T. (Ed.): 'Liverpool and Birkenhead in the 20th Century' (1911), biographical note
- 24 'The first page of the history of University College, Liverpool, or the story of its foundation' told by one of the Honorary Secretaries, Dr. J. Campbell Brown, (Marples, Liverpool, 1892)
- 25 Hodder & Stoughton, 1931
- 26 THOMSON, J. J.: 'Recollections and reflections' (Bell & Sons, 1936), p. 409
- 27 'Past years', p. 214
- 28 APLEYARD, R.: 'The history of the Institution of Electrical Engineers (1871-1931)' (*IEE*, 1939), p. 293
- 29 *Jnl. IEE*, 1962-63, **VII**, obituary notice
- 30 'Opening of Laboratory of Electrotechnics, July 8, 1905' (University of Liverpool Press, 1905)
- 31 A brief description of the new building is given in a booklet entitled 'Electrical engineering and electronics' (University of Liverpool)

CHAPTER 3

- 1 'The laws and a report of the first two years' Proceedings of the Polytechnic Society, Liverpool' (1841), p. 5
- 2 *Ibid.*
- 3 The quotations which follow are extracted from the *Transactions of the Liverpool Polytechnic Society*, and later the society's *Journal*. The rules and byelaws were often included with annual reports. They appear to have been published finally in 1896
- 4 *Trans. IEE*, 1926, **XLVII**, pp. 171-202
- 5 Op. cit., 1881, **I**, p. 49
- 6 *Ibid.*
- 7 *Ibid.* p. 61
- 8 *Ibid.*, p. 32
- 9 *Ibid.*
- 10 *Ibid.*, p. 37
- 11 *Ibid.*, p. 35
- 12 *Ibid.*, p. 36
- 13 *Ibid.*, p. 37
- 14 *Ibid.*, pp. 112-25
- 15 Op. cit., 1881-82, (1883), **III**, pp. 74-82
- 16 Op. cit., 1883, (1884), **IV**, pp. 91-102
- 17 Op. cit., 1885, (1886), **VI**, pp. 54-62
- 18 *Ibid.*, pp. 150-72
- 19 Op. cit., 1887, (1888), **VII**, pp. 43-55
- 20 *Ibid.*, p. 133
- 21 *Ibid.*, p. 134
- 22 Op. cit., 1888, (1889), **IX**, p. 16
- 23 Op. cit., 1889-90, (1890), **XI**, pp. 94-111
- 24 Op. cit., 1890-91, (1891), **XII**, pp. 18-31
- 25 *Ibid.*, pp. 32-42
- 26 Op. cit., 1894, **XV**, pp. 86-94
- 27 Op. cit., 1895, **XVI**, pp. 1-23
- 28 Op. cit., 1896, **XVII**, pp. 113-121
- 29 Op. cit., 1898, **XIX**, pp. 141-143
- 30 Op. cit., 1899, **XX**, p. 8
- 31 Op. cit., 1900, **XXI**, p. 9
- 32 *Ibid.*, pp. 89-113
- 33 *Ibid.*, pp. 149-152

- 34 An interesting account of Marconi's contribution to wireless telegraphy will be found in 'A history of the Marconi Company' by W. J. Baker (Methuen, 1970)
- 35 Op. cit., 1904, **XXV**, pp. 58-68
- 36 *Ibid.*, pp. 74-96
- 37 *Ibid.*, pp. 142-175
- 38 *Ibid.*, pp. 184-203
- 39 Op. cit., 1909, **XXX**, pp. 163-179
- 40 Op. cit., 1914, **XXXV**, pp. 115-128
- 41 Op. cit., 1915, **XXXVI**, pp. 207-224
- 42 Op. cit., 1916, **XXXVII**, pp. 154-172

CHAPTER 4

- 1 APLEYARD: pp. 165-167
- 2 CARR, L. H. A.: 'The history of the North-Western Centre of the Institution of Electrical Engineers' (*IEE*, 1950), p. 20. This publication was reissued in 1968 with an additional chapter by H. G. Bell, covering the years 1950-67. The work includes a short history of the Northern Society of Electrical Engineers
- 3 *Ibid.*, p. 11
- 4 'The Proceedings of the Northern Society of Electrical Engineers', available in the *IEE* Library
- 5 *Jnl. IEE*, 1919, **57**, p. 338
- 6 CARR: p. 46
- 7 Minutes of the 1st Committee Meeting held on the 21st November 1919
- 8 *Jnl. IEE*: 1920, **58**, pp. 638-639
- 9 *Ibid.*, pp. 858-869
- 10 *Ibid.*, p. 572
- 11 Op. cit., 1921, **59**, pp. 56-60
- 12 *Ibid.*, pp. 94-107
- 13 *Ibid.*, pp. 181-213
- 14 *Ibid.*, pp. 389-402
- 15 Op. cit., 1922, **60**, pp. 43-48
See obituary notice, *Jnl. IEE*, July-Dec. 1940, **87**, p. 711
- 16 *Ibid.*, pp. 308-314
- 17 Minutes, Liverpool Sub-Centre, 16th January 1922
- 18 *Jnl. IEE*, 1922, **60**, p. 398
- 19 *Ibid.*, pp. 287-298
- 20 Op. cit., 1923, **61**, pp. 31-34
- 21 Minutes, Liverpool Sub-Centre, 13th November 1922

CHAPTER 5

- 1 *Jnl. IEE*, 1923, **61**, pp. 417-424
- 2 *The Times*, obituary notice, 3rd July 1961
- 3 *Jnl. IEE*, 1924, **62**, pp. 31-36
The biographical details are based on an obituary notice published in the *Jnl. IEE*, 1937, **81**, July-Dec., pp. 819-20
- 4 *Ibid.*, pp. 385-418
- 5 *Ibid.*, pp. 729-755
- 6 Op. cit., 1925, **63**, 305-308
- 7 *Ibid.*, pp. 69-113
- 8 *Ibid.*, pp. 157-172
- 9 *Ibid.*, pp. 521-536

- 10 Op. cit., 1926, **64**, pp. 21–24
Biographical details will be found in the obituary notice published in the *Jnl. IEE*, 1931, **69**, p. 1322
- 11 *Ibid.*, pp. 193–200
- 12 *Ibid.*, p. 208
- 13 *Ibid.*, pp. 97–125
- 14 *Ibid.*, pp. 289–301
- 15 *Ibid.*, pp. 1098–1148
- 16 Op. cit., 1927, **65**, pp. 29–33
- 17 *Ibid.*, pp. 97–112
- 18 Michael Faraday's work is described in 'Experimental researches in electricity', in three volumes, originally published in London in 1839, 1844 and 1855, respectively. The material consists of papers reprinted from various journals, including the *Proceedings of the Royal Institution*. The work was reissued by Dover Publications, New York, in 1965, in three volumes, and in the UK by Constable
- 19 *Jnl. IEE*, 1927, **65**, pp. 674–680
Biographical details will be found in the *Jnl. IEE*, 1944, **91**, Pt. 1, p. 475
- 20 *Jnl. IEE*, 1927, **65**, pp. 733–751
- 21 *Ibid.*, pp. 752–761
- 22 Op. cit., 1928, **66**, pp. 39–43
- 23 *Ibid.*, pp. 125–130
- 24 *Ibid.*, pp. 712–734
- 25 Op. cit., 1946, **93**, Pt. 1, pp. 614–615
- 26 Op. cit., 1929, **67**, pp. 30–34
- 27 *Ibid.*, pp. 217–240
- 28 *Ibid.*, pp. 937–945
- 29 Op. cit., 1930, **68**, pp. 51–56
- 30 *Ibid.*, p. 753
- 31 *Ibid.*, pp. 657–665
- 32 *Ibid.*, pp. 1369–1453
- 33 Op. cit., 1931, **69**, pp. 39–45
- 34 *Ibid.*, pp. 1357–1362
- 35 Op. cit., 1931–32, **70**, pp. 47–53
- 36 *Ibid.*, pp. 189–235
- 37 Op. cit., 1933, **72**, pp. 37–40
- 38 *Ibid.*, pp. 1–10
- 39 *Ibid.*, pp. 189–220
- 40 Op. cit., 1933, **73**, pp. 97–113

CHAPTER 6

- 1 *Jnl. IEE*, 1934, **74**, pp. 49–54
- 2 *Ibid.*, pp. 285–297
- 3 Op. cit., 1935, **76**, pp. 26–34
- 4 *Ibid.*, pp. 241–258
- 5 Op. cit., Jan.–June 1936, **78**, pp. 28–33
- 6 *Ibid.*, pp. 123–140
- 7 *Ibid.*, p. 121
- 8 Op. cit., July–Dec. 1936, **79**, pp. 617–627
- 9 Op. cit., Jan.–June 1937, **80**, pp. 41–45
- 10 *Ibid.*, pp. 237–268
- 11 Op. cit., July–Dec. 1937, **81**, pp. 821–822
- 12 Op. cit., Jan.–June 1938, **82**, pp. 44–48
- 13 *Ibid.*, pp. 565–582
- 14 Op. cit., Jan.–June 1939, **84**, pp. 38–42
- 15 Op. cit., July–Dec. 1938, **83**, pp. 437–455

- 16 *Ibid.*, pp. 729–757
- 17 *Ibid.*, pp. 758–792
- 18 Op. cit., **84**, pp. 597–609
- 19 Op. cit., July–Dec. 1938, **83**, pp. 581–617
- 20 Op. cit., Jan.–June 1939, **84**, 'Report of the Council for 1938–1939'

CHAPTER 7

- 1 *Jnl. IEE*, Jan.–June 1940, **86**, p. 506
- 2 *The Times*, obituary notice, 27th May 1972
- 3 Personal communication dated 27th December 1971
- 4 *Jnl. IEE*, Jan.–June 1940, **86**, pp. 27–30
- 5 *Ibid.*, pp. 345–354
- 6 Op. cit., July–Dec. 1940, **87**, pp. 76–100
- 7 *Ibid.*, pp. 461–473
- 8 *Ibid.*, pp. 615–624
- 9 *Ibid.*, pp. 625–656
- 10 Op. cit., 1941, **88**, General, Pt. I, pp. 84–87
- 11 Op. cit., Jan.–June 1940, **86**, pp. 225–239
- 12 *Ibid.*, p. 351
- 13 Op. cit., 1942, **89**, Pt. I, pp. 77–80
- 14 *Ibid.*, Pt. III, pp. 43–64
- 15 *Ibid.*, p. 244
- 16 Op. cit., 1943, **90**, Pt. I, pp. 67–70
- 17 *Ibid.*, p. 4
- 18 Personal communication from J. Cormack, dated 27th December 1971
- 19 *Jnl. IEE*, 1944, **91**, Pt. I, pp. 65–69
- 20 *Ibid.*, Pt. II, pp. 35–51
- 21 Op. cit., 1943, **90**, Pt. III, pp. 90–114
- 22 Op. cit., 1945, **92**, Pt. I, pp. 69–72
- 23 Personal communication dated 27th December 1971
- 24 *Jnl. IEE*, 1945, **92**, Pt. I, p. 2 and p. 225
- 25 *Ibid.*, Pt. III, pp. 255–267

CHAPTER 8

- 1 *Jnl. IEE*, 1946, **93**, Pt. I, pp. 74–78
- 2 Op. cit., 1947, **94**, Pt. I, pp. 83–86
- 3 *Ibid.*, pp. 233–242
- 4 Op. cit., 1948, **95**, Pt. I, p. 79
- 5 *Ibid.*, Pt. II, pp. 470–479
- 6 Op. cit., 1949, **96**, Pt. I, pp. 9–10
- 7 *Ibid.*, p. 225
- 8 'Liverpool University: a Jubilee book', 1953, p. 30
- 9 The first report of the British Electricity Authority for the period 13th August 1947 to 31st March 1949 was published in January 1950

CHAPTER 9

- 1 *Proc. IEE*, 1952, **99**, Pt. I, pp. 16–17
- 2 *Ibid.*, pp. 75–88
- 3 *Ibid.*, Pt. II, pp. 189–202
- 4 Op. cit., 1953, **100**, Pt. I, pp. 12–13

- 5 Op. cit., 1952, **99**, Pt. II, pp. 297-309
- 6 Op. cit., 1954, **101**, Pt. I, pp. 15-16
- 7 Op. cit., 1953, **100**, Pt. II, pp. 115-124
- 8 *Ibid.*, Pt. I, p. 253
- 9 Op. cit., 1955, **102**, Pt. A, pp. 1-6
- 10 *Ibid.*, pp. 157-158
- 11 *J. IEE*, 1955, **1**, pp. 179-180
- 12 Op. cit., 1958, **4**, pp. 15-21
- 13 Op. cit., 1957, **3**, pp. 142-148
- 14 *Proc. IEE*, 1958, **105**, A, pp. 22-23
- 15 *J. IEE*, 1958, **4**, pp. 282-283, 551-552
- 16 *Jnl. IEE*, 1951, **98**, p. 169
- 17 *Proc. IEE*, 1959, **106**, Pt. A, pp. 104-106
- 18 Op. cit., 1960, **107**, Pt. B, pp. 16-18

CHAPTER 10

- 1 *Proc. IEE*, 1961, **108**, Pt. A, pp. 25-26
- 2 CARR: p. 47
- 3 *J. IEE*, 1962, **8**, p. 125
- 4 *Proc. IEE*, 1963, **110**, (1), pp. 1034-1035
- 5 COOPER, A. R.: 'Sebastian de Ferranti—pioneer of power', *Electron. & Power* 1964, **10**, pp. 402-405.
A booklet entitled 'S. Z. de Ferranti: a brief account of some aspects of his work' was prepared by Arthur Ridding, A.M.S.A., (*AM*), who at that time was the Archivist of the Ferranti Collection of manuscripts, printed documents and photographs. It was published by HMSO for the Science Museum, South Kensington, in the Centenary year
- 6 The biographical details have been compiled from the *Jnl. IEE*, 1930, **68**, obituary notice, pp. 1532-1533, and 'The life and letters of Sebastian Ziani de Ferranti' by Gertrude Ziani de Ferranti and Richard Ince (Williams & Norgate, 1934, reprinted 1956)
- 7 The original drawing is in the Ferranti Archives. It has not been reproduced previously
- 8 Ferranti and Ince, p. 120
- 9 *Electron. & Pwr.*, 1965, **11**, pp. 272-275
- 10 *Proc. IEE*, 1968, **115**, pp. 100-102
- 11 'The University of Liverpool calendar'
- 12 The biographical notes have been based mainly on the 'Profile' published in the *J. IEE*, 1968, **14**, p. 416
- 13 A shortened version is published in the *J. IEE*, 1968, **14**, pp. 431-433
- 14 *Proc. IEE*, Jan.-June 1969, **116**, pp. 167-168

CHAIRMEN OF THE SUB-CENTRE AND CENTRE

CHAIRMEN OF THE LIVERPOOL SUB-CENTRE OF THE NORTH-WESTERN CENTRE

1919-20	E. W. Marchant	1921-22	G. H. Nisbett
1920-21	H. Dickenson	1922-23	B. Welbourn*

* Mr. Welbourn became the first Chairman of the Mersey & North Wales (Liverpool) Centre in February 1923

CHAIRMEN OF THE MERSEY & NORTH WALES (LIVERPOOL) CENTRE

1923-24	L. M. Hollingworth	1933-34	B. Welbourn
1924-25	H. H. Harrison	1934-35	R. G. Devey
1925-26	A. E. Malpas	1935-36	O. C. Waygood
1926-27	P. J. Robinson	1936-37	F. E. Spencer
1927-28	F. J. Teago	1937-38	G. K. Paton
1928-29	S. E. Britton	1938-39	E. L. Morland
1929-30	E. W. Marchant	1939-40	W. Holttrum
1930-31	A. J. Pratt	1940-41	J. E. Nelson
1931-32	P. M. Hogg	1941-42	E. G. Taylor
1932-33	A. C. Livesey	1942-43	H. Pryce-Jones

CHAIRMEN OF THE MERSEY & NORTH WALES CENTRE

1943-44	T. E. Houghton	1958-59	J. Collins
1944-45	J. B. Cormack	1959-60	T. A. P. Colledge
1945-46	J. O. Knowles	1960-61	D. A. Picken
1946-47	R. Varley	1961-62	R. N. Pegg
1947-48	P. C. Barnes	1962-63	J. A. Mason
1948-49	T. B. D. Terroni	1963-64	W. J. J. Curry
1949-50	D. C. Fleming	1964-65	J. M. Cowan
1950-51	J. Eccles	1965-66	D. M. MacLaren
1951-52	E. W. Ashby	1966-67	E. Jacks
1952-53	W. A. Hatch	1967-68	F. J. Hyde
1953-54	T. Coates	1968-69	E. F. Duncan
1954-55	P. R. Dunn	1969-70	S. Towill
1955-56	J. M. Meek	1970-71	D. H. C. McAuslan
1956-57	P. d'E. Stowell	1971-72	C. E. R. Fairburn
1957-58	T. Makin	1972-73	D. G. Gwyn

HONORARY SECRETARIES OF THE
SUB-CENTRE AND CENTRE

HONORARY SECRETARY OF THE LIVERPOOL SUB-CENTRE
OF THE NORTH-WESTERN CENTRE

1919-23 O. C. Waygood

HONORARY SECRETARIES OF THE MERSEY & NORTH
WALES (LIVERPOOL) CENTRE

1923-35 O. C. Waygood

1935-43 W. Parry

HONORARY SECRETARIES OF THE MERSEY & NORTH
WALES CENTRE

1943-45 W. Parry

1960-64 G. S. Shepherd

1945-54 A. V. Milton

1964-67 B. F. Tickle

1954-56 J. W. Lynn

1967-69 G. W. Launder

1956-60 S. Towill

1969-72 H. Currie

1972- D. B. McRobert

HONORARY TREASURERS OF THE
SUB-CENTRE AND CENTRE

HONORARY TREASURER OF THE LIVERPOOL SUB-CENTRE
OF THE NORTH-WESTERN CENTRE

1919-23 O. C. Waygood

HONORARY TREASURERS OF THE MERSEY & NORTH
WALES (LIVERPOOL) CENTRE

1923-25 O. C. Waygood

1925-34 L. Breach

1934-43 R. B. C. Stirrup

HONORARY TREASURERS OF THE MERSEY & NORTH
WALES CENTRE

1943-47 R. B. C. Stirrup

1961-69 S. Towill

1947-61 W. Parry

1969- N. Clarke

MEMBERSHIP

Year	Members	Associate Members	Companions	Associates	Graduates	Students	Total
1930	63	188	-	58	52	104	463
1945	81	310	-	56	164	284	895
1950	107	393	2	88	230	286	1186
1955	97	497	2	85	401	170	1252
1960	114	641	2	86	514	155	1512
1965	136	709	2	76	554	220	1697

Year	Fellows	Members	Com- panions	Associates (former class)	Associate Members	Associates (new class)	Students	Total
1970	156	765	3	46	688	65	194	1917