



PROCEEDINGS 1969
Volume 2b

41st CONVENTION

16th to 19th JUNE, 1969

UMTALI

The Association of Municipal Electricity
Undertakings of Southern Africa

VERRIGTINGS 1969
Deel 2b

41ste KONVENSIË

16de tot 19de JUNE 1969

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Agter Ry.

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 1960 Castelyn, F. J. C., la Arboretum Avenue,
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 1963 (1944) Downey, J. C., 10 Jessop Road, Selection
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 1963 (1947) Downie, C. G., 25 Rectory Gardens,
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 1969 (1939) Giles, P. A., Box/Bus 384, Pretoria.*
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 1954 (1938) Kinsman, C., 7 Highgate Place,
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 1956 (1939) Milton, W. H., c/o Electricity Supply
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 1962 (1948) Mitchell, J. E., Box/Bus 487,
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 1964 (1934) Muller, G. J., 35 Wilcocks Road,
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 (Past President).
 1959 Beard, G. R., Town Electrical Engineer, Box/Bus 176, Grahamstown.
 1969 Bernhardt, J. L. Borough & Electrical Engineer, Box/Bus 72, Stanger.
 1957 Booyens, L., Town & Electrical Engineer, Box/Bus 155, Vrede, O.F.S.
 1960 Boshoff, J. J., Assistant Electrical Engineer, Box/Bus 3, Vanderbijlpark.
 1962 Boshoff, M. H. L., Assistant Electrical Engineer, Box/Bus 45, Uitenhage.
 1959 Botes, P. J., Municipal Electrical Engineer, Box/Bus 217, Roodepoort.
 1958 Brown, D. C., Electrical Engineer, Box/Bus 130, Bethlehem.
 Buchanan, E. G., Electrical Engineer, Box/Bus 48, Ermelo.

1960 Vanderbijlpark, Box/Bus 3.
 1949 Ventersdorp, Box/Bus 15.
 1935 Vereeniging, Box/Bus 35.
 1955 Virginia, Box/Bus 156.
 1947 (1929) Vrede, Box/Bus 155.
 1935 Vryburg, Box/Bus 35.
 1948 (1920) Vryheid, Box/Bus 57.
 1960 White River, Box/Bus 2.
 1955 Warmbaths, Box/Bus 48.
 1956 Wellington, Box/Bus 12.
 1953 Welkom, Box/Bus 708.
 1953 Westonaria, Box/Bus 19.
 1946 Willowmore, Box/Bus 15.
 1944 (1919) Winburg, Box/Bus 26.
 1945 (1924) Windhoek, Box/Bus 59.
 1955 (1927) Witbank, Box/Bus 3.
 1936 (1922) Worcester, Box/Bus 37.
 1960 Walvis Bay, Box/Bus 2.
 1964 Wolmaransstad, Box/Bus 17.

Datums in Hakies verteenwoordig eerste lidmaatskap as of deur bemiddeling van Ingenieur, Lidmaatskap nie noodwendig aaneenlopend nie.

1959 Carpenter, B. F., Town Electrical Engineer, Box/Bus 45, Umtata.
 1948 Cherry, J. R., Municipal Electrical Engineer, Box/Bus 139, Randfontein.
 1955 Clarke, M. P. P., Municipal Electrical Engineer, Box/Bus 21, Somerset East.
 1956 Craig, J. S. Borough Electrical Engineer, Box/Bus 21, Newcastle.
 1969 Chappel, M. J. W., Deputy City Electrical Engineer, Box/Bus 369, Port Elizabeth.
 1965 Cronje, W. F., Electrical Engineer, Peri-Urban Areas Health Board, Box/Bus 1341, Pretoria.
 1969 Catchpole, T. D., Borough Engineer, Box/Bus 5, Howick.
 1956 Dawson, J. D., Municipal Electrical Engineer, Box/Bus 45, Uitenhage.
 1955 De Villiers, E. E., City Electrical Engineer, Box/Bus 288, Bloemfontein.
 1964 De Villiers, S. de V., Municipal Electrical Engineer, Box/Bus 44, Ceres.
 1957 Dreyer, H. C., Electrical Engineer, Box/Bus 12, Paarl.
 1950 Dreyer, L., Municipal Electrical Engineer, Box/Bus 19, Westonaria.
 1957 Dunstan, R. S., City Electrical Engineer, Box/Bus 369, Port Elizabeth.
 1963 Du Plooy, D. P. Electrical Engineer, Box/Bus 45, Nelspruit.
 1963 Du Plessis, G. C., Deputy Town Electrical Engineer, Box/Bus 113, Potchefstroom.
 1968 Du Plessis, C. P. Electrical Engineer, Box/Bus 42, De Aar.

- 1963 Du Toit, A. A., Municipal Electrical Engineer
Box/Bus 19, George.
- 1955 De Villiers, E. E., Box/Bus 288, Bloemfontein.
- 1950 Erikson, J. G. F., Borough Electrical Engineer
Box/Bus 15, Estcourt, Natal.
- 1944 Fisher, K. M., Municipal Electrical Engineer,
Box/Bus 3, Bedfordview.
- 1957 Fohren, H., Borough Electrical Engineer,
Box/Bus 37, Eshowe, Zululand.
- 1966 Fortman, A. H. L., Town Electrical Engineer,
Box/Bus 215, Boksburg.
- 1961 Frantz, A. C. T., City Electrical Engineer,
Box/Bus 82, Cape Town.
- 1952 Fitcher, L., Municipal Electrical Engineer,
Box/Bus 13, Kempton Park.
- 1965 Fraser, D. H., Deputy City Electrical Engineer,
Box/Bus 147, Durban.
- 1968 Foden, H., Deputy City Electrical Engineer,
Box/Bus 73, Salisbury.
- 1968 Gerber, A., Assistant Electrical & Mechanical
Engineer, Box/Bus 94, Krugersdorp.
- 1945 Gericke, J. M., Municipal Electrical Engineer,
Box/Bus 99, Klerksdorp.
- 1949 Halliday, K. W. J., Municipal Electrical
Engineer, Box/Bus 5, Port Shepstone, Natal.
- 1927 Harvey, A. O., Town Electrical Engineer,
Box/Bus 96, Louis Trichardt.
- 1953 Hatwich, A. H. J., Town & Electrical Engineer
Box/Bus 13, Dewetsdorp, O.F.S.
- 1965 Heydenrych, J. E., Electrical Engineer,
Box/Bus 14, Middelburg.
- 1956 Hobbs, I. L., Town Electrical Engineer,
Box/Bus 156, Virginia.
- 1944 Inglis, J. L., Town Electrical & Water Engineer
Box/Bus 111, Pietersburg.
- Jones, J. N., City Electrical Engineer, Box/Bus
1803, Bulawayo, Rhodesia.
- 1949 Kirberger, M. N., Town Electrical Engineer,
Box/Bus 3, Bethal, Tvl.
- 1959 Koeslag, H. J., Electrical Engineer, Box/Bus
52, Robertson.
- 1949 Kruger, M. J. C., Municipal Electrical Engineer
Box/Bus 13, Port Alfred.
- 1931 Lategan, J. F., Town Electrical Engineer,
Box/Bus 17, Stellenbosch.
- 1953 Lees, D., Town Electrical Engineer, Box/Bus
45, Benoni, Tvl.
- 1944 Leishmann, R., General Manager, Electricity
Department, Box/Bus 699, Johannesburg.
- 1956 Lewis, L., Town Electrical Engineer, Box/Bus
59, Windhoek, S.W.A.
- 1947 Lombard, C., City Electrical Engineer, Box/
Bus 145, Germiston, Tvl. (Past President).
- 1944 Lotter, G. A., Town Electrical Engineer, Box/
Bus 34, Potgietersrust, Tvl.
- 1966 Louw, H. A. L., Asst. Electrical Engineer,
Box/Bus 12, Paarl, C.P.
- 1955 Lynch, E. C., City Electrical Engineer, Box/
Bus 73, Salisbury, Rhodesia.
- 1953 Macques, J. A., Municipal Electrical Engineer
Box/Bus 42, De Aar, C.P.
- 1966 MacHutchon, J. F., Asst. Electrical Engineer,
Box/Bus 82, Cape Town.
- 1948 McIntyre, H. A., Assistant Town Electrical
Engineer, Box/Bus 35, Vereeniging.
- 1954 McNeil, J. L., Town Electrical Engineer, Box/
Bus 8, Kokstad.
- 1968 McWilliam, E. A., City Electrical Engineer,
Box/Bus 423, Pretoria.
- 1945 Meintjies, P. A., Municipal Electrical Engineer
Box/Bus 16, Rustenburg, Tvl.
- 1952 Millen, T. J., Town and Electrical Engineer,
Box/Bus 24, Tzaneen, Tvl.
- 1929 Mocke, T. M., Town and Electrical Engineer,
Box/Bus 23, Piet Retief, Tvl.
- 1969 Mostert, S. A., Electrical Engineer, Box/Bus
9, Beaufort West.
- 1968 Murphy, K. J., Municipal Electrical Engineer,
Box/Bus 24, Cradock.
- 1968 Muir, J. W. S., Electrical Engineer, Box/Bus
21, Knysna.
- 1964 Odendaal, M. W., Town Electrical Engineer,
Box/Bus 4, Alberton, Tvl.
- 1957 Paull, R. A., Borough and Electrical Engineer,
Box/Bus 57, Vryheid.
- 1963 Peters, A. G., Town Electrical Engineer, Box/
Box/Bus 278, Gwelo, Rhodesia.
- 1951 Pretorius, D. R., Town Electrical Engineer,
Box/Bus 39, Parys, O.F.S.
- 1952 Pretorius, E. d C., Electrical Engineer, Box/
Bus 113, Potchefstroom, Tvl.
- 1960 Pretorius, J. W., Assistant Electrical Engineer,
Box/Bus 23, Nigel, Tvl.
- 1969 Phillips, F. W., Town Electrical Engineer, Box/
Bus 25, Mossel Bay.
- 1968 Psotta, K. U., Elektrotegniese Ingenieur, Box/
Bus 25, Keetmanshoop.
- 1969 Plowden, D. C., Deputy General Manager,
Box/Bus 699, Johannesburg.
- Potgieter, N. A., Electrical Engineer, Box/Bus
66, Sanderton.
- 1961 Ratvey, W. P., Electrical Engineer, Box/Bus 3,
Strand.
- 1957 Rautenbach, G. F., Electrical Engineer, Box/
Bus 99, Klerksdorp.
- 1948 Reyneke, G. M., Town Electrical Engineer,
Box/Bus 26, Winburg.
- 1966 Robertson, F. H., Electrical Engineer, Box/Bus
19, George, C.P.
- 1935 Rossler, W., Town Electrical Engineer, Box/
Bus 302, Kroonstad, O.F.S.
- 1968 Robson, K. G., City Electrical Engineer, Box/
Bus 529, East London.
- 1968 Roberson, W., Town Electrical Engineer, Box/
Bus 20, Hermanus.

- 1944 Rush, W., Borough Electrical Engineer, Box/Bus 76, Dundee.
- 1953 Simpson, R. M. O., City Electrical Engineer, Box/Bus 147, Durban, Natal. (Past President)
- 1962 Stanton, R. J. G., Deputy Town Electrical Engineer, Box/Bus 255, Oudtshoorn, C.P.
- 1934 Stevens, F., Borough Electrical Engineer, Box/Bus 29, Ladysmith, Natal.
- 1965 Strauss, J. C., Town Electrical Engineer, Box/Bus 60, Sasolburg, O.F.S.
- 1956 Sulter, F. J., Assistant Electrical Engineer, Box/Bus 145, Germiston, Tvl.
- 1962 Surtees, E. H., Assistant Electrical Engineer, Box/Bus 215, Boksburg.
- 1968 Snyman, J. C., Town Electrical Engineer, Box/Bus 15, Ventersdorp.
- 1962 Te Brugge, E. J., Town Electrical Engineer, Box/Bus 42, Mafeking, C.P.
- 1946 Theron, G. C., Town Electrical Engineer, Box/Bus 3, Vanderbijlpark, Tvl.
- 1945 Theron, W. C., Municipal Electrical Engineer, Box/Bus 37, Worcester, C.P.
- 1966 Trautmann, E. P. E. W., Town Electrical Engineer, Box/Bus 61, Lydenburg.
- 1950 Turnbull, A. F., Town Electrical Engineer, Box/Bus 35, Vereeniging, Tvl.
- 1931 Turner, H. T., Town Electrical Engineer, Box/Bus 121, Umtali, Rhodesia.
- 1964 Van den Berg, A. J., Town Electrical Engineer Box/Bus 94, Krugersdorp, Tvl.
- 1964 Van der Merwe, D. S., Electrical Engineer, Box/Bus 3, Witbank.
- 1955 Van der Merwe, F. J., Municipal Electrical Engineer, Box/Bus 20, Stilfontein, Tvl.
- 1957 Van Heerden, W. J., Electrical Engineer, Box/Bus 201, Heidelberg, Tvl.
- 1956 Van Meerdervoort, J. K. L. Pompe, Town Electrical Engineer, Box/Bus 33, Barberton.
- 1967 Van Schalkwyk, A. P., Deputy City Electrical Engineer, Box/Bus 288, Bloemfontein, O.F.S.
- 1965 Van Wyk, A. A., Town Electrical Engineer, Box/Bus 9, Meyerton, Tvl.
- 1966 Van Wyk, Schoombee, Electrical Engineer, Box/Bus 12, Bothaville.
- 1945 Vergottini, P. L., Town and Electrical Engineer, Box/Bus 48, Warmbaths.
- 1951 Verschoor, D. R., Town & Electrical Engineer Box/Bus 36, Fort Beaufort, C.P.
- 1957 Von Ahlften, J. K., Town Electrical Engineer, Box/Bus 45, Springs, Tvl.
- 1954 Waddy, J. C., City Electrical Engineer, Box/Bus 399, Pietermaritzburg.
- 1952 Williams, A. H., Assistant Electrical Engineer, Box/Bus 45, Springs.

Technical Associates/Tegniese-Geassosieerders :

- 1965 Barnard, W., Assistant General Manager,

- (Technical Administration) Electricity Department, Box/Bus 699, Johannesburg.
- 1968 Brink, H. J., Section Engineer, Generation, Box/Bus 288, Bloemfontein.
- 1968 Briers, D. B. Planning Engineer, Box/Bus 288, Bloemfontein.
- 1968 De Vries, G. S., Section Engineer, Distribution Box/Bus 288, Bloemfontein.
- 1968 Reichert, W. J., Assistant Electrical Engineer, Box/Bus 20, Stilfontein.

Associates/Geassosieerders :

- 1968 Dauth, W. J., Town Electrical Engineer, Box/Bus 5, Postmasburg.
- 1965 De Bruyn, Town Electrical Engineer, Box/Bus 17, Willowmore, C.P.
- 1965 De Jager, M. J., Electrical Engineer, Box/Bus 37, Viljoenskroon.
- 1962 De Witt, F., Electrical Engineer, Box/Bus 38, Adelaide, C.P.
- 1969 Goussard, P. J., Hoof Elektriesien, Box/Bus 14, Koppies.
- 1966 Hugo, J. C., Electrical Engineer, Box/Bus 51, Bredasdorp.
- 1962 Huysamen, G. A., Electrical Engineer, Box/Bus 5, Postmasburg.
- 1969 Jantzen, G. H., Town Electrical Engineer, Box/Bus 206, Aliwal North.
- 1966 Jooste, P. M., Electrical Engineer, Box/Bus 44, Messina.
- 1959 Laas, C. P., Electrical Engineer, Box/Bus 15, Kenhardt.
- 1969 Louw, A., Town Electrical Engineer, Box/Bus 174, Kakamas.
- Lochner, J. van S., Electrical Engineer, Box/Bus 106, Brits.
- 1956 McNamara, A. B., Electrical Engineer, Box/Bus 21, Komga, C.P.
- Munro, J. A., Town Electrical Engineer, Box/Bus 18, Bloemhof.
- 1969 Nieuwenhuis, J. F., Electrical Engineer, Box/Bus 17, Wolmaransstad.
- 1969 Pretorius, P. J. R., Town Electrical Engineer, Box/Bus 35, Vryburg.
- 1969 Pieterse, A. C., Electrical Engineer, Box/Bus 64, Ladybrand.
- 1969 Pollock, T., Electrical Engineer, Box/Bus 3, Gordon's Bay.
- 1962 Van der Schyff, G. W., Town Electrical Engineer, Box/Bus 24, Carolina.
- 1965 Wilson, A. McD., Town Electrical Engineer, Box/Bus 17, Fort Victoria.

Associate Members/Verbonde Lede :

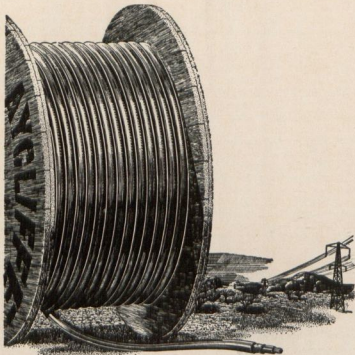
- 1946 Andrew, W. N., 7 Tainton Avenue, Bonnie Doon, East London.
- 1951 Attridge, W. H., Box/Bus 412, Sasolburg, O.F.S.

- 1944 Burton, C. R., 54 Memorial Road, Kimberley.
- 1956 Barnard, F. J. W., c/o Electricity Supply Commission, Box/Bus 12, Springs.
- 1960 Bozyczko, W. B., 2 Hans Merensky Street, P.O. Swartklip, Tvl.
- 1948 Conradie, D. J. R., Box/Bus 1009, Bloemfontein
- 1954 Coetzee, F. J., Box/Bus 3, Vanderbijlpark.
- 1934 Dawson, C., Electricity Supply Commission, Box/Bus 2408, Durban.
- 1960 Ford, W. P., Box/Bus 40, Lusaka, Zambia.
- 1953 Haig-Smith, D., Assistant Municipal Electrical Engineer, Box/Bus 113, Queenstown, (Previously of Cradock).
- 1936 Heasman, G. G., Box/Bus 77, Fort Victoria, Rhodesia.
- 1962 Honiball, G. T., 111 Church Street, Kempton Park, Tvl.
- 1962 Liebenberg, S. J., Electrical and Mechanical Engineer, Department of Bantu Administration and Development, Box/Bus 384, Pretoria.
- 1960 McGibbon, J., Box/Bus 164, Carletonville.
- 1948 Matthews, J. A., Box/Bus 616, Kimberley.
- 1946 Mole, E. W., Box/Bus 118, Bramley, Johannesburg.
- 1926 Muller, H. M. S., Box/Bus 112, Upington, C.P.
- 1961 Magowan, J. M., Rhodesia Electricity Supply Commission, Box/Bus 377, Salisbury.
- 1934 Rossler, A., 3 Greenwood Road, Pietermaritzburg.
- 1953 Rothman, J. L., Box/Bus 606, Kimberley.
- 1966 Thackewray, W. G., c/o Golden Crest Hotel, 57 Abel Road, Berea, Johannesburg.
- 1948 Woolridge, W. E. L., Box/Bus 24, Harding, Natal.
- 1947 Williams, J. T. Box/Bus 1617, Pretoria.
- 1946 Wylie, R. J. S., c/o E.S.C. Rand Undertaking, Box/Bus 103, Germiston.
- 1957 Zeederberg, T. D., 43 Jack Hindon Street, Pretoria North.
- 1957 Alcan Aluminium of S.A. Ltd., Box/Bus 2430, Johannesburg.
- 1957 Arthur Trevor Williams (Pty.) Ltd., Box/Bus 2873, Johannesburg.
- 1959 Asea Electric (Pty.) Ltd., Box/Bus 691, Pretoria
- 1957 Aycliffe Cables Ltd., Box/Bus 5244, Johannesburg.
- 1960 Associated Electrical Industries (Pty.) Ltd., Box/Bus 7755, Johannesburg.
- 1965 Ballenden & Robb, Box/Bus 4648, Johannesburg.
- 1963 Bell, Harold E. (Pty.) Ltd., Box/Bus 6906, Johannesburg.
- 1957 Babcock & Wilcox of Africa Ltd., Box/Bus 4561, Johannesburg.
- 1957 Brian Colquhoun O'Donnell & Partners (Rhodesia), 10th Floor, Chester House, Speke Ave., Salisbury.
- 1959 British Insulated Callender's Cables S.A. Ltd., Box/Bus 2827, Johannesburg.
- 1936 W. R. Burnett (Pty.) Ltd., Box/Bus 358, Johannesburg.
- 1969 Biderman, Finn, Beekhuizen & Peen, Box/Bus 1339, Johannesburg.
- 1957 Chloride Electrical Storage Co. S.A. (Pty.) Ltd., Box/Bus 39264, Bramley, Tvl.
- 1957 C.M.B. Engineering Co. (Pty.) Ltd., Box/Bus 55, Denver, Johannesburg.
- 1959 Construction Electric Co. (Pty.) Ltd., Box/Bus 10100, Johannesburg.
- 1964 Crawford Clinksales, Maugham-Brown & Partners, Box/Bus 196, Port Elizabeth.
- 1957 Crompton Parkinson S.A. (Pty.) Ltd., Box/Bus 4236, Johannesburg.
- 1965 Cullinan Refractors Ltd., P.O. Olifantsfontein, Tvl.
- 1957 Davidson & Co. (Africa) (Pty.) Ltd., 207 Biccard House, 24 Biccard Street, Braamfontein, Johannesburg.
- 1957 Dowson & Dobson Ltd., Box/Bus 7764, Johannesburg, Tvl.
- 1959 Ian Drewett, Box/Bus 35, Johannesburg, Tvl.
- 1969, Eberhard-Martin (Pty.) Ltd., Box/Bus 128, Roosevelt Park.
- 1959 Electrical Contractors Association (South Africa), Box/Bus 5327, Johannesburg.
- 1966 Electrical Protection Co., Box/Bus 570, Benoni
- 1957 Enfield Cables (S.A.) Ltd., Box/Bus 5289, Johannesburg, Tvl.
- 1959 English Electric Co. (C.A.) (Pvt.) Ltd., Box/Bus 2191, Salisbury, Rhodesia.
- 1961 Farad, (Pty.) Ltd., Box/Bus 31220, Braamfontein, Transvaal.
- 1957 First Electric Corp. of S.A., Box/Bus 13024, Knights, Tvl.
- 1957 Fuchs Electrical Industries Ltd., Box/Bus 758 Alberton, Transvaal.

Affiliates/Geaffileerders :

- 1959 AEG South Africa (Pty.) Ltd., Box/Bus 10264 Johannesburg.
- 1957 Aberdare Cables (Africa) Ltd., Box/Bus 494, Port Elizabeth.
- 1957 Adams, Ripley & Dürr, Box/Bus 1498, Johannesburg.
(name changed)
- 1957 African Cables, Ltd., Box/Bus 9909, Johannesburg.
- 1969 Amalgamated Power Engineering S.A. (Pty.) Ltd., Box/Bus 38196, Booysens, Johannesburg.
- 1959 African Explosives & Chemical Industries, Ltd. Box/Bus 1122, Johannesburg.
- 1962 African Wire Ropes, Ltd., Box/Bus 72, Cleveland.
- 1957 Allenwest S.A. (Pty.) Ltd., Box/Bus 6168, Johannesburg.

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- 1968 Fluorescent Lighting Corp. S.A. (Pty.) Ltd., Box/Bus 7148, Johannesburg.
- 1969 G.E.C.—English Electric of S.A. (Pty.) Ltd., Box/Bus 2387, Johannesburg.
(name changed).
- 1958 G.E.C.—A.E.I. of S.A. (Pty.) Ltd., Box/Bus 2406, Johannesburg, Transvaal.
- 1957 W. T. Glover & Co. Ltd., Box/Bus 1386, Johannesburg, Transvaal.
- 1957 E. Green & Son. S.A. (Pty.) Ltd. 406 Barclays Bank Buildings, Kruis Street, Johannesburg.
- 1957 Heinemann Electric (S.A.) Ltd., Box/Bus 99, Bramley, Tvl.
- 1957 Hopkinsons S.A. (Pty.) Ltd., Box/Bus 11029, Johannesburg, Tvl.
- 1957 James Howden & Safanco (Africa) (Pty.) Ltd. Box/Bus 9501, Johannesburg, Tvl.
- 1957 Hubert Davies & Co. Ltd., Box/Bus 1386, Johannesburg, Tvl.
- 1960 Hawker Siddeley Brush (Southern Africa) Ltd., Box/Bus 67, Germiston.
- 1957 International Combustion Africa Ltd., Box/Bus 5981, Johannesburg, Tvl.
- 1962 A. Jackson, Box/Bus 4814, Cape Town, C.P.
- 1957 John Thompson, (S.A.) (Pty.) Ltd., Box/Bus 31660, Braamfontein.
- 1957 R. T. Jones, Esq., 43 The Avenue, Orchards, Johannesburg.
- 1968 Kantey, Templar, Loteryman & de Kroon, Room 2, Tudor Court, 4 St. Matthew's Road East London.
(name changed).
- 1967 Keen's Electrical Distributors (Pty.) Ltd., Box/Bus 2656, Johannesburg.
- 1957 Harold Marthinusen & Co. (Pty.) Ltd., Box/Bus 469, Johannesburg, Tvl.
- 1957 L. H. Marthinusen Ltd., Box/Bus 25664, Denver Tvl.
- 1967 Marthinusen & Coutts (Pty.) Ltd., Box/Bus 469, Johannesburg, Tvl.
- 1957 Merz & McLellan, Box/Bus 11578, Johannesburg.
- 1965 Motorola S.A. (Pty.) Ltd., Box/Bus 118, Bramley, Tvl.
- 1959 N.V. Nederlandsche Kabelabrieken Ltd., Box/Bus 3513, Cape Town, C.P.
- 1957 Oerlikon S.A. (Pty.) Ltd., Box/Bus 132, Jeppestown, Tvl.
- 1957 C. A. Parsons & Co. (S.A.) (Pty.) Ltd., Box/Bus 3425, Johannesburg, Tvl.
- 1963 Pratlley Manufacturing and Engineering Co. (Pty.) Ltd., Box/Bus 55, Luiipaardsvlei, Tvl.
- 1957 Reunert & Lenz Ltd., Box/Bus 92, Johannesburg.
- 1957 A. Reyrolle & Co. Ltd., Box/Bus 8080, Elandsfontein.
- 1960 A. Reyrolle & Co. (Rhodesia) Ltd., Box/Bus 1975, Salisbury, Rhodesia.
- 1957 Rice & Diethelm Ltd., Box/Bus 930, Johannesburg.
- 1967 G. S. Rogers (Pty.) Ltd., Box/Bus 3667, Johannesburg.
- 1969 Simplex Electric of S.A. (Pty.) Ltd., Box/Bus 7035, Johannesburg.
- 1957 Scottish Cables (S.A.) Ltd., Box/Bus 2882, Johannesburg.
- 1961 Simon Lodge (Pty.) Ltd., Box/Bus 9599, Johannesburg.
(name changed).
- 1960 Siemens S.A. (Pty.) Ltd., Box/Bus 4583, Johannesburg.
- 1957 Standard Telephones & Cables Ltd., Box/Bus 286, Boksburg.
- 1957 Stone-Stamcor (Pty.) Ltd., Box/Bus 31522, Braamfontein, Tvl.
- 1957 S.A. General Electric Co. Ltd., Box/Bus 1905, Johannesburg.
- 1957 Superconcrete Pices (Pty.) Ltd., Box/Bus 92, Roodepoort, Tvl.
- 1957 Switchcraft (Pty.) Ltd., Box/Bus 6444, Johannesburg.
- 1960 South Wales Electric (Pty.) Ltd., Box/Bus 426, Kempton Park.
- 1965 South Wales Electric Rhodesia (Pvt.) Ltd., Box/Bus 343, Salisbury.
- 1957 Southern African Cable Makers' Association, Box/Bus 2258, Johannesburg.
- 1967 S.A. National Committee on Illumination, Box/Bus 395, Pretoria.
- 1960 Thorn Lighting S.A. (Pty.) Ltd., Box/Bus 43075, Industria.
- 1969 Wardle & Simpson, 2nd Floor, South West House, Main Street, Port Elizabeth.
- 1965 G. D. Wichahn, Box/Bus 664, Bethlehem.
- 1957 Wilson & Herd (Pty.) Ltd., Box/Bus 3093, Johannesburg.
- 1957 Yarrow Africa (Pty.) Ltd., Box/Bus 6918, Johannesburg.
- 1959 Yorkshire Transformers (S.A.) (Pty.) Ltd., Box/Bus 43, Bedfordview.

LIST OF MEMBERS, COUNCIL MEMBERS AND VISITORS ATTENDING THE 41st CONVENTION OF THE ASSOCIATION OF MUNICIPAL ELECTRICITY UNDERTAKINGS.

LYS VAN LEDE, RAADSLEDE EN BESOEKERS — 41ste KONVENSIË VAN DIE VERENIGING VAN MUNISIPALE ELEKTRISITEITSONDERNEMINGS.

COUNCIL AND ENGINEER MEMBERS

(Name of Councillor appears first except where only Engineer attended).

RAAD EN INGENIEUR-LEDE

(Die naam van die Raadslid verskyn eerste, behalwe waar slegs die Ingenieur die vergadering bygewoon het).

ALIWAL NORTH : T. Greyvenstein, G. H. Jantzen.	EDENVALE : J. P. Bezuidenhout, J. J. Barrie.	LADYSMITH : J. J. Roos. F. Stevens.
BRAKPAN : J. M. Vining, H. Barnard.	ESTCOURT : J. Gilby, J. G. F. Erickson.	LYDENBURG : E. Trautman.
BENONI : W. F. Pienaar, D. Lees.	FORT BEAUFORT : D. R. Verschoor.	NEWCASTLE : P. H. Ryley, J. S. Craig.
BETHAL : M. N. Kirberger.	GERMISTON : H. Boneschans, C. Lombard.	NELSPRUIT : D. P. du Plooy.
BRITS : J. C. Bodenstein, J. van S. Lochner.	GEORGE : A. A. du Toit.	ORKNEY : Chr. Clidaras, P. du Toit.
BOKSBURG : J. H. A. Roets, A. H. L. Fortman.	HEIDELBERG : H. O. Ostro, W. J. B. van Heerden.	PARYS : D. R. Pretorius.
BLOEMFONTEIN : R. Greyling, E. E. de Villiers.	JOHANNESBURG : Max Neppe, R. Leishman.	PRETORIA : A. P. Denyschen, E. A. McWilliam.
BULAWAYO : J. N. Jones.	KLERKSDORP : T. J. Randles, J. M. Gericke.	PERI URBAN AREAS HEALTH BOARD : W. A. Cronjé.
CAPE TOWN : Chr. Tyers, A. C. T. Frantz.	KEMPTON PARK : M. J. Crouse, L. Futcher.	PIETERSBURG : J. J. Hugo, J. J. Inglis.
CARLETONVILLE : P. J. K. van Vuuren, J. van der Walt.	KEETMANSHOOP : K. U. Psotta.	PIETERMARITZBURG : W. J. A. Gilson, J. C. Waddy.
DE AAR : S. Immanuel, C. P. du Plessis.	KIMBERLEY : A. J. Loubser, R. W. Muir.	PORT ELIZABETH : H. Brewer R. S. Dunstan.
DEWETSDORP : O. J. Fourie, A. Hatwich.	KROONSTAD : M. Keevey, W. Rossler.	POSTMASBURG : W. J. Dauth.
DURBAN : A. D. Adams, R. M. O. Simpson.	KRUGERSDORP : J. E. du Plessis, A. J. van den Berg.	POTCHEFSTROOM : Chr. de Kock, E. de -C. Pretorius.
EAST LONDON : H. G. Kipling, K. G. Robson.	MAFEKING : E. J. te Brugge, A. Bloem.	POTGIETERSRUS : O. van Rooyen, G. A. Lotter.
EMPANGENTI : R. A. Paull.	MESSINA : P. M. Jooste.	PORT ALFRED : M. J. C. Kruger.
ERMELO : E. G. Buchanan.	MOSSEL BAY : H. G. Herbst, F. W. Phillips.	QUEENSTOWN : E. F. Mattuschek, V. E. O. Barratt.
	MOOI RIVER : R. V. Bailey.	RANDFONTEIN : J. M. Griffiths, J. R. Cherry.

ROODEPOORT :	F. J. van der Merwe.	VRYBURG :	C. H. Kotze, P. J. R. Pretorius.
H. J. Hugo, P. J. Botes.	SOMERSET WEST :		
RUSTENBURG :	TZANEEN :	VRYHEID :	M. C. Slabbert, H. J. Botha.
P. A. Meintjies,	T. J. Millen.		
STRAND :	THABAZIMBI :	WARMBAD :	P. L. Vergottini.
W. P. Rattey.	M. H. Kerchner.		
STANDERTON :	UMTALI :	WELKOM :	J. Munro, R. W. Barton
J. P. Colling, Clr. A. J. Nel.	J. Kircos, H. T. Turner.		
SALISBURY :	UMTATA :	WESTONARIA :	S. J. Hofmeyer, L. Dreyer.
W. M. Steer, E. C. Lynch.	D. F. Thompson, B. F. Carpenter.		
SASOLBURG :	UITENHAGE :	WITBANK :	M. van N. Roode, D. S. van der Merwe.
R. J. Pienaar, J. C. Strauss.	E. S. Rens, J. D. Dawson.		
SPRINGS :	VANDEBUIJLPARK :	WINDHOEK :	E. G. E. Kaschek, L. Lewis.
M. P. Kotze, Mrs. A. J. E. Jurgens, J. K. von Ahlften.	L. Jamneck, G. C. Theron.		
STELLENBOSCH :	VIRGINIA :	WORCESTER :	Dr. G. Watermeyer, W. Theron.
J. F. Lategan.	I. P. Olivier, I. F. Hobbs.		
STILFONTEIN :	VEREENIGING :		
Clr. F. D. Stemmet, Clr. J. P. D. Theunissen, Clr. C. J. Swanepoel.	R. W. Oliver, A. F. Turnbull.		

AFFILIATES/GEAFFILEERDES :

Organisation/Organisasie :	Name/Naam :	Town/Stad :
Adams, Ripley & Dürr	K. A. H. Adams	Johannesburg
Alcan Aluminium of S.A. Ltd.	R. R. Robinson	Johannesburg
Amalgamated Power Engineering S.A. (Pty.) Ltd.,	A. H. W. Hugo	
Aberdare Cables Africa Ltd.	A. H. Laird	Johannesburg
A.E.G. South Africa (Pty.) Ltd.	J. C. Sutherland	
A.S.E.A. Electric S.A. Ltd.	G. H. van Harten	Johannesburg
Arthur, Trevor Williams (Pty.) Limited	D. R. Koener	Johannesburg
Aycliffe Cables Ltd.	N. G. Leech	Johannesburg
African Lighting Industries	J. W. Linley	
African Cables Limited	J. T. Williams	Johannesburg
British Insulated Callender's Cables S.A. Ltd.	J. A. Barnett	
Chloride Electrical Storage Co. S.A. (Pty.) Ltd.	C. A. Rist	Johannesburg
Clinkscapes, Maughan-Brown and Partners	J. Duffield	Johannesburg
B.G.E.C.	D. A. W. Holt	Johannesburg
Cullinan Refractories Ltd.	N. R. Price	Johannesburg
Davidson & Co. (Africa) (Pty.) Ltd.	N. E. Fisher	
	N. D. Jones	Johannesburg
	W. D. S. Clinkscapes	Port Elizabeth
	J. H. Hayes	Salisbury
	A. H. Cartledge	Olifantsfontein
	B. Wiles	
	G. R. Parker	Springs

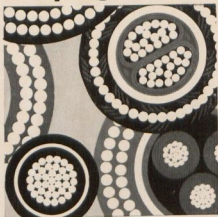
	Name/Naam :	Town/Stad :
Electrical Contractors Association (S.A.)	M. B. Gilbert	Johannesburg
English Electric Co. (C.A.) (Pvt.) Ltd.	H. Prins	Salisbury
Electrical Protection Co. (Pty.) Ltd.	P. B. Price	Benoni
Eberhardt-Martin (Pty.) Ltd.	H. P. Smith	Johannesburg
Farad (Pty.) Ltd.	E. B. Martin	Johannesburg
Fuch's Electrical Industries (Pty.) Ltd.	G. Gerber	Alberton
Florescent Lighting Corporation S.A. (Pty.) Ltd.	G. R. Hain	Johannesburg
G.E.C.—A.E.I. South Africa (Pty.) Ltd.	R. W. Wood	Johannesburg
Heineman Electric (S.A.) Ltd.	D. H. Pieksma	Salisbury
Hopkinsons S.A. (Pty.) Ltd.	T. E. Wilkinson	Salisbury
Marthinusen, Harold & Co. (Pty.) Ltd.	J. H. Hayes	Johannesburg
Merz & McLellan	E. Tarchalski	Johannesburg
Oerlikon S.A. (Pty.) Ltd.	D. Adams	Johannesburg
Reunert & Lenz Ltd.	A. D. Sayers	Johannesburg
A. Reyrolle & Co. (Rhodesia) Ltd.	R. Goddard	Johannesburg
A. Reyrolle & Co. (S.A.) (Pty.) Ltd.	C. Roeske	Johannesburg
S.A. General Electric Co.	C. N. Gaunt	Johannesburg
Siemens (S.A.) (Pty.) Ltd.	C. E. R. Langford	Johannesburg
Simplex Electric of S.A. (Pty.) Ltd.	C. E. Weber	Johannesburg
Scottish Cables (S.A.) Ltd.	A. A. Douglas	Salisbury
South Wales Electric (Pty.) Limited	J. C. Pattison	Elandsfontein
Superconcrete Pipes (Pty.) Ltd.	T. C. March	Johannesburg
Wardle & Simpson	M. R. C. Strickland	Johannesburg
	C. R. J. Pilcher	Johannesburg
	N. Kirchner	Johannesburg
	J. G. Douglas	Johannesburg
	T. S. Harper	Johannesburg
	A. Biehler	Johannesburg
	Dr. D. F. W. Meyer-Witting	Johannesburg
	J. A. Morrison	Johannesburg
	A. C. Grant	Johannesburg
	D. G. Sutherland	Johannesburg
	I. J. Woods	Johannesburg
	H. Seabrooke	Roodepoort
	A. J. S. Kruger	Port Elizabeth
	E. Bussell	
	A. C. Simpson	

VISITORS/BESOEKERS

Name/Naam :	Organisation/Organisasie :	Town/Stad :
Anderson, R. B.	C.S.I.R. (National Research Institute for Math. Sciences/W.N.N.R.)	Pretoria.
Baxter, J. D. C.	Northern Cape Regional Electrification Board.	Kimberley
Bayley, V. H.	Municipality Umtali/Munisipaliteit.	Umtali.
Baillie, T. H.	Dept. of Public Works/Dept. van Openbare Werke.	Pretoria.
Bassett, J. K.	Director AAD.	Umtali
Bloomfield, L.	Asst. Town Clerk.	Umtali
Butchard, D. B.	Rhodesia ESC.	Umtali
Cormack, Prof. W.	Witwatersrand University/Universiteit van Witwatersrand.	Johannesburg.

Name/Naam :		Town/Stad :
Cutler, P. V.	South African Diplomatic Mission/Suid-Afrikaanse Diplomatieke Sending.	Salisbury.
Dunlop, Brig. the Hon. A.	Minister of Transport & Power/Krygstuigraad.	Salisbury.
Eggars, A. F. W. H.	Posts & Telegraphs/Pos en Telegraafwese.	Pretoria.
Esteves, J. J. L.	S.M.A.E.	Lourenco Marques.
Froggatt, W. A.	Rhodesian Institute of Engineering Manicaland Area.	Umtali
Fothergill, E. R. B.	E.S.C.O.M. (Rhodesia)/Elektrisiteitsvoorsiening- kommissie (Rhodesië).	Salisbury.
Gledhill, Mrs. E. M.	Umtali Municipality/Umtali Munisipaliteit.	Umtali
Giles, P. A.	Past President.	Pretoria.
Gilmour, A. L.	E.S.C.O.M. (Rhodesia)/Elektrisiteitsvoorsiening- kommissie (Rhodesië).	Salisbury.
Glover, B. S.	Umtali Town Treasurer.	Umtali.
Gosling, A. J. G.	S.A. Railways/S.A. Spoorweë.	Johannesburg.
Greyling, R.	U.M.E.	Bloemfontein.
Hamlin, J. H.	Rhodesia E.S.C.	Salisbury.
Hayes, M. E.	Provincial Commissioner Manicaland.	
Hooley, L. J.	Ministry of Transport & Power/Krygstuigraad.	Salisbury.
Howman, E. H.	Chairman Rhodesia E.S.C.	Umtali.
Irvine, D. R.	Rhodesia E.S.C.	Salisbury.
Jeffs, F.	Finance Committee.	Umtali.
Jooste, R. K.	S.A.B.S./S.A.B.S.	Pretoria.
Laidler, R.	Department of Works.	Causeway.
Levy, G. S.	Umtali Municipal Council.	Umtali.
Martin, F.	Asst. Town Engineer.	Umtali.
McDowell, J.	Chairman Town & Lands.	Umtali
Martin, H. R.	Salisbury Municipality/Salisbury Munisipaliteit.	Salisbury.
Middlecote, A. A.	S.A.B.S. and also S.A. Institute of Electrical Engineers	Pretoria.
Murray, J. S.	Mayor of Umtali.	Umtali
Odendaal, D. F.	Institute of Certified Mechanical & Electrical Engi- neers/Die Instituut van Gediplomeerde Werktuig- kundige en Elektrotegniese Ingenieurs.	Johannesburg.
Parkinson, G. H.	E.S.C.O.M. (Rhodesia).	Salisbury.
Price, E. T.	E.S.C.O.M.	Johannesburg.
Pilbrough, D. J.	Standards Assoc. of Central Africa.	Salisbury.
Reed, J.	Councillor.	Umtali.
Richardson, J. G.	Swaziland Electricity Board.	Umtali.
Smart, W.	Deputy Mayor.	Mbabane.
Smith, Jan. H.	E.S.C.O.M./Elektrisiteitsvoorsieningskommissie.	Umtali.
Stacey, N. B.	Asst. Treasurer.	Johannesburg.
Stevenson, T.	Councillor.	Umtali.
Tubb, B. H. J.	Former City Electrical Engineer, Salisbury.	Umtali.
Tyrell, J.	Stores Controller.	Salisbury.
van Wyk, J. D. N.	C.S.I.R. (Nat. Research for Maths. Science)/W.N.N.R.	Umtali.
Wannenburg, J. C.	Dept. of Labour/Dept. van Arbeid.	Pretoria.
Wetmore, C. N.	Ministry of Transport & Power.	Pretoria.
Williams, A. V.	_____	Salisbury.
		Kimberly.

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Electric cables—sinews of industry—carrying power and progress to every corner of our land. Whatever the cable, big or small, high-tension or otherwise, African Cables Limited have the means and know-how to manufacture to the highest international standards. Every product leaving our Vereeniging factory is backed by the unequalled technical resources of the Cable Makers Association of Britain—an organisation which spends over R2,000,000 a year on research and development.

CERTIFICATION



MARK
Regd. Trade Mark

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- Enfield Cables (South Africa) (Pty.) Ltd.
- GEC-AEI of South Africa (Pty.) Ltd.
- Hadzcolec (Pty.) Ltd.
- Johnson & Phillips Cables (S.A.) (Pty.) Ltd.
- Siemens (Pty.) Ltd.
- Wilson & Herd (Pty.) Ltd.
- Hawker Siddeley Electric Africa Ltd.

African Cables Limited

LFE 174

Name/Naam :		Town/Stad :
Williams B. A.	E.S.C.O.M. (Rhodesia).	Salisbury.
His Worship the Mayor and Mayoress		Umtali.
Name/Naam :	OTHER MEMBERS/ANDER LEDE	Town/Stad
Burton, C. R.	(Associate Member/Geassosieerde-lid)	Kimberley
Conradie, D. J. R.	(Associate Member/Geassosieerde-lid)	Bloemfontein
Downey, J. C.	(Honorary Member/Ere-lid)	Springs
McGibbon, J.	(Associate Member/Geassosieerde-lid)	Carletonville
McGowan, J. M.	(Associate Member/Geassosieerde-lid)	Salisbury
Muller, H. M. S.	(Associate Member/Geassosieerde-lid)	Upington
Sibson, A. R.	(Honorary Member/Ere-lid)	Bulawayo
Williams, T. J.	(Associate Member/Geassosieerde-lid)	Pretoria

Name/Naam :	A.M.E.U. OFFICIALS/A.M.E.U. OFFISIEELE	Town/Stad
Burke, J. C.	(A.M.E.U. Local Organisation)	Umtali
Bradfield, Mrs. J.	(Representing the Secretaries/Verteenwoordiger van die Sekretariat)	East London/Oos-Londen
Brewin, Miss E.	(Representing the Secretaries/Verteenwoordiger van die Sekretariat)	Johannesburg
Botha, W. J.	(Sonex—Sound Engineering/Sonex—Klank Tegniek)	East London/Oos-Londen
Conradie, P. J.	(Official Translator/Amptelike Vertaler)	Vanderbijlpark
Ewing, R. G.	(Representing the Secretaries/Verteenwoordiger van die Sekretariat)	East London/Oos-Londen
Hill, Mrs. E.	(Travel—Musgrove & Watson/ Reis—Musgrove & Watson)	East London/Oos-Londen
Kleb, Mrs. R.	(Sonex—Sound Engineering/Sonex—Klank Tegniek)	East London/Oos-Londen

LADIES/DAMES

(Read Mrs. unless otherwise indicated)		(Lees Mev. behalwe waar ander aangetoon)			
Name/Naam :	Town/Stad :	Name/Naam :	Town/Stad :	Name/Naam :	Town/Stad :
Adams, R. W.	(Somerset West)	Conradie, D. J. R.	(Bloemftn.)	Futcher, L.	(Kempton Park)
Adams, K. A. H.	(Johannesburg)	Cronjé, W. A.	(Pretoria)	Fourie, O. J.	(Dewetsdorp)
Barton, R. W.	(Welkom)	Cormack, W.	(Johannesburg)	Grant, A. C.	(Johannesburg)
Barrie, J. J.	(Edenvale)	Dreyer, L.	(Westonaria)	Gericke, J. M.	(Klerksdorp)
Baxter, J. D. G.	(Kimberley)	Douglas, A. A.	(Johannesburg)	Greyling, R.	(Bloemfontein)
Baillie, T. H.	(Pretoria)	Downey, J. C.	(Springs)	Gilson, W. J. A.	(PMBurg.)
Bailey, R. V.	(Mooi River)	Douglas, J. G.	(Johannesburg)	Griffiths, J. M.	(Randfontein)
Biehler, A.	(Johannesburg)	Duffield, J.	(Industria)	Gilbert, M. B.	(Johannesburg)
Botes, P. J.	(Roodepoort)	Du Plooy, D. P.	(Nelspruit)	Gilmour, A. L.	(Salisbury)
Boneschans, H.	(Germiston)	Du Toit, A. A.	(George)	Gosling, A. J.	(Johannesburg)
Bodenstein, J. C.	(Brits)	Dunstan, R. S.	(Port Elizabeth)	Hain, G. R.	(Johannesburg)
Burton, C. R.	(Kimberley)	Eggers, A. F. W. H.	(Pretoria)	Harper, T. S.	(Johannesburg)
Bayle, O. H.	(Umtali)	Erickson, J. G. F.	(Estcourt)	Herbst, H. G.	(Mossel Bay)
Burke, J. C.	(Umtali)	Ewing, R. G.	(East London)	Hofmeyer, S. J.	(Westonaria)
Bezuidenhout, J. P.	(Edenvale)	Frantz, A. C. T.	(Cape Town)	Hoooley, L. H.	(Pretoria)
Craig, J. S.	(Newcastle)	Frankle, M.	(Johannesburg)	Hugo, J. J.	(Pietersburg)
Clinkscales, W. D. S.	(P.E.)	Froggat, W. A.	(Salisbury)	Hugo, H. J.	(Roodepoort)
Clidas, Mrs.	(Orkney)	Fortman, A. H. L.	(Boksburg)	Holt, D. A. W.	(Vereeniging)
Cherry, J. R.	(Randfontein)			Hugo, A. W.	(Johannesburg)

Inglis, J. J. (Pietersburg)
 Jamneck, L. (Vanderbijlpark)
 Jones, J. N. (Bulawayo)
 Jones, N. D. (Bramley)
 Keevey, M. (Kroonstad)
 Kerberger, M. N. (Bethal)
 Kipling, H. G. (East London)
 Kotze, M. P. (Springs)
 Kruger, M. J. C. (Port Alfred)
 Kirschner, N. (Elandsfontein)
 Kircos, J. (Umtali)
 Langford, C. E. R. (Jhburg)
 Lategan, J. F. (Stellenbosch)
 Lees, D. (Benoni)
 Leishman, R. (Johannesburg)
 Loubser, A. J. (Kimberley)
 Lombard, C. (Germiston)
 Lotter, G. A. (Potgietersrus)
 Lochner, J. van S. (Brits)
 Laird, A. H. (Johannesburg)
 Martin, E. B. (Roosevelt Park)
 March, T. C. (Johannesburg)
 McWilliam, E. A. (Pretoria)
 McGowan, J. M. (Salisbury)
 McGibbon, J. (Carletonville)
 Mattuschek, E. F. (Queenstown)
 Meintjies, P. A. (Rustenburg)
 Millen, T. J. (Tzaneen)
 Morrison, J. A. (Johannesburg)

Muller, H. M. S. (Upington)
 Meyer-Witting, D. F. (JHburg)
 Murray, J. S. (Umtali)
 Odendaal, D. F. (Johannesburg)
 Ostro, H. (Heidelberg)
 Paull, R. A. (Empangeni)
 Parker, G. R. (Springs)
 Pattison, J. C. (Johannesburg)
 Pretorius, D. R. (Parys)
 Price, E. T. (Johannesburg)
 Prins, H. (Johannesburg)
 Pienaar, W. F. (Benoni)
 Pilcher, C. R. J. (Salisbury)
 Phillips, F. W. (Mossel Bay)
 Rattey, W. P. (Strand)
 Rens, E. S. (Uitenhage)
 Randles, T. J. (Klerksdorp)
 Richardson, J. G. (Swaziland)
 Roode, M. van N. (Witbank)
 Roets, J. H. A. (Boksburg)
 Rossler, W. (Kroonstad)
 Robinson, R. R. (Johannesburg)
 Rist, C. A. (Johannesburg)
 Swanepoel, C. J. (Stilfontein)
 Sayers, A. D. (Johannesburg)
 Stevens, F. (Ladysmith)
 Stemmet, F. D. (Stilfontein)
 Steer, W. M. (Salisbury)
 Simpson, R. M. C. (Durban)

Smith, Jan H. (Johannesburg)
 Smith, H. P. (Benoni)
 Strickland, M. R. C. (Salisbury)
 Sutherland, J. C. (Johannesburg)
 Sutherland, D. C. (Johannesburg)
 Trautman, E. (Lyndenpark)
 Theron, G. C. (Vanderbijlpark)
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 Theron, W. (Worcester)
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 van Harten, G. H. (JHburg)
 van Vuuren, P. J. (Carletonville)
 van Wyk, A. A. (Meyerton)
 v d Merwe, D. S. (Witbank)
 v d Merwe, Mrs. (Stilfontein)
 Vergottini, P. L. (Warmbad)
 Verschoor, D. R. (Ft. Beaufort)
 von Ahlften, J. K. (Springs)
 v d Walt, (Carletonville)
 Waddy, J. C. (PMBurg)
 Weber, C. E. (Johannesburg)
 Williams J. T. (Johannesburg)
 Williams, A. V. (Kimberley)
 Williams, J. T. (Pretoria)
 Wood, R. W. (Alberton)
 Woods, I. J. (Johannesburg)
 Williams, B. A. (Salisbury)

APOLOGIES

COUNCIL AND ENGINEER MEMBERS

Municipality of Alberton.
 Village Council of Bedfordview.
 Municipality of Barberton.
 Town Board of Eshowe.
 Municipality of Fort Victoria.
 Municipality of Gwelo.
 Municipality of Graaff-Reinet.
 Municipality of Harrismith.
 Municipality of Kokstad.
 Municipality of Kenhardt.
 Municipality of Middelburg.
 Municipality of Matatiele.
 Municipality of Nigel.
 Municipality of Odendaalsrus.
 Municipality of Oudtshoorn.
 Borough of Port Shepstone.
 Municipality of Piet Retief.
 Municipality of Robertson.
 Municipality of Riversdale.

HONORARY MEMBERS

J. E. Mitchell.
 W. H. Milton.
 W. Beesley.

VERSKONINGS

RADE- EN INGENIEURSLEDE

Alberton Munisipaliteit.
 Bedfordview Stadsraad.
 Barberton Munisipaliteit.
 Eshowe Stadsraad.
 Fort Victoria Munisipaliteit.
 Gwelo Munisipaliteit.
 Graaff-Reinet Munisipaliteit.
 Harrismith Munisipaliteit.
 Kokstad Munisipaliteit.
 Kenhardt Munisipaliteit.
 Middelburg Munisipaliteit.
 Matatiele Munisipaliteit.
 Nigel Munisipaliteit.
 Odendaalsrus Munisipaliteit.
 Oudtshoorn Munisipaliteit.
 Port Shepstone Munisipaliteit.
 Piet Retief Munisipaliteit.
 Robertson Munisipaliteit.
 Riversdale Munisipaliteit.

ERE-LEDE

J. E. Mitchell.
 W. H. Milton.
 W. Beesley.

AFFILIATES

Transvaal Coal Owners Assoc.—Johannesburg.
C.A. Parsons & Co. (S.A.) (Pty.) Ltd.—Johannesburg.
Yarrow (Africa) (Pty.) Ltd.—Johannesburg.
Standard Telephones & Cables (S.A.) (Pty.) Ltd.—
Boksburg.
First Electric Corporation of S.A. Ltd.—Knights, Tvl.
Ballenden & Robb.—Johannesburg.
R. T. Jones.—Braamfontein.
Rice & Diethelm Ltd.—Johannesburg.
Central African Power Corp.—Salisbury.

VISITORS

Electricity Control Board—Pretoria.
Provincial Secretary, Orange Free State Province.
Secretary, Department of Community Development—
Pretoria.
G. R. Bossoli, University of Witwatersrand.—Jhb.
Chief Engineer, Department of Posts & Telegraphs.
Department of Commerce.
Provincial Administration of the Cape of Good Hope.
Natal Provincial Administration.

OTHERS

E. L. Smith.
D. J. Hugo.
D. Murray-Nobbs.
W. P. Ford.
J. Wilson.

GEAFFILEERDES

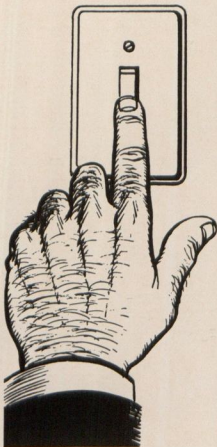
Transvaal Coal Owners Assoc.—Johannesburg.
C.A. Parsons & Kie (S.A.) (Edms.) Bpk.—Johannesburg
Yarrow (Afrika) (Edms.) Bpk.—Johannesburg.
Standard Telephones & Cables (S.A.) (Edms.) Bpk.—
Johannesburg.
First Electric Coporation van S.A. Bpk.—Knights, Tvl.
Ballenden & Robb.—Johannesburg.
R. T. Jones—Braamfontein.
Rice & Diethelm Bpk.—Johannesburg.
Central African Power Corp.—Salisbury.

BESOEKERS

Elektrisiteitsbeheerraad—Pretoria.
Provinsiale Sekretaris, Provinsie Oranje-Vrystaat.
Sekretaris, Departement van Gemeenskapsbou—
Pretoria.
G. R. Bossoli, Witwatersrand Universiteit—Jhb.
Hoof Ingenieur, Departement van Pos-en-Telegraaf-
wese.
Departement van Handel.
Provinsiale Administrasie van die Kaap van die Goeie
Hoop.
Natalse Provinsiale Administrasie.

ANDERE

E. L. Smith.
D. J. Hugo.
D. Murray-Nobbs.
W. P. Ford.
J. Wilson.



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Power, light, heat, cooling - all conjured up at the touch of a switch. That is ESCOM.

ESCOM produces more than half of all the electricity generated on the Continent of Africa . . .

powers the Republic's thriving industries . . . takes electricity to over 200,000 square miles

and reaches out to an additional thousand farms every year.

ESCOM is at the heart of the Republic's civilisation, modernity, progress. It is in the home of the South African and at his place of work - helping to make life better and more comfortable, work easier and more efficient. ESCOM electricity is among the cheapest available anywhere in the world.

The growth of ESCOM reflects the economic growth of the Republic. Forecasts of future demand point to continued development at the high rate of the past decade.

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ESCOM

SERVES THE PRESENT — PLANS FOR THE FUTURE

PMB/102/7E

The Forty-first Convention of the Association was opened in the Queen's Hall, Umtali, on Monday, 16th June, 1969. Sessions of the Convention were held in the Courtauld Theatre. Attendance at the Convention was as follows:—76 Councils, represented by 57 Councillors and 76 Engineers and Associates; 2 Honorary Members (not representing Councils or Affiliates); 6 Associate Members; 60 Representatives of 39 Affiliates; 50 Visitors (representing Government Departments, Public Utilities and other organisations); 143 Ladies; 8 A.M.E.U. Officials — a total of 402 persons.

FIRST DAY

OPENING SESSION

The President, Mr. G. C. Theron, greeted those at the Convention and called upon the Rev. Michael Rowe to lead those present in prayer.

Mr. Theron then extended a welcome to all present as follows:

Dames en here, u teewoordigheid in sulke groot getalle by die 41ste Konvensie van die Vereniging word hoog op prys gestel en nou dat ek die skoonheid van die Hoogdande van Rhodesië gesmaak het is dit vir my onverklaarbaar dat ons nie die ander veertig Konvensies ook in Umtali kom hou het nie! Mr. May-

His Worship the Mayor of Umtali, Councillor J. S. Murray, conveyed a sincere welcome to all attending the Convention.

The President next introduced Brigadier the Honourable Andrew Dunlop, Minister of Transport and Power, who, in formally opening the Convention, addressed those present as follows:

Mr. President, Your Worship the Mayor, ladies and gentlemen, I'd like just to say thank you for those kind words; it's a great joy for me to be here today.

Now you had, I know, expected the Prime Minister to open this Convention but unfortunately, owing to the great weight of his commitments during this referendum campaign, he's unable to do so. This he deeply regrets, and he has asked me to convey his apologies to you for his unavoidable absence. So, ladies and gentlemen, I'll ask you to bear with me, as

Die Een-en-Veerstigste Konvensie van die Vereniging is op Maandag, 16 Junie 1969, in die Queen's-saal, Umtali, geopen. Die sittings van die Konvensie het in die Courtauld-teatre plaasgevind. Die Konvensie is deur die volgende persone bygewoon:—76 Stadsrade, verteenwoordig deur 57 Raadslede en 76 Ingenieurs en Geassosieerdes; 2 Erelede (wat nie Rade of Geaffilieerde verteenwoordig nie); 6 Geassosieerde lede; 60 Verteenwoordigers van 39 Geaffilieerdes; 50 Besoekers (wat Regeringsdepartemente, Openbare Nutsmaatskappye en ander organisasies verteenwoordig); 143 Dames en 8 V.M.E.O.-beamptes — altesaam 402 persone.

EERSTE DAG

OPENINGSSITTING

DIE PRESIDENT, Mnr. G. C. Theron, groet almal by die Konvensie en versoek Eerw. Rowe om voor te gaan in gebed.

Vervolgens heet Mnr. Theron die aanwesiges soos volg welkom:

or, the beauty of your city has for many years been reflected at our conventions through the warm-heartedness and friendliness of your delegates, so that we already feel at home in Umtali. Your personal touch in addressing us will make us part of this very happy family.

Sy Agbare die Burgemeester van Umtali, Raadlid J. S. Murray, spreek 'n woord hartlike verwelkoming tot almal wat die Konvensie bywoon.

Hierop stel die President Sy Edele Brigadier Andrew Dunlop, Minister van Vervoer en Krag, aan die aanwesiges voor. Brigadier Dunlop lewer sy formele openingsrede soos volg:

his substitute, on this important occasion.

Now I believe this occasion to be important on two counts:

Firstly: because it is the 41st Convention since the foundation of your Association in 1915. That such an Association should survive the vicissitudes of the past 54 years without materially altering the basic concepts of its founders, is in itself a singularly meritorious achievement, particularly when one considers these highly pressurized times in which we live: and

when it seems that change is so often urged merely for the sake of change.

Further, that your Association is able to organize a well-supported Convention on this scale so far away from the home towns of most members, is the measure of its competence and hence its success. May it so continue, and may it grow from strength to strength. I would say that in its own non-political way it serves a most useful comity of neighbouring nations where there is a friendly recognition of each other's electricity problems and whereby, through the medium of conventions such as this, an invaluable forum is provided for mutual discussion of these problems, and for the exchange of ideas.

Of **secondary** importance, perhaps, but none the less a matter of satisfaction to us in Rhodesia (which His Worship the Mayor has just mentioned), is the selection for, I believe, the fourth time in your history, of a Rhodesian town as your venue: and furthermore, on this important occasion, its Electrical Engineer as your President-elect. I feel sure that in both you've made a wise choice.

Ladies and gentlemen, the ministerial portfolios which I hold entitle me to wear a number of hats: these are variously labelled: Roads and Road Traffic, Railways, Airways and, last but by no means least, **POWER**. Today I'm proud to be wearing my "Power Hat" and I must admit it has caused me little discomfort since I first donned it in January 1966. This clearly is because I'm blessed with a competent, dedicated and loyal staff in my Ministry, a highly efficient Electricity Supply Commission whose efficiency is immeasurably strengthened by its quite outstanding teamwork (and I would emphasize that word, **teamwork**) which permeates from all ranks—from Members of the Board to the most newly-joined technician: also a Central African Power Corporation who under, as you can imagine, ladies and gentlemen, considerable difficulties, (on which I'll not enlarge) do yeoman's service in the production of power for both Rhodesia and Zambia. Consequently, Rhodesia is fortunate indeed in having a particularly healthy and fast-developing Electricity Supply Industry which is fully self-supporting, without need of Government handouts or subsidies; and where, contrary to world trends, tariffs have not been increased for years. The main reason for such tariff stability is that Stage 1 of Kariba Hydro-electric Project has been in operation for nine years. During that period the controlling authority, now the Central African Power Corporation, after providing out of its revenues from power sales for all finance charges on Kariba and for half the cost of future development, plus the reimbursement of all capital and running costs for the intercommunicated thermal power stations, has supplied power in bulk to the distributing undertakings at a steadily reducing price. This has fallen in Rhodesia

from an average price of 0.784 pence/unit to 0.601 pence; and in Zambia, from 0.777 pence to 0.619 pence.

For about half the capital costs of Stage 1 the Kariba Scheme can be brought to its planned full maturity, doubling the present level of output and greatly extending the transmission system in both countries. This development is now under active consideration and it is intended to be commissioned by 1974. It is a matter of fact, that for every year such works are deferred, half the operational costs (or the operational contents is a better way to describe it) of the mighty Lake Kariba have to be discharged to waste down-river, representing the equivalent of some £10,000,000 worth of electricity per annum.

However, from what I've just said I think it would be appreciated that the completion of the Kariba project to its full potential, is an economic and mutual necessity neither country can afford to ignore. Pending such development, which includes the construction of a hydro-power station on the north bank similar in capacity to the existing south bank station, (now running nearly at full load), the ever-increasing demand on the system will be met by Kariba and the already intercommunicated thermal power stations; plus the proposed interconnection of the extended Victoria Falls Hydro-power Station, and the first stage of the Kafue Scheme.

With regard to the distribution of electricity in Rhodesia and notwithstanding its present healthy state, I'm not complacent and look forward to change: not, (let me hasten to emphasize what I said earlier in another context) for the sake of change, but for the purpose of serving better both the overall national interest and the interest of the consumer—who, after all, fits the bill primarily as a tariff-paying consumer and not as a taxpayer or ratepayer.

Here I do not wish to rush in where angels fear to tread and where delegates at this Convention probably also have not the opportunity to "charge in". So I will not anticipate the debate which is to be initiated by Mr. Irvine, the Chief Commercial Engineer of the Electricity Supply Commission, when he reviews "Progress and Future Trends" in his paper tomorrow; and, subsequently, on Wednesday the debate which will arise after Mr. Rowan Martin, Treasurer of the City of Salisbury, has presented his paper on "Financial Autonomy for Electricity Undertakings"—although, if I may say so, he is prudent enough to say that he is campaigning for financial and not executive independence from local government control!

I am sure that all the pros and cons of change in the pattern of electricity distribution will be exhaustively debated and that some sound conclusions will be reached. Meanwhile, you will forgive me if from my privileged and, I hope, somewhat unassailable position on this platform, I support the advocates

of change in this particular regard and in this particular context.

As I see it, the Rhodesian organizational structure for electricity distribution, which traditionally falls under two separate ministerial portfolios and is split down the middle by having two principal Acts that are by no means compatible, is long overdue. Further, there is, I think, a case for much closer collaboration between the existing semi-independent undertakings; and I believe there are many benefits to be gained, for example, from voluntary amalgamation in order to pool common resources and in relation to bulk power purchases from the national grid; to exploit dissimilar diversity and load factors.

I also believe that there would be an advantage in having a common financial structure and unified accounting procedures. These could lead to national uniformity in electricity tariffing, for that is, in fact, a standard commodity produced from a common source. Also to the self-generation of capital requiring a high proportion of profits to be ploughed back into the electricity supply business: again I consider mutual benefits could be derived from a central multi-purpose computer installation for administrative, accounting and engineering purposes, on a scale beyond the reach of separate undertakings; and from a centralized tendering, purchasing and stocking procedure for standard items of plant and equipment.

I am quite sure that many other benefits stemming from a voluntary amalgamation of electricity un-

The President thanked Brigadier Dunlop and continued :

Ladies and gentlemen, before introducing to you another Rhodesian, I ask you to allow me a few minutes to review the past two years. I thank you, gentlemen for electing me as your President two years ago at that historic Convention in Lourenco Marques, and for the Executive Council which you gave me to support me all the way—without their understanding and guidance the two years would have been wasted.

Die ingenieur is maar die vertoonwoordiger van sy dorp en die eer van 'n presidentskap die afgelope twee jaar kom Vanderbijlpark toe. Aan die Stadsraad en die belastingbetalers van Vanderbijlpark sê ek: "Baie dankie dat u dit vir my moontlik gemaak het". Maar ook 'n woordjie van dank aan my vriend, Raadslid Louis Jamneck, wat my so wonderlik bygestaan het met raad en daad op die lang paadjie wat ons geloop het vir die afgelope sewe jaar toe ons vir die eerste keer op Oos-Londen gholf gespeel het.

The President may be the head of the organisation (for the last two years just probably just a figure-

head) but the Secretary is the heart which keeps the organisation ticking. Hearts may be transplanted, but in practice the patient does not seem to survive very long! Mr. Dick Ewing and his staff offered me their support and co-operation four years ago and this I always received in abundance. Many thanks, Dick and Elaine.

dertakings will be stressed during the debate by those more qualified than I, particularly in regard to the pooling of invaluable human resources to serve national rather than local interests. For it cannot be disregarded that there is a growing shortage of engineers and technicians in Southern Africa, as indeed there is a universal shortage. Here in Rhodesia there are clear signs of an inadequate intake of junior engineers into the electricity supply industry, aggravated by the lack of an Engineering Faculty at the University. We are faced with the prospect that the intake will be insufficient fairly soon to compensate for retirements and other losses of senior engineers. In such circumstances every available engineer in the industry will have to be employed to his maximum capacity on a national rather than a parochial basis.

However, Mr. President, I've spoken long enough; so I turn to the real purpose for my presence here today. I feel certain that your Executive Council and organizing Secretaries will be amply rewarded for their prodigious efforts in staging and controlling a convention of this magnitude by its proving to be an unqualified success. I hope that all delegates, both those that speak and those that listen, will decide at the end of this meeting that it has been of great value and I trust this Convention at Umtali will be one which inspires, long after its conclusion, pleasant memories in the minds of all those attending.

Mr. President, I now have much pleasure in declaring this 41st Convention open.

Die President bedank Brigadier Dunlop en gaan voort deur to sê:

head) but the Secretary is the heart which keeps the organisation ticking. Hearts may be transplanted, but in practice the patient does not seem to survive very long! Mr. Dick Ewing and his staff offered me their support and co-operation four years ago and this I always received in abundance. Many thanks, Dick and Elaine.

And now I come to that happy moment, which I promised myself two years ago, and that is to hang the Chain of Office, and pleasures, and burdens of the President round the neck of your President-Elect Mr. Harry Turner.

Mr. Turner has been a member of this Association since 1931 and has served on the Executive Council since 1962. His calm and well-considered support was a pillar of strength to me and he never spared himself in organising this Convention to the smallest detail.

For all your hard work and loyalty to the Association, we say "thank you", Harry, and now I ask you to step out and receive the Chain of Office.

Die nuwe President, Mnr. H. T. Turner, spreek sy dank teenoor die Konvensie uit vir die eer wat hom aangedoen is deur hom tot President van die Vereniging te verkies. Hy lewer sy Presidentsrede soos volg:

PRESIDENTIAL ADDRESS, 1969

GENERATION AND DISTRIBUTION OF MUNICIPAL ELECTRICITY IN SOUTHERN AFRICA—THE CHANGING PATTERN—H. T. TURNER—Town Electrical Engineer, Umtali, Rhodesia.

At this point in time, in the history of the Association of Municipal Electricity Undertakings of Southern Africa it would, I think, be opportune to review and reflect on that facet of the electricity supply industry with which members are here today concerned and which was the concept upon which this Association was founded, namely the generation and distribution of electricity by a local authority.

I will confine my address in general to the electricity supply industry here in Rhodesia, but in the knowledge that my comments will find a similar, if not identical parallel, on the wider canvas of the Republic of South Africa.

The overall history of Rhodesia's electrical development has followed a natural and not uncommon pattern coupled with some of the romance associated with the pioneering days of a new country. When Cecil Rhodes was straining every ounce of his dynamic energy to create a great white civilization in Central Africa and trying to find the finance for it, he adopted a method of giving concessions and monopolies to financial houses in return for their assistance. One of these monopolies, so granted, was the sole right to supply water and electric power to this infant and pioneer community of Bulawayo. The Bulawayo Waterworks and Power Company commenced operations in 1897 having to bring every piece of equipment for generators, boilers and distribution by ox-wagon from the rail head at Mafeking over hundreds of miles of roadless veldt and over unbridged rivers. Cattle died in their thousands because rinderpest was sweeping the country. The Concession Company carried on for 30 years and in 1926 the Municipality expropriated and compensated the concessionaires. In 1913 Salisbury commissioned its first municipal power station to be followed by other smaller but no less civically minded and enterprising municipalities in other parts of Rhodesia.

For almost 25 years, to a municipal electrical

The new President, Mr. H. T. Turner, conveyed his appreciation to the Convention for the honour of electing him President of the Association. He delivered his Presidential Address as follows:

PRESIDENTSREDE, 1969

OPWEEKING EN VERSPREIDING VAN ELEKTRISITEIT IN SUIDELIKE AFRIKA—DIE VERANDERENDE PATROON: H. T. TURNER—Elektrotegniese stadsingenieur, Umtali, Rhodesië.

Op hierdie besondere tydskip in die geskiedenis van die Vereniging van Munisipale Elektrisiteitsondernemings in Suidelike Afrika is dit, na my mening, van pas om terug te kyk op en te besin oor daardie fase van die elektrisiteitsvoorsieningswyerheid waarby die lede wat vandag teenwoordig is, belang het en wat die uitgangspunt vir die totstandkoming van hierdie Verenging uitgemaak het, naamlik die opwekking en verspreiding van elektrisiteit deur 'n plaaslike owerheid.

Ek sal my in hierdie rede oor die algemeen bepaal by die elektrisiteitsvoorsieningswyerheid hier in Rhodesië, dog ek doen dit in die wete dat my opmerkings 'n soortgelyke, en moontlik selfs 'n identiese, werklank teen die wyere agtergrond van die Republic van Suid-Afrika sal vind.

Die algemene geskiedenis van Rhodesië se ontwikkeling op die gebied van elektrisiteit het 'n natuurlike en heel gewone patroon gevolg, en was gekoppel aan heelwat van die romantiese wat daar in die pioniersdae van 'n nuwe land te vinde is. Toe Cecil Rhodes besig was om elke greintjie van sy dinamiese energie in te span om 'n groot blanke beskawing in Sentraal-Afrika te vestig en om die nodige fondse vir daardie doel te vind, het hy aan finansiële instellings konsessies en monopolieë toegestaan in ruil vir hul geldelike hulp. Een van die monopolieë wat aldus toegestaan is, was die alleenreg om water en elektriese krag aan die pasgevestigde pioniersgemeenskap van Bulawayo te verskaf. Die Bulawayose Water- en Kragmaatskappy het in 1897 met sy werksaamhede begin, nadat elke stukkie toerusting vir kragopwekkers, stoomketels en verspreiding per ossewa vanaf die spoorgweterminus by Mafeking oor honderde myle van padlose veld en deur onoerbrugte riviere gebring moes word. Die osse het by duisende gevrek aan die runderpes wat dwarsoor die land gevoed het. Die Konsessie maatskappy het vir dertig jaar met sy bedrywighede voortgegaan totdat die Munisipaliteit in 1926 die konsessiehouers oteien en hulle daarvoor vergoed het. In 1913 het Salisbury sy eerste munisipale kragentrale in werking gestel, en is later gevolg deur kleiner dog ewe roepingsbewuste en ondernemende munisipaliteite in ander dele van Rhodesië.

Vir amper 25 jaar was Rhodesië vir 'n munisipale elektrotegniese ingenieur voorwaar die Beloofde Land.

engineer, Rhodesia was indeed the Promised Land. The initial emphasis in those early days of electricity supply, both to the engineer and the local authority concerned, centred on the municipal power station, all of which operated on coal brought in from the Wankie coalfields. Completely uninhibited by restrictions of any kind, these pioneering municipal electrical engineers, with the modest transmission voltages at their disposal, spread their distribution networks to serve a number of rural, industrial, and mining consumers far beyond the confines of their respective municipal boundaries.

But the pattern was to change. In the young, virile and vast country of Rhodesia, the rapidly increasing demands for power could not be met by the municipal power undertakings alone. Accordingly in 1936 the government of the day passed the Electricity Supply Act, which, apart from creating the Rhodesian Electricity Supply Commission, also introduced the concept of licensed areas. At the same time an Electricity Control Board came into being to control the generation and supply of electrical energy and for the regulation of tariffs.

From 1936 onwards, through and after the war years, tremendous expansion took place in the power supply industry in the then Southern Rhodesia. The Electricity Supply Commission acquired all the smaller municipal power stations, and either closed them down or built others larger and more efficient in the same or more strategic places. High voltage transmission lines were taken far into the hinterland by the newly created national supply authority, to develop the as yet untouched agricultural and mineral wealth of the country. In the field of rural electrification the Rhodesian E.S.C.'s achievements were unequalled at the time.

The municipalities of Salisbury and Bulawayo, the only two local-authority-operated power stations in Rhodesia, extended their existing generating stations and built new and larger ones in addition. Elsewhere the smaller municipalities, who now bought in bulk from the E.S.C., rebuilt their distribution systems to meet the rapidly increasing demands for power within their respective licenced areas.

The concept of this urban/rural electricity development in Southern Rhodesia, with the various local authorities operating on parallel lines with the Electricity Supply Commission and often in unison, both with the generation and distribution of electricity, was perpetuated by the Electricity Act of 1956, and was to bring Rhodesia well to the forefront among the electrically developed countries in Africa.

Vir soweel die ingenieur as die betrokke plaaslike owerheid het die klem in daardie vroeë dae van elektrisiteitsverskaffing hoofsaaklik op die munisipale kragentrale geval, wat in alle gevalle steenkool gebruik het wat van die steenkoolvelde by Wankie gebring is. Totaal onbelemmerd deur beperkings van welke aard ookal, het hierdie baanbrekende munisipale elektrotegniese ingenieurs, met die beskeie verspreidingspanning tot hul beskikking, hul verspreidingsnetwerke uitgebrei om 'n aantal landelike, industriële en mynverbruikers te bedien wat ver buite die grense van hul onderskeie munisipale gebiede gelê het.

Die patroon sou egter verander. In die jong, lewenskragtige en uitgestrekte land van Rhodesië kon die snel-toenemende vraag na krag nie meer deur die munisipale ondernemings alleen versadig word nie. So het dit gekom dat die regering wat toe aan bewind was, in 1936 die Wet op Elektrisiteitsvoorsiening aangeenam het, waardeur nie alleen die Rhodesiese Elektrisiteitsvoorsieningskommissie in die lewe geroep is nie, dog wat ook die idee van gelisensieerde gebiede daargestel het. Terselfdertyd het daar 'n Elektrisiteitsbeheerraad tot stand gekom om beheer uit te oefen oor die opwekking en voorsiening van elektrisiteit en om tariewe te reguleer.

Vanaf 1936, tydens en na die oorlogsjare, het daar geweldige uitbreidings van die elektrisiteitsvoorsieningsnywerheid in die destydse Suid-Rhodesië plaasgevind. Die Elektrisiteitsvoorsieningskommissie het al die kleinere munisipale kragentrales oorgeneem en hulle óf gesluit óf met groter en meer doeltreffende sentrales, op dieselfde of op meer strategiese plekke gelê, vervang.

Hoekspanningsdistribusielyne is ver in die hinterland in gebou deur die nuutgestigte nasionale voorsieningsowerheid, ten einde die tot dusver nog onaangeraakte landboukundige en minerale rykdom van die land te ontwikkel. Op die gebied van landelike elektrifikasie het die prestasies van die Elektrisiteitsvoorsieningskommissie destyds geen weerga gehad nie.

Die Munisipaliteit van Salisbury en Bulawayo, wat die enigste twee kragentrales in Rhodesië wat deur plaaslike owerhede bestuur word, besit het, het hul bestaande opwekkingsvermoë uitgebrei en boonop nuwe en groter kragentrales gebou. Elders het die kleiner plaaslike owerhede, wat nou hul krag by grootmaat van die E.V.K. gekoop het, hul verspreidingsstelsels herbou ten einde die snel-toenemende vraag na krag in hul onderskeie gelisensieerde gebiede die hoof te kan bied.

Die idee van hierdie stedelik/landelike elektrisiteitsontwikkeling in Suid-Rhodesië, met die verskillende plaaslike owerhede wat ewewydig en dikwels in samewerking met die Elektrisiteitsvoorsieningskommissie gewerk het, sowel wat die opwekking as die verspreiding van elektriese krag betref, is deur die Elektrisiteitswet van 1956 verewig, en was bestem om Rhodesië in die voorste linie van die lande in



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Atlas design keeps Atlas ahead

But once again the pattern was to change. With demands for electricity in Southern Rhodesia doubling every 6½ years or eight times greater than it was 20 years previously there occurred a shift in emphasis in power generation. Where generating stations based on rail borne coal from the nearest coalfields were built to supply local or adjacent loads, national power grids were constructed, and with the new and previously unheard of transmission voltages employed it became possible to feed electricity from a number of suitably placed power stations into a common system and distribute it, to all the four corners of the country.

This was the dawn of a new era in the power supply industry. As recently as 1954 the largest operating turbo alternator in the United Kingdom was 60 M.W. Following an exponential rate of development there has occurred since that time a quick rush upwards in plant sizes, 120, 350, 500, 650 and even 1300 M.W. Also transmission voltages rose from 132 — 275-400kV and even 750kV with quadruple conductors instead of single to carry the phenomenally increased outputs.

Coincidental with this new pattern of generation and primary distribution of electrical energy, was the concept of the Central African Federation in 1953, and the commissioning, in 1960/61, of the colossus of Kariba on the south bank of the Zambezi River in the then Southern Rhodesia. The newly created Federal Power Board built hundreds of miles of 330kV transmission lines as an overlay to the existing 110/88 kV partial grid system in Rhodesia. The immediate effect of this was that the Electricity Supply Commission and Salisbury and Bulawayo municipalities became bulk buyers of energy from the Federal Power Board and technically the urban/rural concept thus became interconnected. Furthermore, the operation and control of the Electricity Supply Commission's Umnati Power Station and the two municipal power stations, but not the ownership, became vested in the Federal Power Board.

In similar fashion much the same trend is apparent in the Republic of South Africa, where a number of super thermal stations built on or adjacent to, the Transvaal coalfields and a series of hydro electric power stations on the Orange River will feed their combined outputs into a common 400kV grid extending, nearly 1,000 miles from the mid-Transvaal to a nuclear power source to be built on the shores of Table Bay. And more from the North. Currently contemplated is the gigantic 3,000MW Cabora Bassa project near Tete, in a gorge in the Zambezi River in

Afrika wat op die gebied van elektrisiteit ontwikkel het, te plaas.

Dog weereens sou die patroon verander. Aangesien die vraag na elektrisiteit in Suidelike Rhodesië elke 6½ jaar verdubbel het en tot agt keer so groot geword het as wat dit 20 jaar vroeër was, het daar 'n verskuiwing van die klem in die opwekking van krag plaasgevind. Waar kragentrales, met per spoor vervoerde steenkool as grondslag, oorspronklik gebou is om in die plaaslike of aangrensende vraag te voorsien, is daar nou kragnetwerke op nasionale grondslag gebou en met die nuwe en vroeër ongehoorde stroomspannings wat gebruik is, het dit moontlik geword om elektrisiteit vanaf strategies geleë kragentrales in 'n gemeenskaplike stelsel in te voer en dit na al die uithoeke van die land te versprei.

Dit het die koms van 'n nuwe bedeling in die kragverskaffingsnywerheid ingelui. So onlangs as 1954 was die grootste turbo-alternator wat in die Verenigde Koninkryk gewerk het, een van 60 M.W. Met 'n eksponensiële ontwikkelings tempo het daar egter sedertdien 'n snelle opwaartse neiging in die grootte van opwekkingsmasjinerie voorgekom—120, 350, 500, 650 en selfs 1300 M.W. Daarby het distribusiespannings vermeerder vanaf 132 tot 275 tot 400 kV, en selfs tot 750 kV met vierdubbele geleiers in stede van enkele, ten einde die fenomenaal verhoogde lewering te kan dra.

Met hierdie nuwe patroon van die opwekking en die primêre distribusie van elektrisitiese energie het saamgeval die totstandkoming van die Sentraal-Afrikaanse Federasie in 1953 en die inwerkingstelling, in 1960/61, van die kolossale Kariba-skema op die suidelike oewer van die Zambesi in die destydse Suid-Rhodesië. Die nuutgestigte Federale Kragraad het honderde myle van 330 kV- verspreidings-lyne gebou as 'n oorvleuelende stelsel vir die bestaande gedeeltelike netstelsel van 110/88kV in Rhodesië. Dit het die onmiddellike uitwerking gehad dat die Elektrisiteitsvoorsieningskommissie en die Munisipaliteit Salisbury hul krag by grootmat van die Federale Kragraad gekoop het en dat die stedelik/landelik stelsels dus onderling aaneengeskakel is. Daarbenewens het die werking en die beheer, hoewel nie die eienaarskap nie, van die Elektrisiteitsvoorsieningskommissie se kragentrales by Umnati en van Munisipale kragentrales na die Federale Kragraad oorgegaan.

'n Soortgelyke neiging is in die Republiek van Suid-Afrika te bespeur, waar 'n aantal super termiese kragentrales óp of naby die Transvaalse steenkoolvelde en 'n reeks hidro-elektriese sentrales op die Oranjerivier hul gesamentlike kraglewering in 'n gemeenskaplike netwerk van 400 kV sal invoer, welke stelsels sal strek oor die nagenoeg 1,000 myl vanaf midde-Transvaal na 'n kernkragbron wat op die strand van Tafelbaai gebou gaan word. En dan kom daar nog meer krag van die Noorde af by. Tans word daar oorweeging geskenk aan die reusagtige 3,000

Portuguese East Africa. Over 900 miles of Africa this project will connect in with South Africa's Escom grid on the Witwatersrand to create an electrical spine right down the middle of Southern and Central Africa nearly 2,000 miles in length.

At present most of Rhodesia's power comes from the Kariba interconnected system in Rhodesia and Zambia which is operated by the Central African Power Corporation. The system has an installed capacity of about 1,200MWS. Basically the system now installed could meet the anticipated demand of 1,050MWS by 1972 and with the addition of the Kafue project in Zambia it will be able to meet it comfortably. But it may be unwise to rely on Kafue and a situation is conceivable in which Rhodesia might have to depend on half the output from Kariba plus its own thermal stations. On this basis and with a 7% load growth, Rhodesia would run short of power by about 1974. It is estimated that for an additional expenditure of about £40m the installed capacity at Kariba can be more than doubled by the building of the north bank power station to a total of 1,600MWS. This second stage would cater for the requirements of Zambia and Rhodesia for a decade or so.

If Zambia decides against stage two, however, Rhodesia will have to decide independently on a major additional source of power which would require to be available from about 1974. There are three possibilities.

One is the construction of a second power station on the south bank of Kariba. In practice, however, this would need the co-operation of the Zambians on matters such as riparian rights. If the two countries are not able to reach agreement on the more attractive north bank proposition, and for which the system was designed, it is unlikely that they would agree on a second south bank station.

The second possibility would be for Rhodesia to take power from Cabora Bassa. This would be more expensive to buy than Kariba power because the Portuguese hope to use some of the revenue from Cabora Bassa to finance the development of the lower Zambesi Valley. The third and most likely possibility would be for a super new thermal station to be built on top of the coal at Wankie or in the Rhodesian Lowveld.

With these mind boggling thoughts on the future trend of power generation in Southern Africa, what

M.W.-skema by Cabora Bassa, naby Tete, in 'n ravyn in die Zambesirivier in Portugees-Oos-Afrika. Hierdie stelsel sal oor 'n afstand van 900 myl inskakel by die netwerk van die Suid-Afrikaanse Elektrisiteitsvoorsieningskommissie op die Witwatersrand, om sodoende 'n elektriese ruggraat te vorm wat vir byna 2,000 myl reg in die middel van Suidelike en Sentraal-Afrika af sal loop.

Op die oomblik kom die grootste gedeelte van Rhodesië se krag van die tussengeskakelde Kariba-stelsel in Rhodesië en Zambië af, wat onder die beheer van die Sentraal-Afrikaanse Kragfederasie staan. Hierdie stelsel beskik oor 'n geïnstalleerde vermoë van ongeveer 1,200 MWS. In die gewone loop van sake kan die stelsel wat nou geïnstalleer is, die verwagte vraag van 1,050 MWS teen 1972 bevredig, en met die toevoeging van die Kafue-projek in Zambië, sal daar met gemak in die aanvraag voorsien kan word. Dit mag egter onwys wees om te veel op Kafue staat te maak, en dit is nie onmoontlik nie dat die situasie kan ontstaan waar Rhodesië op die helfte van die lewering vanaf Kariba, plus sy eie termiese kragentrales, aangewese sal wees. Op hierdie grondslag en met 'n vraggroei van 7%, sal Rhodesië teen 1974 'n tekort aan krag ondervind. Na beraming kan, met 'n bykomstige uitgaaf van ongeveer £40 miljoen, die geïnstalleerde vermoë van Kariba meer as verdubbel word deur die kragentrales op die noordelike oewer, met 'n totaal van 1,600 MWS, te bou. Hierdie tweede stadium kan vir 'n dekade of meer in die behoeftes van sowel Rhodesië as Zambië voorsien.

Indien Zambië egter teen die tweede stadium sou besluit, sal Rhodesië alleen moet besluit oor 'n groot bykomstige bron van elektriese krag, wat vanaf ongeveer 1974 beskikbaar sal moet wees. Daar is drie moontlikhede.

Die eerste een is die bou van 'n tweede krag-sentrale op die suidelike oewer van Kariba. In die praktyk sal die samewerking van Zambië in verband met sulke sake soos oewerrege egter nodig wees. Indien die twee lande nie tot 'n ooreenkoms sou kan geraak oor die meer aantreklike skema op die noordelike oewer, waarvoor die skema oorspronklik ontwerp is, nie, is dit onwaarskynlik dat hulle sal kan saamstem oor 'n tweede sentrale op die suidelike oewer.

Die tweede moontlikheid vir Rhodesië is om krag vanaf Cabora Bassa te koop. Hierdie krag sal duurder wees as dié vanaf Kariba, aangesien die Portugese hoop om 'n gedeelte van die inkomste uit Cabora Bassa te gebruik om die ontwikkeling van die lear-Zabesivallei te finansier. Die derde en mees waarskynlike moontlikheid is om 'n super termiese krag-sentrale bo-op die steenkoolvelde by Wankie of iewers in die Rhodesiese Laeveld te bou.

Met al hierdie oorwegings wat ons gedagtes in verband met toekomstige neigings ten opsigte van

then is the future of municipal power generation? Clearly the likelihood of future generation by local authorities in Rhodesia is much in the balance. In the Republic of South Africa it is the declared policy of the government of that country that future power generation will tend to be more, if not entirely, the responsibility of South African Escom. One cannot dispute the wisdom and indeed the very necessity in the national interests, that one central generating authority be concerned with bold and forward planning and to look at the picture in its broadest dimensions rather than the separate areas of interest served by a local authority. There is another aspect. Local authorities fear the huge finance charges to be borne by present electricity consumers in so rapidly having to establish large-scale concepts of power generation for posterity. Local authorities have to live hand to mouth with each years' rate income which has to be stretched to fund, apart from providing adequate power supplies, all the other and insatiable community demands for modern living.

Let us now turn from generation to the distribution of electricity. In the Republic of South Africa the long established pattern of power distribution based on the urban/rural-Escom/local authorities association, remains virtually unchanged and the workability of this twin association has been proven to have been highly successful by the visible and spectacular developments in the field of power generation and distribution in the Republic of South Africa in recent years. The same is true of Rhodesia except that, whereas in South Africa the structure of the power industry is a relatively simple one stemming from the responsible ministry down through the Electricity Control Board, Escom and the municipalities, here in Rhodesia the structure is far more complex. At the top responsibility is vested in the Ministry of Transport and Power. The Central African Power Corporation is responsible for generation of power at Kariba and combines with the Electricity Supply Commission and the two municipal power stations. In turn the Electricity Supply Commission and the Salisbury and Bulawayo City Councils buy in bulk from the Power Board. Also the Electricity Supply Commission sell energy bought in bulk from the Power Board to the smaller municipalities. At various border points—Victoria Falls, Umtali and Beit Bridge energy is "imported". In addition some of the big industrial users generate their own power. At first glance this is a lot of harness for one horse.

kragopwekking in Suidelike Afrika besig hou, ontstaan die vraag van wat die toekoms me betrekking tot kragopwekking deur plaaslik owerhede inhou. Dit is duidelike dat die moontlikhede van kragopwekking deur Munisipaliteite in Rhodesië in die toekoms in 'n groot mate in die weegskaal hang. In die Republiek van Suid-Afrika is dit die verklaarde beleid van die Regering van daardie land dat die opwekking van krag in die toekoms meer en meer, indien nie algeheel nie, die verantwoordelikheid van Suid-Afrika se Evkom sal wees. Die wysheid, ja selfs die noodsaaklikheid daarvan dat een sentrale opwekkingsowerheid met die onverskrokke vooruitbeplanning wat in die nasionale belang nodig is, gemeed moet wees en dat die saak vanuit die breëre nasionale oogpunt liever as uit die oogpunt van die beperkte plaaslike belange wat deur plaaslike gedien word, gesien moet word, kan nie betwis word nie. Daar is egter ook 'n ander aspek. Plaaslike besture vrees die geweldige finansiële las wat deur huidige verbruikers van elektriese krag gedra moet word omdat hulle so gou sulke groot-skaalse opwekkingskemas ten behoeve van die nageslag moet daarstel. Plaaslike besture leef van die hand na die mond op die belasting-inkomste van elke jaar, wat tot die uiterste gerek moet word om, afgesien van voldoende elektriese kragvoorrade, ook al die ander onversadigbare eise vir moderne geriewe van die belastingbetaler te finansier.

Laat ons, ons nou van die opwekking na die verspreiding van elektrisiteit wend. In die Republiek van Suid-Afrika het die gevestigde patroon van krag-distribusie, gebaseer op die stedelik/landelike—Evkom/plaaslike besture-verbintenis, onveranderd gebly en die sigbare en skouspelagtige ontwikkelinge op die gebied van kragopwekking en -distribusie in die Republiek gedurende die afgelope jare het afdoende bewys gelewer van die praktiese uitvoerbaarheid van hierdie dubbele verbintenis. Dieselfde is waar van Rhodesië, behalwe dat, waar die struktuur van die kragnywerheid in Suid-Afrika betreklik eenvoudig is, nl. vanaf die verantwoordelike Ministerie af, deur die Elektrisiteitsbeheerraad, Evkom en die Munisipaliteite, is die struktuur hier in Rhodesië heelwat meer ingewikkeld. Bo-aan is die verantwoordelikheid in die Ministerie van Vervoer en Kragvoorsiening gevestig. Die Sentraal-Afrikaanse Kragkorporasie is verantwoordelik vir die opwekking van krag te Kariba, in aansluiting by die Elektrisiteitsvoorsieningskommissie en munisipale kragsentrales.

Op hul beurt koop die Elektrisiteitsvoorsieningskommissie en die Stadsrade van Salisbury en Bulawayo hul kragvoorrade by die grootmaak van die Kragraad. Daarbenewens verkoop die Elektrisiteitsvoorsieningskommissie die krag wat hy by grootmaak van die Kragraad aangekoop het, weer aan die kleiner munisipaliteite. By verskillende grensposte, nl. by die Victoria-waterval, Umtali en Beitbrug, word krag "ingevoer". Boonop wek sommige van die groter nywer-

Current thinking in Rhodesia at Government and official level is that rationalisation and streamlining of the power industry could be better and more speedily be achieved by eliminating local authorities from the business of electricity supply by encouraging them, on a voluntary basis, to "amalgamate" with the national supply authority.

Unvarnished, of course, this means the eventual achievement of partial or complete nationalisation of the electricity supply industry in Rhodesia. But the municipalities are showing resistance to any take-over bid and not without good reason. Their respective electricity undertakings have a history of long established and proven economic viability and stability as well as continuing to provide service to their consumers which has been and still is both paramount and unassailable. Because of this they are not enamoured with the blandishments offered by a take-over nor are they suitably impressed with the alleged benefits of nationalisation. They seek to preserve their democratic rights to remain masters in their own house and to continue to use electricity trading profits for unremunerative community services such as transport, traffic and amenities.

However, the need for some rationalisation nobody will deny. This is an inevitable consequence of change in a rapidly changing world. But the necessity to change must be logical and securely set on proven economic foundations. Not just to present a neat family tree. Problems and pressures associated with the present system are there right enough both in Rhodesia and the Republic of South Africa. The new emphasis on power generation has, in Rhodesia, created contentious tariffing problems. There is the paramount need to create the optimum regeneration of capital from within the resources of each undertaking for an industry whose limits of growth are unbounded. The intrusion of one supply authority into the licenced area of another, particularly when municipal boundaries are extended outwards, has created a conflict of interests to give rise in the Republic of South Africa, and to some extent in Rhodesia, to the headache of Rights of Supply. There is the demanding necessity to make the fullest use of trained and skilled manpower within and between one undertaking and another or over the power supply industry as a whole. There is the difficulty of attracting and indeed in retaining professional, technical and artisan personnel under the existing blanket format of municipal staff grading, a difficulty which I may say here has been much aggravated in the Republic of South Africa by the pegging of certain Municipal salaries. Lastly one cannot be

heidsverbruikers hul eie krag op. By die eerste oogopslag lyk dit darem na 'n groot las vir die kameel re rug!

Die huidige denkrigting op amptelike en Regeringsvlak in Rhodesië is dat die rasionalisasie en stroombelyning van die kragvoorsieningsnywerheid beter en gouer verwesenlik kan word indien plaaslike owerhede heeltemal uit die veld van elektrisiteitsvoorsiening uitgeskakel kan word deur hulle aan te moedig om, op 'n vrywillige grondslag, met die nasionale voorsieningsowerheid te "amalgameer." Sonder die vernis beteken dit natuurlik die uiteindelijke verwesenliking van die algehele of gedeeltelike nasionalisasie van die kragvoorsieningsnywerheid in Rhodesië. Die Munisipaliteite bied egter weerstand teen enige poging tot oorname, en nie sonder goeie rede nie. Hul onderskeie elektrisiteitsondernemings het 'n geskeidenis opgebou van lang-gevestigde en welbewese ekonomiese lewensvatbaarheid en stabiliteit, sowel as 'n mate van kontinuïteit in die verskaffing van krag aan hul verbruikers wat sowel oorheersend as onaantastbaar is. Om hierdie rede het hulle nie onder die bekoring gekom van die aantreklikhede wat deur 'n oorname aangebied word nie en is hulle ook nie genoegsaam beindruk deur die beweerde voordele van nasionalisasie nie. Hulle wil slegs maar hul demokratiese reg behou om baas in hul eie huise te wees en om voortdurend elektrisiteits handel profyt te gebruik vir onvoordelige dienste soos transport en verkeers geriewe.

Niemand sal egter onken dat daar wel 'n behoefte aan 'n mate van rasionalisasie van die voorsiening en verspreiding van elektrisiteit bestaan nie. Dit is 'n onvermydelike gevolg van die veranderinge wat daar in 'n snel-veranderende wêreld plaasvind. Die noodsaaklikheid van veranderings moet egter logies wees en moet veilig op bewese ekonomiese fondamente rus; dit moet nie alleen bedoel wees om 'n mooie stamboom daar te stel nie. Dat daar aan die bestaande stelsel, sowel in Rhodesië as in die Republiek van Suid-Afrika, sekere vraagstukke en pressies verbande is, kan nie ontken word nie. Die nuwe klem op die opwekking van krag het in Rhodesië tot sekere probleme met betrekking tot tariewe aanleiding gegee. Daar is die oorheersende noodsaaklikheid daarvan om die maksimum hoeveelheid kapitaal vanuit die interne bronne van elke onderneming te herwin in die belang van 'n nywerheid waarvan die groei moontlikhede geen grense ken nie. Die indringing van een voorsieningsowerheid in die gelisensieerde gebied van 'n ander, veral wanneer munisipale grense na buite uitgebrei word, het 'n botsing van belange geskep wat in die Republiek van Suid-Afrika, en in 'n mindere mate in Rhodesië, tot die netelinge probleem van Voorsieningsregte aanleiding gegee het. Daar is die dringende noodsaaklikheid om die volste gebruik te maak van opgeleide en geskoolde arbeid binne en tussen elke onderneming en elke ander een, of in

unmindful of the possible administrative, technical and economic advantages of establishing one single supply authority in place of a multiplicity of smaller ones to serve a complex of peri-urban local authorities or densely populated metropolitan centres, all of which have grown up cheek by jowl or spilled over one into another.

Serious attempts at Governmental level have been made in Rhodesia to resolve these problems and pressures and to ascertain if some other pattern of supply would be more suited to the needs of the country. Strangely enough exhaustive investigation revealed that a large number, if not all, the alleged disabilities were more apparent than real and that, with certain modifications and additional measures of control, the existing pattern embodying as it does the urban-rural/local authority-E.S.C. concept was not entirely without merit.

The concept of Area Boards was rejected for the reason that the country was not adequately developed nor the staple industries sufficiently established to make large sparsely populated geographic areas viable economic units. The alternative of immediate unification of local authorities with the national supply authority, namely the Rhodesian Electricity Supply Commission, was rejected because of the implications of the legislation which would be required to achieve it.

I would not venture to postulate on what pattern the future of the electricity supply industry should or would take either here in Rhodesia or in the Republic of South Africa, to achieve the greatest possible operating efficiency. The whole subject is far too complex to give a definite conclusion. Possibly in the final analysis the answer will be given by the natural process of evolution, by objective thinking of all concerned and where plain common sense supported by irrefutable economic evidence dictates any change to be made. In this process I trust that economically viable municipal electricity supply undertakings will not be eyed and envied as the jewel to be stolen from the Temple of Local Enterprise and Autonomy, but will continue to serve the industry in all its many facets in the same exemplary and efficient fashion they have done in the past to which the Proceedings of this Association bear full testimony.

belang van die nywerheid as geheel. Daar is die moeilikhede wat ondervind word om professionele, tegniese en ambagspersoneel te trek en te behou onder die bestaande oorkoepelende stelsel van munisipale personeelgradering. Ek kan hier konstateer dat hierdie moeilikhede verder vererger is deur die vaspenning van sekere Munisipale salarisse in die Republiek van Suid-Afrika.

Laastens kan mens die die feit ignoreer nie dat daar moontlik administratiewe, tegniese en ekonomiese voordele verbonde kan wees aan die daarstelling van één sentrale voorsieningsowerheid in die plek van 'n veelheid van kleineres, om 'n kompleks van buite-stedelike plaaslike owerhede of digbevolkte metropolitaanse sentra te bedien, wat almal langs mekaar opgegroeï in mekaar oorgeloopt het.

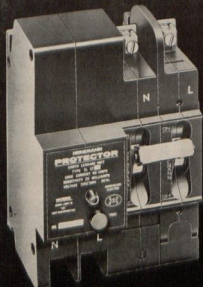
In Rhodesië is daar van staatsweë ernstige pogings aangewend om hierdie vraagstukke op te los en die drukking te verlig, sowel as om vas te stel of die een of ander nuwe voorsieningspatroon beter in die behoeftes van die land sal voorsien. Vreemd genoeg het noukeuige navorsing aan die lig gebring dat 'n groot persentasie van die beweerde tekortkominge meer skynbaar as werklik was en dat, met sekere modifikasies en bykomende beheermaatreëls, die bestaande patroon, wat die landelik-stedelike/plaaslike owerheid-Evkom-konsep beliggaam, nie heeltemal sonder verdienste is nie.

Die idee van Gebiedsrade is verwerp vanweë die feit dat die land nog nie genoegsaam ontwikkel en die stapelnywerhede nog nie voldoende gevestig was om van groot en ylbevolkte geografiese gebiede lewensvatbare ekonomiese eenhede te maak nie. Die alternatief, nl. die onmiddellike unifikasie van plaaslike owerhede met die nasionale voorsieningsowerheid, d.w.s. die Rhodesiese Elektrisiteitsvoorsieningskommissie, is ook verwerp vanweë die implikasies van die wetgewing wat nodig sal wees om dit te bewerkstellig.

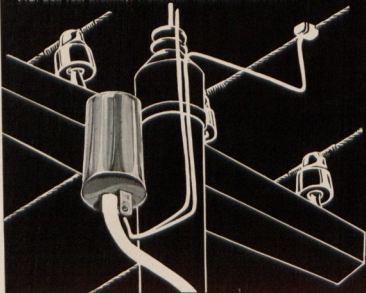
Ek sou nie graag wou waag om 'n mening uit te spreek oor welke patroon die toekomstige ontwikkeling van die elektrisiteitsvoorsieningsnywerheid hier in Rhodesië of in die Republiek van Suid-Afrika gaan of behoort te volg om die grootste moontlik bedryfsdoeltreffendheid te bereik nie. Die onderwerp as geheel is veels te ingewikkeld om tot 'n definitiewe gevolgtrekking te kom. Moontlik sal die finale antwoord gegee word deur die natuurlike proses van ewolusie, deur 'n positiewe denkrigting by alle betrokkenes 'n toestand waar doodgewone gesonde verstand, gerugsteun deur onbetwisbare ekonomiese getuïens, sal voorskryf welke veranderings, indien enige, daar moet plaasvind. Ek vertrou dat, in hierdie proses, ekonomies lewensvatbare munisipale elektrisiteitsvoorsieningsowerhede nie gesien sal word as die juweel wat uit die Tempel van Plaaslike Ondernemingsgees en Outoonomie gesteel kan word nie, dog dat hulle sal voortgaan om die nywerheid in al sy vele fasette op dieselfde voorbeeldige en doeltreffende wyse te dien as

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And to conclude, what of the future? Will the pattern of change in power generation and distribution be as dramatic as many of us here today have seen it? Indications are that it assuredly will. Great changes in the pattern of energy resources have taken place over the past two or three decades and are continuing to do so. In the majority of countries coal remains the most important energy resource and is used to provide in thermal stations, more than 70% of the electric power produced in the world. But the use of coal as a contribution to the total electrical energy output is decreasing and the utilisation of hydro-power is fast approaching the possible maximum. The use of oil and natural gas for power is growing rapidly and nuclear energy is becoming of supreme importance. In Britain today 10% of all power is generated in atomic fired or nuclear power stations with a total capacity of 3,000MW. A second nuclear building programme for stations totalling 8,000MW is planned. Many other countries are expanding nuclear power output. The total estimated nuclear power capacity in 1967 was 30,000MW and is expected to increase to 210,000MW by 1975 and 300,000MW by 1980. It is estimated that during the period 1975 to 1980, 65% of all new generating stations will be nuclear. It was stated at the World Power Conference held in Moscow last year that by raising the degree of the use of uranium in fast breeder reactors, the cost of nuclear produced power has reached parity with the cost of power derived from organic fuel. Also the simultaneous use of nuclear energy for electric power generation and the accompanying gamma radiation for promoting chemical reactors is a means of reducing costs. In the U.S.S.R. combined power stations and chemical factories are envisaged in which the value of the chemical by-products in nuclear power generation almost equals the value of the power produced.

To get a little closer to reality in the Republic of South Africa and Rhodesia, what do these changing patterns in energy resources portend? Atomic fired power stations could bring a return to localised generation and, given a stretch of lake or sea water and a lorry load of enriched uranium or processed plutonium fuel, would silently go about their business of providing us with light and warmth for our homes and power for our industry. And in the Republic of South Africa all the messy fuel carrying railway systems supplying coal eating and smog producing thermal power stations tied together with hundreds of miles of aesthetically unattractive transmission lines, would

wat hulle dit gedoen het en van welke diens die Verrigtinge van hierdie Vereniging afdoende bewys lewer.

En, om mee af te sluit, wat van die toekoms? Sal die patroon van verandering in die opwekking en verspreiding van krag so dramaties wees as wat baie van ons vandag hier teenwoordig is, dit sien gebeur het? Aanduidings is dat dit beslis so sal wees. Groot patroonsveranderinge in kragontwikkeling, het in die afgelope dekades plaasgevind en vind nog steeds op die huidige oomblik plaas. In die meeste lande bly steelkool nog steeds die belangrikste bron van energie, en word in termiese kragstasies gebruik om meer as 70% van die wêreld se elektriese krag te vervaardig. Maar die gebruik van steenkool, as 'n bydrae tot die totale energie-vervaardiging, is aan die afneem, en die gebruikmaking van hidroelektriese krag is vinnig besig om die moontlike maksimum te bereik. Die gebruik van olie en natuurlike gas vir kragontwikkeling is vinnig aan die toeneem en kernkrag begin nou net belangrik word. In Brittanje is 10% van alle krag ontwikkel in atoomaangedrewe of kernkragstasies met 'n totale vermoë van 3,000 M.W. 'n tweede kernbouprogram vir kragstasies met 'n totaal van 8,000 M.W. word beplan. Verskeie ander lande brei hulle kern ontwikkeling uit. Die totale kernkragontwikkeling volgens skatting in 1967 was 30,000 M.W. en dit word verwag dat dit sal vermeerder tot 210,000 M.W. teen 1975 en 300,000 M.W. teen 1980. Daar word geskat dat gedurende die periode 1975 tot 1980, 65% van die nuwe kragstasies kernaangedrewe sal wees. Dit was verlede jaar by die Wêreld Elektriese krag Konferensie, gehou in Moskou, gesê dat deur die gebruik van uraan te vermeerder in verwekker reaktors, die koste van kern-vervaardigde elektriese krag gelykstaande is aan die koste verbonde aan krag verkry van organiese brandstof. Ook die gelyktydige gebruik van kern energie vir elektriese krag ontwikkeling, en die gepaardgaande gammastraling vir bevordering van chemiese reaktors is 'n manier om koste te verminder. In Rusland word gekombineerde kragstasies en chemiese fabriek beoog, waarin die waarde van die chemiese byprodukte in kernkrag-ontwikkeling amper gelykstaande is aan die waarde van die krag geproduseer.

Om nader te kom tot die werklikheid in die R.S.A. en Rhodesië, wat voorspel hierdie veranderinge in energiebronne vir die toekoms. Atoom-aangedrewe kragstasies sal 'n terugkeer tot plaaslike kragopwekking teweeg bring en, met 'n stuk meer— of seewater en 'n wawrag plutonium of veredelde uraan tot hul beskikking, kan hulle sonder ophof voortgaan om ons van lig en warmte en krag vir ons nywerhede te voorsien. En in die Republiek van Suid-Afrika sal al die morsige brandstofdraende spoorwegstelsels wat steenkoolvertrede en rookmisproduserende termiese kraagtrales en brandstof voorsien, sowel as die honderde myle esteties onaan-

remain as an anachronism and a symbol of a past and wasteful age. If strong growth points could be established at Kariba and Cabora Bassa the ideal of local atomic/hydro pumped storage looms into prospect. Such, coupled with the increasing size and swiftness of modern air transport, could change Central Africa in half a century.

The address was received with acclamation and a sincere vote of thanks was conveyed by Mr. R. Leishman (Johannesburg). He referred with appreciation to the President's having drawn attention to the difficulties besetting municipal electricity undertakings, particularly in relation to threats of nationalisation and rationalisation. In conclusion, he hoped that Mr. Turner would find special inspiration during his two years of office to steer the Association and its members in both the Republic of South Africa and Rhodesia towards a mutually acceptable attitude of collaboration between electricity supply commissions and municipal power supply undertakings and towards restraint on capital costs which in the end must principally be shared by already overburdened ratepayers of metropolitan centres.

Mr. J. N. Jones (Bulawayo) seconded Mr. Leishman's vote of thanks.

Greetings and apologies were next conveyed to the Convention, which thereafter adjourned.

First Day, AFTERNOON SESSION

In response to the President's request for nominations for the office of President-Elect, Mr. J. C. Waddy (Pietermaritzburg) addressed the meeting as follows:

In looking around for someone who is capable of carrying out the duties of President in due course, one has to find someone who is not only a good engineer but is also capable of doing two jobs at the same time; and it's also been said that he should be a qualified lawyer among other things and perhaps also a referee at times!

The person I have in mind who, I think, measures up to those requirements very well, is Mr. J. K. von Ahlften, the Town Electrical Engineer of Springs. He is very well known to nearly all of you, I think, and to those of you who know him well it's not necessary for me to say very much; but for the benefit of those of you who don't know him I should perhaps mention that he is a Transvaler by birth but when he wanted to do his academic training he went down to the Cape, to Stellenbosch. It was there that he first showed that he is capable of doing things twice as well as most of

treklike verspreidingslyne wat hulle met mekaar verbind, bly staan as 'n anachronisme en 'n simbool van 'n vergange en spandaberiige eeu. Indien sterk groeipunte by Kariba en Cabora Bassa gevestig kan word, verskyn die ideaal van plaaslike atoom/hidro-gepompte opberging op die horizon. Dit, gekoppel met die toenemende grootte en snelheid van moderne lugvervoer, kan binne 'n halfeeu 'n totale verandering in Sentraal-Afrika teweegbring.

Die rede word met toejuiging begroet en Mnr. R. Leishman (Johannesburg) stel 'n mosie van opregte dank voor. Hy verwys met waardering na die feit dat die President die aandag gevestig het op die probleme wat munisipale elektrisiteitsondernemings ondervind, veral met betrekking tot dreigemente van nasionalisasie en rasionalisasie. Ten slotte spreek hy die hoop uit dat Mnr. Turner gedurende sy ampstermyn van twee jaar spesiale inspirasie mag vind om die Vereniging en sy lede in sowel die Republiek van S.A. as Rhodesië te lei na 'n wedersyds aanvaarbare benadering van samewerking tussen elektrisiteitsvoorsiensingskommissies en munisipale kragvoorsiensingsondernemings en na 'n beperking van kapitale uitgawes, wat uiteindelik deur die reeds oorlaaide belastingbetalers van metropolietaanse sentra gedra moet word.

Mnr. J. N. Jones (Bulawayo) sekondeer Mnr. Leishman se mosie van dank.

Hierna word groete en verskonings aan die Konvensie oorgedra, waarna die Konvensie verdaag.

Eerste Dag, NAMIDDAGSITTING

In antwoord op die President se versoek vir nominasies vir die amp van Aangewese President, spreek Mnr. J. C. Waddy (Pietermaritzburg) die vergadering soos volg toe:

us and he was not content with getting one B.Sc; he got two—one in Engineering and one in Pure Science!

He qualified in 1947 and he then took a position as Assistant Electrical Engineer at Vanderbijlpark, remained there for four years and then took the post of Town Electrical Engineer at Sasolburg. He held that for twelve years and then took up the position which he still holds as Town Electrical and Mechanical Engineer of Springs, and in holding the position of Town Electrical and Mechanical Engineer, once again he showed that he is capable of doing two jobs!

He has belonged to the AMEU since 1957 and has served on the Executive for a good many years; he has also been Secretary, Vice-Chairman and Chairman of the Highveld Branch; he has represented AMEU on various SABS sub-committees for several years.

When it came to matrimony, I can assure you that he was more conventional, he didn't do things twice

there — he only has one wife — and I'm sure that she would be able to assist him in the many duties that fall to the lot of a wife of a president and I'm sure that she would be able to carry out those duties ex-

The proposal was seconded and there being no further nominations, Mr. J. K. von Ahlften (Springs) was unanimously elected President-Elect. He addressed the Convention as follows:

It is quite an unexpected honour which you have bestowed on me today and I wish to thank everybody present for the faith they've placed in me in electing me to this high honour, not only for myself but also for the Town Council of Springs. I think it is the third occasion on which this has been the honour of Springs and I think our President at the moment was a pre-

The next item on the agenda was the venue of the next Convention and Councillor Tyers (Cape Town) conveyed, on behalf of his city, an invitation to hold the 1971 Convention in Cape Town. The invitation was accepted with acclamation.

Councillor de Kock (Potchefstroom) referred to a written invitation which had been made to the Association to hold the 1970 Technical meeting in his town. The invitation was unanimously accepted.

Turning to the Constitution of the Association, the Convention was first asked formally to adopt the Afrikaans text of the Constitution as published in the 1967 Proceedings, Volume (2). Mr. P. J. Botes (Roodepoort) stated that he thought that, as some of the alterations to the Constitution would be sent to a sub-committee, the Afrikaans text, as it now stood, could not be accepted.

The President then said:

Under the next item there are **two amendments** proposed, as you will see: Now in considering this item on the Agenda it is important that we clearly understand the procedure laid down in the Constitution for its amendment, and I quote Clause 24 (i) from our Constitution, which reads as follows:

Amendment of Constitution: (i) This Constitution may be amended by decision of a Convention and after the Executive Council has reported to the Convention on the proposed amendment.

Now I have been instructed by the Executive to convey to this Convention its report that the proposed amendments have been duly considered.

The President-Elect explained the position in Afrikaans and Mr. P. J. Botes (Roodepoort) then said:

tremlig well.

Dit is vir my aangenaam om Mnr. von Ahlften voor te stel as die Aangewese President.

Die voorstel word gesekondeer en, aangesien daar geen verdere nominasies is nie, word Mnr. J. K. von Ahlften (Springs) eenparig tot Aangewese President verkies. Hy spreek die Konvensie soos volg toe:

vious Town Electrical Engineer of Springs too.

Dames en here, Mnr. die President, dis vir my 'n groot voorreg en eer om vandag hier te staan. Dit is 'n bietjie onverwags maar ek hoop net dat u keuse 'n goeie een sal wees en dat ek aan u verwagtinge sal voldoen. Nogmaals sê ek baie dankie.

Die volgende item op die sakelys is die vergaderplek van die volgende Konvensie en Raadslid Tyers (Kaapstad) rig namens sy stad 'n uitnodiging aan die Vereniging om die 1971-Konvensie in Kaapstad te hou. Die uitnodiging word onder toejuigig aanvaar.

Raadslid de Kock (Potchefstroom) verwys na 'n skriftelike uitnodiging wat aan die Vereniging gerig is om die Tegnieese Vergadering van 1970 in sy dorp te hou. Die uitnodiging word eenparig aanvaar.

Met verwysing na die Grondwet wat die Vereniging, word die Konvensie in die eerste plek gevra om die Afrikaanse teks van die Grondwet, soos in Volume (2) van die Verrigtinge van 1967 gepubliseer, formeel te aanvaar. Mnr. P. J. Botes (Roodepoort) sê dat hy van mening is dat, aangesien sommige van die wysigings van die Grondwet na 'n sub-komitee verwys gaan word, die Afrikaanse teks nie in sy huidige vorm aanvaar kan word nie.

Hierop sê die President:

The recommendation is that, in view of certain far-reaching amendments which the Executive has undertaken to submit to the members of the 1971 Convention which follows correspondence and discussions with the South African Secretary of the Interior, it is recommended that the proposals now before us, be referred back to the Executive Council for further consideration together with all others forthcoming during the intervening period and for final submission to the 1971 Convention.

I therefore formally move accordingly and before reporting this amendment I would ask Mr. von Ahlften, our President-Elect, to explain the position to you in Afrikaans.

Die Aangewese President verduidelik die posisie in Afrikaans, waarop Mnr. P. J. Botes (Roodepoort) soos volg reageer:

Vergun my net die geleentheid om u geluk te wens met u verkiesing. Ons vertrou dat u 'n aangename twee jaar as President van die Vereniging sal geniet, asook Mnr. von Ahlften met sy verkiesing as Aangewese President van ons Vereniging.

Mnr. die President, na aanleiding van u verduideliking sekondeer ek die voorstel dat die wysigings

The proposal as submitted by the President was unanimously accepted.

The Convention next received reports from representatives of branches to the Executive Council for 1969-71, as follows:

Hoëveld: Mr. F. J. van der Merwe (Stilfontein)
Cape Eastern: Mr. M. Clarke (Somerset East)
Good Hope: Mr. W. P. Rattey (Strand)
Natal: Mr. R. A. Paull (Empangeni)
Rhodesia: Mr. H. T. Turner (Umtali).

It was recorded that the President, Mr. H. T. Turner, and the President-Elect, Mr. J. K. von Ahlften, were members of the Executive Council and the election of the remaining six Engineer members resulted in those listed below being appointed:

R. W. Barton, Welkom;
R. M. O. Simpson, Durban;
G. C. Theron, Vanderbijlpark;
A. C. T. Frantz, Cape Town;
R. Leishman, Johannesburg.

In declaring the result of the election the following morning, the President thanked those past members of the Executive who had not been re-elected for the services they had given to the Association.

The Annual Report of the Secretaries, which appeared in Volume (1) of the 1969 Proceedings, was next dealt with and Councillor L. Jamneck (Vanderbijlpark) addressed the Convention as follows:

Vergun my net 'n oomblik om u hartlik geluk te wens met u verkiesing, die baie mooi manier waarop dit plaasgevind het vanoggend, asook Mnr. von Ahlften met sy verkiesing as Inkomende President. En dan ek dink dit sal seker by almal wat hier teenwoordig is byval vind, ons wil die Rhodesiërs en in besonder Umtali, baie dankie sê vir die prominente plek waarop hulle ons Republikeinsevlag vandag op die verhoog daar onder in die saal waar ons vanoggend bemekaar gekom het, tentoongestel het. Ons waardeer dit en ons hoop en vertrou dat Rhodesië dieselfde welslae sal bereik as wat die Republiek bereik het.

Veel is in die laaste vier jaar gesê oor die Sekretaris se Verslag en ek is bly dat dit in die notule opgeteen staan, want dit gee vir my 'n basis waarteen die huidige verslag wat voor u lê, gemeet kan word. Die wenke aan die hand gedoen, is lank reeds opgevolg waar

na 'n sub-komitee verwys word. Ek glo dan nie dit sal nodig wees vir my om my oorwegings te motiveer nie. Ek weet nie hoe u daaromtrent voel nie; ek het die motivering hiervan hier voor my, maar ek dink na aanleiding daarvan dat ons dit terugverwys na 'n sub-komitee, sekondeer ek die voorstel wat deur die Uitvoerende Bestuur gemaak is.

Die voorstel deur die President ingedien word hierna eenparig aanvaar.

Die Konvensie ontvang vervolgens die volgende verslae vir 1969/71 van afgevaardigdes van Streeks-takke aan die Uitvoerende Raad:

Hoëveld: Mnr. F. J. van der Merwe (Stilfontein)
Oos-Kaapland: Mnr. M. Clarke (Somerset-Oos)
Goëie Hoop: Mnr. W. P. Rattey (Strand)
Natal: Mnr. R. A. Paull (Empangeni)
Rhodesië: Mnr. H. T. Turner (Umtali).

Daar word te boek gestel dat die President, Mnr. H. T. Turner, en die Aangewese President, Mnr. J. K. von Ahlften, lede van die Uitvoerende Raad is, en die verkiesing van die orige ses Ingenieurlede lei daartoe dat die volgende persone as lede van die Uitvoerende Raad aangewys is:

R. W. Barton; Welkom
R. M. O. Simpson; Durban
G. C. Theron; Vanderbijlpark
A. C. T. Frantz; Kaapstad
R. Leishman; Johannesburg.

Toe die President die volgende oggend die uitslag van die verkiesing aankondig, bedank hy die gewese lede van die Uitvoerende Raad wat nie herkies is nie, vir die dienste wat hulle aan die Vereniging gelewer het.

Die Jaarverslag van die Sekretariaat, wat in Deel (1) van die Verrigtinge vir 1969 gepubliseer is, word vervolgens behandel, en in hierdie verband spreek Raadslid L. Jamneck (Vanderbijlpark) die Konvensie soos volg toe:

enigsins prakties moontlik, en die hoë standaard van verrigtinge getuig van die liefde waarmee die werk gedoen word. Die werk om die toesprake van sommige raadslede (ek moes eintlik eers gesê het, ingenieurs) en die ingenieurs te redigeer om daaruit sin te maak wanneer dit in druk verskyn, is inderdaad 'n toegevyde taak — nie 'n liefdestaak nie, eintlik 'n toegevyde taak — en getuig van die fyn aanvoeling deur die Sekretaris. Dit is so maklik om later om te draai en soos sommige van die politici te sê: „Ek was uit verband aangehaal”.

Kom ons kyk waar ons vandag staan: die Verrigtinge word in vier volumes per jaar gepubliseer ten einde die uitsluiting daarvan te bespoedig, en as dit in aanmerking geneem word dat die stukke nog vertaal moet word na ontvangs en voordat dit na die drukkers gaan, dan is dit inderdaad 'n prestasie (en ek moet sê

ek ken die vertaler ook persoonlik goed).

Daar is 'n deurloep vertaling van die toesprake by die Konvensie beskikbaar en die hoë standaard van die opname en vertalings en reproduksiestelsel het reeds baie gunstige kommentaar uitgelok.

So I have learned, Mr. Ewing, only the best is good enough and that is what is given this Association. Baie dankie, Mnr. Ewing.

En so moet dit ook wees, maar nou moet ons nie huiwer om 'n paar syfers reghoekig in die oë kyk nie. Soos ons uit die verslag sal sien, werk ons tans op 'n

In seconding the proposal, Mr. R. W. Barton (Welkom said:

I would like first of all to associate myself with the preliminary remarks made by Councillor Jamneck, to wish you every success in your two years of office, Mr. President, and also the very best of luck to Mr. von Ahlfen.

I've long ago learnt that the seconder of a proposal has very little to do; there's not much point in his preparing any sort of discourse on the subject he's seconding, because invariably the proposer steals all the thunder and does all that's necessary! I looked back through the records of previous conventions just to see what these poor chaps did and I found that in sheer frustration they either turned to poetry or else they told an allegedly funny story. I'm no poet so I'd like to illustrate a point by telling you the story about the young married lady who wasn't feeling too well and this persisted for a few days, so she mentioned it to her husband and he suggested that she go to the hospital and get herself looked at. So she went round, but, unknown to her, this hospital was very modern and had been completed automated and was operated by a computer. She walked into the reception room; there wasn't a soul there and all she saw was a big laundry basket on the floor with a notice on it which said: "Remove your clothes and put them in this basket". She did this and as soon as she dropped her clothes in, the notice disappeared and another one popped up saying: "Now pass through into the next room"; which she duly did. There she found three doors in the opposite wall: over the one there was a sign which read, "If your trouble is in the middle of the body, go through this door"; "If it's above the

verlies en dit moet reggestel word. In die regte perspektief gesien en met inagneming van die omvang van die Organisasie en die goeie werk op hoë vlak deur die Uitvoerende Raad en Sekretariaat verrig word, is die uitgewes werklikwaar nie te hoog nie. Die VMEQ, u Vereniging, word op die hoogste Staatsvlak geken en ons kan trots wees op dit wat deur die samesprekings bereik word.

I now propose the adoption of the Report and a word of thanks to Mr. Ewing and his staff for all the hard work and co-operation at all times.

Toe hy die voorstel sekondeer, sê Mnr. R. W. Barton (Welkom):

middle, go through that door"; and the next one, "If it's below the middle, go in the third door"!

Anyway, she felt her trouble was somewhere round the middle so she went through the appropriate door and when she got into this particular room she found a trolley with the following notice on it: "Now lie down on the trolley" — which she did. She had no sooner done this, than the thing took off under its own steam and it sailed down corridors, up passages and through rooms, into laboratories, etc., in each of which something happened to her. She either had her temperature taken or her pulse felt or a blood sample was taken and so forth. After she'd endured this for half an hour or so, she ended up in a final room where a rubber stamp came down and stamped her on the tummy and the next thing the trolley up-ended and she was on her feet in front of the laundry basket with this notice: "Put on your clothes and go home".

She put on her clothes and went home, and in due course recounted the morning's happenings to her husband, who was curious to know what the rubber stamp said. She explained that the print was too small to read, so he rummaged round for a magnifying glass and peered at the mark which read: "Pregnant—when you can read this without magnification, come to the hospital for a check up"!

There is a point in telling this story; it is to illustrate that nobody needs a magnifying glass to see what a first class job of work Dick Ewing and his Organisation have done for this Association. I have therefore much pleasure in seconding the adoption of the Report.

Die Jaarverslag van die Sekretariaat word eers aanvaar en 'n mosie van deelname met die afsterwe van wyle Mnr. J. C. Fraser word staande aanvaar.

Mnr. P. J. Botes (Roodepoort) spreek die mening uit dat dit nie nodig is om al die referate en verslae te vertaal nie, en sê dat, mits daar 'n behoorlike balans tussen referate in die twee amptelike tale bewaar

The Annual Report of the Secretaries was unanimously adopted and the Convention stood in memory of the late Mr. J. C. Fraser.

Mr. P. J. Botes (Roodepoort) submitted the suggestion that it was unnecessary for all reports and papers to be translated and said that, providing a balance between papers in the two official languages was maintained, there should be no problem and a saving

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in cost to the Association. A lengthy debate ensued, during which it emerged that a major point of contention was the standard of translation in some of the reports and papers which had been undertaken by others than the official translator of the Association.

Apart from Mr. Botes and the President, those taking part in the debate were: Mr. E. de C. Pretorius (Potchefstroom), Mr. G. C. Theron (Vanderbijlpark), Mr. J. K. von Ahlften (Springs), Mr. A. J. Loubser (Kimberley), Mr. C. H. Adams (Somerset West), Mr. E. E. de Villiers (Bloemfontein), Councillor H. Boneschans (Germiston), Alderman W. M. Steer (Salisbury), Mr. M. J. C. Kruger (Port Alfred), Raadslid H. O. Ostro (Heidelberg), Mr. K. G. Robson (East London), Councillor M. Neppe (Johannesburg), Mr. A. J. E. Jurgens (Springs), Councillor J. E. du Plessis (Krugersdorp) and Mr. C. Lombard (Germiston).

At the conclusion of the debate, it was agreed that the matter be referred to the Executive Council for consideration.

The Convention proceeded to consider the Annual Report on the activities of the Physics and Electrical Engineering Department of the S.A. Bureau of Standards, which appeared in Volume (1) of the 1969 Proceedings. In response to discussion, Mr. G. C. Theron (Vanderbijlpark) said:

I would like to point out one thing in connection with the sensitivity of the earth leakage relays. We've got to weigh up the thing up on a practical basis: if we go down to 5 milli-amperes (and it's quite easy to make earth leakage relays with 5 milli-amperes sensitivity) then what are we going to protect — **one** lamp or **one** circuit, but certainly not the whole house or installation.

Mr. G. R. Hain (Alberton) commented as follows:

The question of sensitivity on earth leakage relays: There seems to be quite a bit of confusion about this whole matter. A nominal sensitivity of 20 milli-amperes is virtually safe although it can be lethal even to children. The whole question that arises is the probability of saving a person with say 19 milli-amperes as com-

word, daar geen probleme behoort te wees nie, en dat die Vereniging boonop nog koste kan bespaar. 'n Lang debat volg hierop, waaruit daar blyk dat die gehalte van die vertaalwerk van sommige van die referate en verslae wat deur ander persone as die Vereniging se amptelike vertaler was, een van die belangrikste geskilpunte is. Behalwe Mnr. Botes en die President, neem Mnr. E. de C. Pretorius (Potchefstroom), Mnr. G. C. Theron (Vanderbijlpark), Mnr. J. K. von Ahlften (Springs), Mnr. A. J. Loubser (Kimberley), Mnr. C. H. Adams (Somerset-Wes), Mnr. E. E. de Villiers (Bloemfontein), Raadslid H. Boneschans (Germiston), Raadsheer W. M. Steer (Salisbury), Mnr. M. J. C. Kruger (Port Alfred), Raadslid H. O. Ostro (Heidelberg), Mnr. K. G. Robson (Oos-Londen), Raadslid M. Neppe (Johannesburg), Mnr. A. J. E. Jurgens (Springs), Raadslid J. E. du Plessis (Krugersdorp) en Mnr. C. Lombard (Germiston) aan die debat deel.

Aan die einde van die debat word daar ooreengekoms dat die saak vir oorweging na die Uitvoerende Raad verwys word.

Die Konvensie gaan vervolgens oor tot die oorweging van die Jaarverslag insake die bedrywighede van die Departement Fisika en Elektrotegniese Ingenieurswese van die S.A. Buro van Standaarde, wat in Volume (1) van die Verrigtinge vir 1969 verskyn het. In antwoord op die bespreking sê Mnr. G. C. Theron (Vanderbijlpark):

We must get ourselves clear on this issue: namely, that the idea is to use a relatively acceptable figure and thus protect the whole installation. Otherwise we are not going to achieve anything in this respect because we're going to have so much in the way of nuisance tripping that we'll never be able to convince the public that it is advisable to instal this on a voluntary basis, let alone a compulsory basis.

Mnr. G. R. Hain (Alberton) lewer soos vo'g kommentaar:

pared with 49 milli-amperes, if you go up to 50 milli-amp nominal sensitivity. The most important factor is that of the time of clearing, because if you touch a 200 volt line you are going to get well over a hundred milli-amperes through you.

SECOND DAY

Proceedings began with the presentation by Mr. D. R. Irvine (B.Sc. (Eng.), M.I.E.E., M.Rhod.I.E.), Chief Commercial Engineer of the Rhodesian Electricity Supply Commission, of his paper "The Rhodesia Electricity Supply Commission—A Review of Progress and of Future Trends", which was published in Volume (1) of the 1969 Proceedings.

In thanking Mr. Irvine for his address, the President expressed his appreciation to Mr. J. M. Magowan, General Manager, ESCOM, Rhodesia, for his support.

Mr. E. C. Lynch (Salisbury) proposed a vote of thanks to Mr. Irvine and referred therein to the development of electricity supply in Rhodesia prior to the formation of the Electricity Supply Commission. He also referred to the challenge of how to develop consumption of electricity in African townships, both in Rhodesia and the Republic of South Africa. Dealing with the future of municipal electricity undertakings, he said:

Then we came to what I think is the real "meat" of the paper as far as this Convention is concerned, i.e., that the day of the municipal electricity undertaking is finished and we must all be absorbed in mergers for the benefit of the rest of the consumers. Now the scheme Mr. Irvine has put forward is, of course, the most extreme form of nationalisation. He wants one undertaking to deal with electricity from generation to the final consumer, and claims that that is in the interest of the consumer. He has given a most convincing and able exposition of that case. I do think, however, that we need to be very cautious before we swallow it, hook, line and sinker!

I believe that the municipal type of electricity set-up had much to offer and still has much to offer. It is the only method I know whereby the ordinary consumer, through his elected representative, can have any effective say in the supply of electricity to him. The author pointed out that the consumer was the prime person to be considered. I agree 100%, but why are the Commission so determined that there will be no representation of the consumer through his elected representatives on those bodies? Mr. Leishman told us that the answer was a firm "NO" when suggestions

On the subject of the Commission's experience in African Townships he said:

It is, I think, one of the most challenging tasks facing us in this country and in South Africa—how we are going to get electricity used in these townships—and it is certainly a frustrating task. The experience

TWEEDE DAG

Die verrigtinge begin met die lewering deur Mnr. D. R. Irvine, B.Sc. (Ing.), L.I.E.I., L. Rhod.I.E., Hoof-Handelsingenieur van die Rhodesiese Elektriesiteitsvoorsieningskommissie, van sy referaat onder die opskrif „Die Rhodesiese Elektriesiteitsvoorsieningskommissie — 'n Oorsig van Vooruitgang en van Toekomstige Tendense“, wat in Volume (1) van die Verrigtinge vir 1969 gepubliseer is.

Toe hy Mnr. Irvine vir sy referaat bedank, spreek die President ook sy waardering uit tenoor Mnr. J. M. Magowan, Hoofbestuurder van die Rhodesiese Evkom, vir sy ondersteuning.

Mnr. E. C. Lynch (Salisbury) stel 'n mosie van dank aan Mnr. Irvine voor, waarin hy verwys na die ontwikkeling van die kragvoorsieningsbedryf in Rhodesië voor die totstandkoming van die Elektriesiteitsvoorsieningskommissie. Hy verwys ook na die uitdaging van hoe om die verbruik van krag in Bantoe-woongebiede, sowel in Rhodesië as die Republiek van S.A., te bevorder. Met verwysing na die toekoms van munisipale elektriesiteitsondernemings, sê hy:

were made in the South for absorption and the local authorities asked for a say on the direction of the Commission. The same thing happened here: Salisbury Council, I think, made a most enlightened attempt to examine whether there could be a case for voluntary amalgamation with the Commission and was one of the big stumbling blocks—the Council wanted to have some say. It was putting an enormous investment, shall I say, into the Commission—a £25,000,000 undertaking with a loan deficit of about £12,000,000. Of course the Council would have merely had its loan debt obligations removed, so it was in effect making a gift of £12,000,000 or more of assets and for that £12,000,000 it asked little more than a say to represent its consumers in the future Commission, which would have been nearly twice the size of its present undertaking. But there does seem to be this rooted objection to the local authorities having any say in the Commission; and I do believe that the local authorities are the best representatives of the ordinary small consumer—the domestic consumer and the industrialist, of which there are many hundreds for every large consumer and mine.

Wat die Kommissie se ondervinding is Bantoe-dorpe betref, sê hy:

in Salisbury has been that a 1 amp and a 5 amp load limited supply should be used for the normal domestic dwelling of the African who cannot afford the normal domestic supply. Today the African cannot afford

electricity for cooking. It may come later on and then of course he can take up the standard domestic tariff. I don't think there is any justification for a whole series of load limiters, building up 1 amp, 2 amps and so on up to 15 amps as has been adopted by some local authorities.

Certainly our experience has been that for a 5 amp load limiter you are going to sell about 250 units per month and on a 1 amp load limiter, about 50 units per month. That is the experience in Salisbury supplying something like 10,000 or more African houses with load limiters.

I find it rather difficult to interpret Mr. Irvine's figures where he speaks of only connecting 40% and so on, of the houses; but we're not told the number of houses or the proportion of these which are wired. Now in Salisbury we have found that the new houses are just not being wired; we're moving backwards fast. A few years ago all of the houses were wired, now none are being wired and I think we're getting our priorities wrong there. We're spending enormous sums of money promoting the sale of African beer —

The vote of thanks was seconded by Mr. R. S. Dunstan (Port Elizabeth). Referring to the utilisation of wooden poles with unearthed metalwork, he stated that he considered insufficient advantage had been taken thereof in view of the fact that, when utilised, a great deal of lightning faulting was eliminated. Mr. Dunstan referred to the historical background of electricity supply and urged the Electricity Supply Commissions in both the Republic and Rhodesia to disclose all relevant information at all times. It was his opinion that this did not always take place. He considered there were dangers in supply commissions being granted monopolies and in the field of distribution he could see no reason whatsoever to justify the claim that in Rhodesia the Commission should take over the whole retailing of electricity.

Ratepayers, through their Councils, were in his opinion, entitled to express definite opinions on the provision of their electricity supplies and the financial impact of the removal of electricity supply from municipalities would be far reaching. He expressed doubt concerning the desirability of the decision in the Republic of South Africa for ESCOM to become the sole generator of electricity. These doubts he based on economic and strategic considerations.

Contributors to the discussion on the paper were:

Mr. K. A. H. Adams (Johannesburg), who referred to some of the dangers implicit in rationalisation to the extent of exclusive monopolies.

Mr. E. E. de Villiers (Bloemfontein), who re-

ferred to the money is there, but somehow it is not being used for electricity; and I think electricity should in some way be given a higher priority.

Probably a measure of subsidy in the early days is necessary and I think the source of that subsidy must be from the electricity revenues of other consumers. It's no good expecting to get very much out of the rate fund, the beer fund and so on. We can hope for it but the only assured source I think is within the electricity undertakings revenue. After all, that is how we have developed our other loads and we have to develop this one, if it is to be developed at all, from electricity revenues.

I couldn't quite follow how the scheme in Gatooma works. Apparently the profits from electricity were put into a revolving fund which was used to wire more houses in the township. Then it was pointed out that 20 units worth of supply for 10s. for which you have to read the meter, send in an account and so on would cost you more than 10s., so I couldn't quite see where the profit came from that you were going to wire some more houses with the revolving fund.

Die mosie van dank word gesekondeer deur Mnr. R. S. Dunstan (Port Elizabeth). Met verwysing na die gebruik van houtpale met metaalwerk wat nie geaard is nie, spreek hy die mening uit dat daar nie genoegsame gebruik hiervan gemaak is nie, aangesien die gebruik daarvan 'n groot mate van foute wat aan weerlig te wyte is, uitkakel. Mnr. Dunstan verwys na die geskiedkundige agtergrond van die kragvoorsienningsbedryf en doen 'n beroep op die Elektrisiteitsvoorsienningskommissie in sowel die Republiek as Rhodesië om ten alle tye alle tersaaklike inligting vry te stel. Na sy mening word dit nie altyd gedoen nie. Hy is van mening dat daar gevare skuil in die toekenning van monopolieë aan voorsienningskommissies, en sover dit distribusie betref, kan hy geen rede vind om die eise te regverdig dat die Kommissie die hele kleinmaatverkopings van elektrisiteit in Rhodesië moet oorneem nie.

Volgens sy mening is belastingbetalers, deur middel van hulle Rade, daarop geregtig om beslisse menings te lug omtrent die verskaffing van elektrisiteit aan hulle, en indien die verspreiding van elektrisiteit van munisipaliteite af weggenem sou word, sal die finansiële uitwerking van so 'n stap vérreikend van aard wees. Hy spreek sy bedenkinge uit teen die wenslikheid van die besluit dat EVKOM die enigste liggaam vir die opwekking van krag in die Republiek van S.A. moet word. Hy grond hierdie bedenkinge op ekonomiese en strategiese oorwegings.

Die volgende persone lewer bydraes tot die bespreking oor die referaat:

Mnr. K. A. H. Adams (Johannesburg) wat verwys na sekere van die gevare wat ingehou word deur so 'n mate van rasionalisasie dat dit op 'n uitsluitlike

quested clarification of the frequencies utilised for VHF radio communication. Referring to demand tariffs, Mr. de Villiers said that with the two-part tariff system there might also be a double penalty for a contravention. He asked for confirmation as to whether 810,000 units per employee did not include generation personnel.

Referring to non-Europeans township supplies, he said:

The figure that was given to us by the speaker from Salisbury: that they found that using a 1 amp load limiter 50 units were used monthly and 5 ampere which is five times higher, they have a five times

Mr. L. J. Hooley, Ministry of Transport and Power (Salisbury) made the point that the supply of electricity, whether in the hands of the local authority or ESCOM, was still a monopoly. Referring to the supply of electricity by Councils to areas outside the municipal area, he reminded the Convention that in these instances surcharges of standard tariffs applied.

Mr. J. N. Jones (Bulawayo) paid tribute to the work done by ESCOM in Rhodesia, but at the same time referred to the contribution of municipal undertakings. He did not favour the Commission becoming the sole distributor and stressed the fact that under these circumstances the consumer would be at a disability in many instances due to remoteness from the centre of administration of the system.

2nd Day, AFTERNOON SESSION

Mr. J. D. N. van Wyk presented his paper "Computer Engineering" which was published in Volume (1) of the 1969 Proceedings. Having dealt with his paper, Mr. van Wyk then presented to the Convention a film entitled "Man and Computer — a Perspective" by I.B.M. At the conclusion, the President said:

Thank you, Mr. van Wyk: that was a most frightening and disturbing depiction of the future in computer engineering. It must surely be today the most advanced science in the world; possibly other than

In formally thanking Mr. van Wyk, Mr. E. de C. Pretorius (Potchefstroom) said:

As I have no knowledge of the subject I shall

alleenreg neerkom.

Mnr. E. E. de Villiers (Bloemfontein) wat om 'n verduideliking vra met betrekking tot die frekwensies wat vir BHF-radioverbinding gebruik word.

Met verwysing na aanvrag-tariewe, sê Mnr. de Villiers dat dit, by die toepassing van die dubbeltariefstelsel, kan gebeur dat 'n dubbele straf vir 'n enkele oorteding opgelê word. Hy vra ook of die syfer van 810,000 eenhede per werknemer die opwekkingspersoneel insluit of nie. Met verwysing na kragverskaffing aan Bantoewoongebiede, sê Mnr. de Villiers:

higher use per month. By quick calculation this works out to a load factor of 51.5%, which I feel is perhaps a little bit on the high side. I would have anticipated it much lower.

Mnr. L. J. Hooley van die Ministerie van Vervoer en Krag (Salisbury) spreek die mening uit dat verskaffing van elektrisiteit in ieder geval 'n monopolie is, afgesien daarvan of dit in die hande van die plaaslike bestuur of Evkom is. Met verwysing na die verskaffing van elektrisiteit deur Stadsrade aan gebiede buite die munisipale grense herinner hy die Konvensie daaraan dat daar in sulke gevalle bykomstige heffings by die standaard-tariewe gevoeg word.

Mnr. J. N. Jones (Bulawayo) loof die werk wat deur die Rhodesiese Evkom in daardie land gedoen is, dog verwys terselfdertyd na die bydrae van munisipale ondernemings. Hy is nie ten gunste daarvan dat die Kommissie die enigste verspreider van krag moet word nie en lê klem op die feit dat die verbruiker onder sulke omstandighede in baie gevalle benadeel sal word deur die feit dat hulle so ver van die sentrum van die administrasie van die stelsel af geleë is.

2de Dag, NAMIDDAGSITTING

Mnr. J. D. N. van Wyk lewer sy referaat onder die titel "Reken-outomaatige/eurswese", wat in Volume 1 van die Verrigtinge vir 1969 gepubliseer is. Nadat hy die referaat behandel het, toon Mnr. van Wyk aan die Konvensie 'n film getiteld „Die Mens en die Rekenaar — 'n Perspektief" deur I.B.M.

Hierop sê die President:

nuclear science, by far the most advanced mathematical science. You are most certainly a born lecturer. Mr. van Wyk, and I must thank you sincerely for all the trouble you have taken.

Toe hy Mnr. van Wyk formeel bedank, sê Mnr. E. de C. Pretorius (Potchefstroom):

rather revert to what I know about the author.

Soos u gelees het, Mnr. die President, dame en here, is Mnr. van Wyk tans Assistent-direkteur van die Nasionale Navorsingsinstituut vir Wiskundige Wetenskappe. Hy is verantwoordelik vir navorsing op die gebied van elektriese ingenieurs by WNNR. Hy het in 1949 gegradueer aan die Universiteit van Kaapstad in die Elektrotegniese Ingenieurswese met lof (dié is seker vanselfsprekend); hy het die pos van Assistent-navorsingsbeampte aanvaar by die WNNR in Januarie 1950; hy verwerf daarna die UNESCO-beurs vir nagraadse studie in die buiteland en bring 1953 by die Chalmers-instituut vir Tegnologie in Gothenberg, Swede deur; hy werk daar onder Prof. Wallman aan die ontwikkeling van analoogrekenaars. By sy terugkeer in Suid-Afrika ontwikkel hy die analoogrekenaar (Heiden) by die WNNR wat tot 1968 nog in gebruik was. In 1957 is hy een van 'n tweeman-sending om syferrekenaars te ondersoek en aanbevelings in verband met die WNNR se eerste syferrekenaar te doen. Hy het verskeie verdere oorsese reise onderneem gedurende 1964, 1966, 1967 namens die WNNR om veral aadag aan outomatisasie te skenk. Hy is senior lid van die Ingenieursgenootskap van Suid-Afrika en was President van hierdie organisasie gedurende 1963; hy

Referring to maintenance, Mr. Pretorius wondered whether there would be sufficient competent maintenance personnel in the future.

The vote of thanks was seconded by Mr. E. E. de Villiers (Bloemfontein).

In discussion on the paper, Mr. E. A. McWilliam (Pretoria) referred to the power supply to computers. Here there were problems which municipal electrical engineers would have to face in the near future. As an example, he referred to problems with the municipal computer in Pretoria, arising from high starting currents absorbed by the air conditioning plant in the new Munitoria building, "spikes" in the voltage wave as well as frequency difficulties. It had been decided to install a 40kW synchronous motor generator set with fly wheels and sophisticated voltage regulation equipment.

In response, Mr. van Wyk thanked the speakers for their kind words and referring to the problem facing municipal electrical engineers, said:

Mr. McWilliam, the point you mentioned of course is not only becoming a headache for the power engineer as far as computers are concerned, but this business of "spikes" which do exist on power supplies, is something which is becoming an even greater nuisance, because in the power engineering field semiconductors are already finding their application, and very often we find that these devices die and we don't know what the reason is for this. This is because of the very

is lid van die Uitvoerende Komitee van die Suid-Afrikaanse Raad vir Outomatisasie en Berekening (SAROB) en was President van hierdie liggaam vanaf 1965 tot 1967; hy is voorsitter van 'n komitee van SAROB in verband met toekomstige beplanning van outomatisasie in die Republiek van Suid-Afrika; hy is lid van die Toepassingskomitee van IFAC (International Federation for Automatic Control); lid van die Suid-Afrikaanse Instituut vir Elektriese Ingenieurs en fakultetslid van die afdeling Natuurwetenskap en Tegniek van die Suid-Afrikaanse Akademie vir Wetenskap en Kuns.

U sal met my saamstem dat ons referent se **curriculum vitae** ondubbelsinnig spreek van sy uitnemende bekwaamheid en bevoegdheid. Ons kan self, as die VMEQ, besonder gelukkig en bevoorreg ag dat 'n persoon van Mnr. van Wyk se kaliber hom nog verwerdig om ons klomp pre-transistoriese (amper sê ek pre-historiese) swaarstroom-elektrotegniese ingenieurs te probeer inlei in die geheimnisse van die mistieke.

Ek weet nie waar Mnr. van Wyk gebore is nie: ek neem in die Vrystaat, want dis mos die bakermat van al ons uitstaande persoonlikede! (Ek is ook daar gebore!)

Met verwysing na instandhouding, sê Mnr. Pretorius dat hy wonder of daar in die toekoms 'n genoegsame bevoegde instandhoudingspersoneel sal wees.

Die mosie van dank word deur Mnr. E. E. de Villiers (Blomfontein) gesekondeer.

Tydens die bespreking van die referaat verwys Mnr. E. A. McWilliam (Pretoria) na die kwessie van kragvoorsiening aan reken-automate. Op hierdie gebied is daar probleme wat munisipale elektrotegniese ingenieurs binnekort in die gesig sal moet staar. As voorbeeld verwys hy na die probleme met die munisipale rekenaar in Pretoria, wat veroorsaak is deur die hoë aansitstroom van die lugversorgingsmasjinerie in die nuwe Munitoria-gebou, „skerp punte” in die spanningsgolf en frekwensieprobleme. Daar is besluit om 'n gesinchroniseerde motor-opwekkingseenheid van 40 K.W. met vliegwielen en gesofistikeerde spanningsreëlaars te installeer.

Toe hy op die bespreking antwoord, bedank Mnr. van Wyk die sprekers vir hul vriendelike woorde en met verwysing na die probleme waarvoor munisipale elektrotegniese ingenieur te staan kom, sê hy:

speed with which the semiconductor devices can switch. It means that spikes which may last only for a micro-second or so, are sufficiently potent to destroy these devices; and there are not many oscilloscopes or measuring devices available generally to the power engineer who could pick these up. They are particularly noticeable in the computer industry, where one little spike, as you can imagine, one little binary digit wrong in a million, can give you sort of three answers

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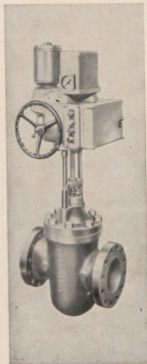
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wrong every micro-second. There they are particularly potent but they are becoming very much more important also, and I think this will mean that the power engineer will have to familiarise himself with the origin of these spikes if it's not quite known where they come from; and something will have to be done.

From the computer side, matters have improved quite considerably: the computer designers are able to put in buffer circuits in the regulated power supplies to get rid of most of these spikes, though, of course, not all of them. This is, however, something that requires quite a lot of design and research work at the present moment.

The question of **voltage variations**: already there I think we have relaxed the requirements in computers very much. Beforehand we had to have a very strict 1% or 2% variation up and down but already now

one can allow much greater tolerances. The same for **frequency**: the frequency really comes in when one has devices such as magnetic tapes where the inertia of the device is small because you want to get it up to speed very quickly: it's usually run in a synchronous mode and a change of the frequency can, in fact, upset it. But, here again, this has been alleviated to a certain extent in the modern computers, although there is the trend now to increase the packing density. This means that you're writing bits of characters across the tape where it used to be 200 to the inch, we're now talking about 800 to the inch, and even 1600 to the inch. You can well imagine that if the thing gets out of step just a little bit, it reads incorrectly. This is a very difficult problem: some computer manufacturers therefore ask for a buffer unit to be installed between the mains, but I think, by and large, this is not necessary any longer.

THIRD DAY

MORNING SESSION

Mr. Rowan Martin, O.B.E., B. Com., F.I.M.T.A., A.C.W.A., F.C.I.S., City Treasurer, Salisbury, presented his paper on "Financial Autonomy", which was published in Volume (1) of the 1969 Proceedings.

Councillor F. Jeffs (Umtali) proposed the vote of thanks to Mr. Martin. Commenting on paragraph 32, he said that the definition could not be accepted because in the case of capital development funds, repayment of both capital and interest would result in the expenditure of approximately double the amount originally borrowed. Whilst agreeing with the principles of sound finance, he could see no reason why a council should have to pay interest on its own money. He continued:

Whereas revenue contributions to capital outlay means the capital works but not with debitible interest at all, a redemption only could be established whereby over a given period of years sufficient funds would be accumulated to replace the asset; in other words, a single debit and not a double one. Thus there would be greater profit within the undertaking by rev-

Referring to Section 234 of Ordinance No. 10 of 1953, he suggested that this was completely out of date because of the variation of interest rates—at that time in the region of 3%—3½% on long term loans. On the question of government legislation he said:

DERDE DAG

OGGENDSITTING

Mnr. Rowan Martin, O.B.E., B. Com., G.I.M.T.R., G.K.W.R., G.G.I.S., Stadesourier, Salisbury, lewer sy referaat getitel „Finansiële Outonomie“, wat in Volume I van die Verrigtinge vir 1969 gepubliseer is.

Raadslid F. Jeffs (Umtali) stel 'n mosie van dank aan Mnr. Martin voor. Met verwysing na paragraaf 32 sê hy dat die definisie nie aanvaarbaar is nie, aangesien in die geval van kapitaalontwikkelingsfondse, die terugbetaling van sowel kapitaal as rente tot gevolg sal hê hy dat byna dubbeld soveel geld as wat oorspronklik geleen is, terugbetaal sal moet word. Alhoewel hy met die beginsels van gesonde finansiëring saamstem, kan hy geen rede vind waarom 'n Raad rente op sy eie geld moet betaal nie. Hy gaan voort deur te sê:

enue contributions to capital outlay through there being no interest charge.

I refer now to paragraph 34: Should the policy of revenue contributions on such a basis as I have explained, be accepted, then every decade would benefit, and not any particular decade as outlined by the author.

Hy verwys na Artikel 234 van Ordonnansie No. 10 van 1953 en voer aan dat dit heeltemal verouderd is weens die wisseling van rentekoerse—destyds tussen 3% en 3½% op langtermynlenings. Wat betref wetgewing deur die Regering sê hy:

Let it be remembered that it's the ratepayer who foots the bill and it should be the ratepayer who receives some benefit from successful operations, in unison with trading without government interference. It could be said that national governments interfere too much already in local government affairs: the national

In seconding the vote of thanks, Mr. R. M. O. Simpson (Durban) referred to the mention of "Durban" and said:

Our trading undertakings are required to contribute a certain percentage in aid of rates from the gross revenues of the undertaking. The last speaker that proposed it, I don't think understands exactly what their position is, because we do pay from 2%—4%; we can't pay less, by law, and normally not more than 4%; but this is 4% of the gross loan debt of

Mr. Simpson supported the plea in the paper for the generation of interest-free capital. In relation to electricity tariffs, he stated that, from the experience in Durban, it appeared that the demand for electricity is more elastic than is generally recognised and that, accordingly, care must be taken not to load the consumer to such an extent as to discourage consumption.

The President called for contributions to discussion on both Mr. Irvine's and Mr. Martin's papers.

Dealing with both papers, Mr. R. Leishman (Johannesburg) referred to the establishment by Johannesburg of a consolidated loans fund in 1952. This has operated satisfactorily and the rate of interest from the fund, which over the years had ironed out the peaks and troughs in interest rates, had, until this year, been below 5%, with the public rate standing at 7%.

Mr. Leishman said that the fight between the Municipality and ESCOM had not been for the sake of having power stations, but because of the interference in the finances of his city by ESCOM. The Council had operated a capital development fund and a tariff stabilisation fund—the latter closed off because it had become saturated. The system of finance adopted by Johannesburg had placed it in a position at the present time, to find, for instance, just under half the amount of capital required for a new power station project without going to the public at all. Mr. Leishman said that it was interference in this mode of finance which has worried his municipality. He continued by saying that the Council's policy was that 40% of the profit of the Electricity Department was

government should offer guidance. To too much legislation I say no. Governments and some statutory bodies might do well to consider the example of sound finance as practised at some of the municipalities.

Mnr. R. M. O. Simpson (Durban) sekondeer die mosie van dank en in verband met die verwysing na „Durban" in die referaat sê hy:

the undertaking. If you relate that to a percentage of your annual revenue, it's in the region of 10%. I think that covers the particular point made by the last speaker but I'd like to mention that this provision dates from a 1913 Ordinance which, with the passage of time, has acquired the patina of the Law of the Medes and Persians and no one is anxious to meddle with this relic of the wisdom of the ancients!

Mnr. Simpson steun die voorstel in die referaat omtrent die daarstelling van rentevrye kapitaal. Met verwysing na elektrisiteitstariewe sê hy dat dit uit die ondervinding in Durban gebyk het dat die vraag na elektrisiteit meer elasties is as wat algemeen aanvaar is en dat mens dus versigtig moet wees om nie die verbruiker dermate te belas dat verbruik daardeur ontmoedig word nie.

Die President gee verdere geleentheid vir bespreking van sowel Mnr. Irvine se referaat as Mnr. Martin s'n.

Mnr. Leishman (Johannesburg) behandel albei referate en verwys na die stigting van 'n gekonsolideerde leningsfonds deur Johannesburg in 1952. Hierdie fonds het bevredigend gefunksioneer en die rentekoers van die fonds, wat meegehelp het om die stygings en dalings in rentekoerse deur die jare gelyk te stryk, was tot vanjaar laer as 5%, terwyl die koers in die openbare sektor op 7% gestaan het.

Mnr. Leishman sê dat die stryd tussen die Munisipaliteit en Evkom nie oor die kwessie van die besit van kragentrales gegaan het nie, dog wel oor die inmenging deur Evkom in die finansies van sy stad. Die Raad het sowel 'n kapitaalontwikkelingsfonds as 'n fonds ter stabilisasie van tariewe in die lewe geroep—laasgenoemde is reeds afgesluit omdat dit versadig geraak het. Die finansieringsmetodes wat deur Johannesburg toegepas is, het hom in die huidige stadium in staat gestel om bv. net minder as die helfte van die kapitaalbedrag wat vir die bou van 'n nuwe kragentrale nodig is, te vind sonder om hoegenaamd die publiek te nader. Mnr. Leishman sê dat dit die inmenging in hierdie finansieringsmetodes is waaroor sy Raad bekommerd voel. Hy gaan voort deur te sê dat dit sy Raad se beleid is om 40% van die winste van die Elektrisiteitsdepartement ter verligting van belastinge aan te wend. 36% word gestort in die kapitaalont-

appropriated to the relief of rates. 36% was appropriated to the capital development fund earmarked for the Electricity Department, but on which the ruling consolidated loans fund interest and redemption rates were payable, and the remaining 24% was given as a capital donation ex surplus. This system gave the incentive to the employees of the Department to know that such economies as they might make could find their way into profits, a quarter of which could be for capital for the Department's use. In conclusion, Mr. Leishman said:

These are the things that have been built up in local authority finance and have not been built up, so far as I know, in the finance programmes of Electricity Supply Commissions. It is my understanding, and I'm open to correction, that when an Electricity Supply Commission wishes to go on a new capital project it has necessarily to go out on the market because it's enjoined to operate at neither a profit nor loss; it has not been able to build up these capital funds and therefore it has to go to the market at the ruling rate of interest. A lot of our objection today is the very **high** rate of interest at which such very large capital projects are being engaged upon.

Mr. K. G. Robson (East London), referring to Mr. Martin's paper, asked for the author's views on whether the meaningless phrase "cheap power" had not brought about wastage of electricity and the uncontrolled rate of load growth. He also asked whether the tremendous capital expenditure being put into generating and distribution plants was reasonable in relation to overall national economy.

He next asked for elaboration by Mr. Irvine of his description of the lattice tower which had a collapsible section in the cross arm. Secondly, how long it was before supplies were restored on the main transmission line in the primary distribution circuits and how many circuits had to fail before there was a partial loss of supply.

Next, he asked for details of the block type of tariff where block unit consumption figures were used in the tariffs.

Finally, he said:

Something that disturbs me is the fact that we, as electricity undertakings, are perhaps not doing enough to attract young engineers to this very interesting career. I think we have neglected our opportunities both in South Africa and (it appears from Mr. Irvine's paper) in Rhodesia by creating the false impression that it is only in taking jobs in the huge combines like ESCOM and the ESC that there is any future for engineers. I notice that Mr. Irvine particu-

wikkelingsfonds wat vir die Elektrisiteitsdepartement opgesit is, dog waarop die heersende rente — en delgingskoerse van die gekonsolideerde leningsfonds betaalbaar is, terwyl die oorblywende 24% as 'n kapitale skenking uit surplusfondse behandel is. Hierdie stelsel gee 'n aansporing aan die werknemers van die Departement insoverre dat hulle weet dat enige besparings wat hulle teweegbring, deel vorm van die winste, waarvan een-kwart in die vorm van kapitaal na die Departement terugkom vir sy eie gebruik. Ten slotte sê Mnr. Leishman:

In short: a local authority is a very large business, in many cases the largest business in the town in which it is situated. If it's a business run on behalf of its ratepayers, it is obvious that it has to have some trading undertakings from which it makes profits, in order to offset these very large projects of amenity in the way of parks, halls like this, roadways and such like, which do not give a revenue return; and I feel that it is a great pity that the day is coming when we are going to have so much interference from external sources that we are going to break this machine down. I feel that we need to find the way of sustaining this machine.

Mnr. K. G. Robson (Oos-Londen) verwys na Mnr. Martin se referaat en vra die referent om sy mening te gee oor die vraag of die betekenislose uitdrukking „goedkoop krag" nie tot die vermorsing van elektrisiteit en 'n onbeheerde groei koers van die belasting van elektrisiteitstelsels gelei het nie. Hy vra ook of die gewelddige groot kapitale uitgawes wat in opwekkings- en verspreidingsinstallasies ingeploeg word, redelik is in vergelyking met die breë nasionale ekonomie.

Voortgaande vra hy Mnr. Irvine sy beskrywing van die traliewerk toring met 'n opvoubare gedeelte in die dwars-arm, verder toe te lig. Tweedens vra hy hoe lank dit duur voordat die toevoer herstel word na onderbrekings in die hoof-toevoerlyn en die primêre verspreidingsstroombane en hoeveel stroombane moet inge voer word daar 'n gedeeltelike onderbreking van die toevoer voorkom.

Laastens vra hy besonderhede van die blok-tipe tarief waar blok-eenheidsverbruiksyfers in die tariewe gebruik word. Ten slotte sê hy:

larly stressed this as being the only possible satisfying avenue for engineers. I think it would be most unfortunate if this were to gain prevalence and as municipal electrical engineers we shall have to do all we can to counteract this and to do now some of the things that should have been done years ago. I would, however, just like to underline that I do believe it's a very dangerous phrase, certainly for those in electricity undertakings.

Alderman W. M. Steer (Salisbury) said that Mr. Martin had made a case for the conversion of municipal electricity undertakings into utility companies. He referred to the cumbersome procedure under the municipal committee system and continued:

The question must be raised as the legality of taking money from an undertaking to subsidise rates — particularly in Rhodesia where it is said to be controlled by an Electricity Council. If, however, we turned our undertaking into a utility company retaining 51% of the shares, we should then be entitled legally and honourably to take from that undertaking whatever our shares in that undertaking have earned. It would then mean that our electrical engineers would have a clear field with only a very small board who would be autonomous and could deal with the problems as they arise.

When one thinks that an undertaking, say the size of Salisbury, could be put on the market and I say with an actuarial valuation plus the increase in the value of shares when put on as a monopoly concern on the stock market, we would have several million pounds to put into the exchequer, of the city's funds. What I'm afraid of is the danger of nationalisation, when what the ratepayer has built up will be

Referring to Mr. Irvine's paper, Alderman Steer made the point that there were no longer Town Management Boards in the Salisbury district — they are now all Town Councils. He also stated that with regard to the surcharge applicable to neighbouring local authorities, these were being eliminated as the capital cost and capital responsibilities of taking the electricity to them diminished. He continued by referring to dangers which he considered existed as a result of nationalisation and said that Salisbury had endeavoured to come to an agreement with ESCOM, but this has not proved possible. He felt that electricity organisations should be run on a strictly commercial basis.

Mr. P. J. Botes (Roodepoort) referred to the good relations which existed between local authorities and ESCOM in the Republic of South Africa and regretted certain statements which had been made which might have indicated a different situation.

Mr. L. G. Richardson (Mbabane) stated that in West Africa, where he was previously, the status symbol factor of electricity amongst Africans sold the commodity. He thought that lack of growth of consumption amongst Africans might in some way be the result of the wrong psychological approach in selling. Referring to the fact that most capital utilised by the Swaziland Electricity Board was by way of loans from

Raadsheer W. M. Steer (Salisbury), sê dat Mnr. Martin 'n goeie pleidooi gelewer het vir die omskepning van munisipale elektrisiteitsondernemings in nutsmaatskappye. Hy verwys na die lompe prosedures wat deur die munisipale komiteestelsel meegebring word en gaan voort deur te sê:

taken over at nil valuation for the ratepayers and the councillors who have put years of service into the building up of an undertaking.

Mr. Leishman said that they had been able to pay for their generators on the turn but is that an advantage to the people who have paid on them? These generators, I take it, are for life. Our Treasurer said that it was fair to say that the people who are going to enjoy the amenities should pay for them, but it seems to me that if we continue excessively building up these reserves, it is the people of today who are paying for what our grandchildren are going to do; and with events in the world today how can we look into the future; how can we say who is going to enjoy the benefits of these masses of reserves which the present day ratepayer is putting away?

I would put this food for thought: "Is it necessary to build reserves for a business which cannot go bankrupt?" If we are going to apply methods, then let us go whole-heartedly to our business.

Met verwysing na Mnr. Irvine se referaat, wys Raadsheer Steer daarop dat daar nie meer Dorpsbestuursrade in Rhodesië is nie — hulle is nou almal Stadsrade. In verband met die toeslag wat op naburige plaaslike besture van toepassing is, sê hy dat hierdie toeslag algaande uitgeskakel word namate die kapitale koste en die kapitale aanspreeklikheid van die toevoer van krag na hulle afneem. Hy gaan voort deur te verwys na die gevare wat na sy mening deur nasionalisasie meegebring word en sê dat Salisbury probeer het om tot 'n ooreenkoms met Evkom te geraak, dog dat dit nie moontlik gebyk het nie. Hy is die mening toegedaan dat elektrisiteitsondernemings op 'n streng kommersiële grondslag bestuur behoort te word.

Mnr. P. J. Botes (Roodepoort) verwys na die goeie verhoudinge wat daar tussen plaaslike besture en Evkom in die Republiek van S.A. bestaan en spreek sy spyt uit oor die feit dat sekere stellings gemaak is wat daarop mag dui dat dit nie so is nie.

Mnr. L. G. Richardson (Mbabane) sê dat in Wes-Afrika, waar hy vroeër was, dit die statussimbool-aspek van elektrisiteit onder die Bantoes was wat die verkope van hierdie kommoditeit gestimuleer het. Hy spreek die mening uit dat die geringe vermeerdering van die verbruiksgroei koers onder Bantoes miskien die gevolg mag wees van die verkeerde sielkundige benadering met betrekking tot verkoopstegniese. Met verwysing na die feit dat die grootste gedeelte van die kapitaal wat deur die Swasilandse Elektrisiteitsraad

the World Bank, he said that organisation were essentially bankers and they made sure that those to whom they lent money would be in a position to repay it. He said that in Swaziland the approach was one of straight forward finance from a business point of view without the complication of funds related to other aspects of local authority operation being involved.

Mr. E. C. Lynch (Salisbury) contributed to the discussion on Mr. Martin's paper.

Mr. C. Lombard (Germiston), commenting on Mr. Irvine's paper, said:

I was very interested in the remarks in Mr. Irvine's paper concerning the use of auto-disconnects with load brake contacts. By this I presume he means rupture heads. There's no doubt that important economies can be achieved by the judicious application of

Mr. Jan H. Smith (ESCOM, Johannesburg) conveyed greetings from the Chairman and General Manager of ESCOM and referred to the pleasure it was for the representatives of ESCOM to attend the conventions of the A.M.E.U. He referred to financial problems which had been discussed and said:

The crux of the matter is, of course, that we all like to produce money from nowhere in order to finance the big expansion programmes we all have in mind and that we would all like to see; because South Africa and Rhodesia are countries that are developing fast and continually growing and that is the way it should be. We do, however, need terrific amounts of capital and the only way we can get capital is to raise it. All these other methods, call them whatever you like, I do not think it's really a forum here for discussion about what money is worth. After all, the money that was referred to this morning (that's worth about 5%) I feel part of that belongs as much to me as to a man who is supplied with his electricity by a monopoly, the City Engineer of Johannesburg! I feel that I am hard done by if that money cannot do more for me than that, because I can do better outside. Someone has just mentioned that even the 7½% return isn't good enough, and now I am told that it has got to earn less. That seems wrong to me but, Mr. President, I do not wish to venture into that field again because that is the field of specialists.

Certain facts I think we should be quite clear about: firstly, I believe the purpose of this session is to discuss two papers—the paper by Mr. Irvine and the paper by Mr. Martin—and not sort of recapping what is virtually past history. Now of course I do not know to what extent the delegates present here are aware of the history, but a few facts stand out very

bestee word, uit lenings van die Wêreldbank afkomstig is, sê hy dat daardie organisasie in die eerste plek 'n bankier is en dat hy moet seker maak dat diegene aan wie hy geld leen, in staat moet wees om dit terug te betaal. Hy sê dat sake in Swasiland streng as finansiering, vanuit 'n sake-oogpunt gesien, benader word, sonder die komplikasies verbonde aan gelde wat met ander aspekte van die bestuur van plaaslike owerhede in verband staan.

Mnr. E. E. Lynch (Salisbury) lewer ook 'n bydrae tot die bespreking van Mnr. Martin se referaat.

In sy kommentaar op Mnr. Irvine se referaat, sê Mnr. C. Lombard (Germiston):

these rupture heads. There's just one snag and that is, their life is fairly limited and depends on the number of operations, as well as the loads interrupted. I would like to ask how and at what stage does Mr. Irvine's organisation decide to replace them.

Mr. Jan H. Smith (Eskom, Johannesburg) dra die groete van die Voorsitter en die Algemene Bestuurder van Eskom oor en sê dat dit vir die verteenwoordigers van Eskom baie aangenaam is om die Konvensies van die V.M.E.O. by te woon.

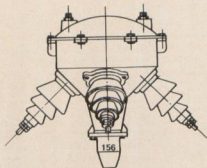
Hy verwys na die finansiële probleme wat bespreek is en sê:

clearly, and that is that it will be completely contrary to the development of the entire Western World (and more than the Western World only) if generation is not centralised—the operation of generation. What you do with the finances and that sort of thing is a separate matter entirely and is for the financial people to see to. The days of small isolated pockets of local generation are uneconomic by present standards and can not be continued at all. The position there is quite clear and bears no further discussion.

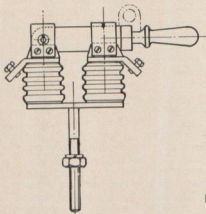
Other points which have been raised here are related to this particular aspect to a certain degree. What must be borne in mind though, is that I myself, of course, have no knowledge whatsoever as to what rates of interest are going to do in the future. If you have a large amount of money on hand now, whatever way you have come by it, whether you have obtained it from some other means, probably collecting it in the past by over-charging or "fiddling the accounts" (as somebody put it) but basically you must bear in mind that, where you are doubling your development in a period of nine years or less, you need a terrific amount of new capital. If the interest rates remain roughly as they are now, you can understand very soon that your average rate will be approaching your present rate. All these other methods by which it is said you can get "cheaper" money we would dearly like to believe, but I am wondering if this is not merely the Constable van der Merwe solution, Mr. President

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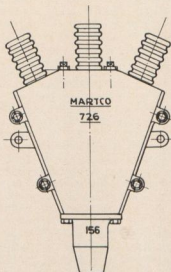
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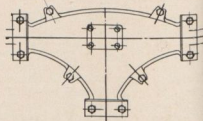
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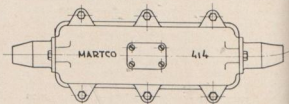
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— with all due respect. It seems to me that money has a value and you have to pay that for it.

I would particularly like to thank Mr. Irvine for a very good paper. I am only sorry that more questions have not been asked relating to the details of the paper, because perhaps those very details would be of interest to members here today. I was interested, for instance, in some of the statements he made in connection with wood poles and I was wondering why those wood poles are not used after they have been treated in accordance with the Code of Practice as laid down by the SABS; whether that is considered worth-

Mr. H. R. Martin (Salisbury) expressed thanks for the complimentary remarks concerning his paper. He said that at that stage Salisbury had only succeeded in financing approximately 50% of their capital programme through capital development funds and that the first local authority to operate a consolidated loans fund in Southern Africa was Salisbury, in 1940.

Responding to discussion on his paper, Mr. D. R. Irvine (Salisbury) said that on the question of amalgamation, he felt that in Rhodesia discussion on this matter appeared to have engendered less emotion than in the Republic of South Africa. Referring to the African township outside Umtali, he said that there was a total of 303 houses; they were all wired and a cut-out was taken out or put in every week, according to the weekly payments. He said that, in principle, the Commission did not believe in one tariff classification subsidising those in another and they would definitely try not to subsidise the electrification of African housing directly by charging other people more than their type of load warranted. He agreed with Mr. Dunstan that care should be taken in giving facts and half-truths to laymen.

Mr. Irvine referred to the fact that the Electricity Supply Commission in Rhodesia was completely autonomous in relation to salaries which it could offer. In reply to Mr. de Villiers he said:

On VHF we are allocated five frequencies — each set has two, of which one is common throughout the country, and the others are distributed over the country with the idea of minimizing interference between the various frequency channels.

In respect of demand tariffs he felt that our tariff implied a double penalty. Perhaps it does but it also gives a double incentive. Frankly I do not think you can have the one without the other. We pay Central African Power Corporation for all the electricity over

while or too expensive or what, because perhaps that would be an economic way of getting better usage out of them.

One of the interesting things there, of course, is that the financial situation, Mr. President is changing all the time and whereas there were very great economies in wood poles a few years ago, that still applies today to the lower voltages, but for voltages of the order of 66 and 132 and definitely above, the picture is changing at the present time because the wood poles are just becoming gradually more expensive in the Republic of South Africa. I wonder whether that is something which also applies in Rhodesia.

Mr. H. R. Martin (Salisbury) spreek sy dank uit vir die gunstige opmerkings wat in verband met sy referaat gemaak is. Hy sê dat Salisbury in hierdie stadium in staat is om slegs sowat 50% van sy kapitale program uit kapitale ontwikkelingsfondse te finansier en dat Salisbury die eerste plaaslike bestuur in Suidelike Afrika was wat 'n gekonsolideerde leningsfonds in die lewe geroep het, en wel in 1940.

In antwoord op die bespreking van sy referaat, sê Mnr. D. R. Irvine (Salisbury) dat, met betrekking tot die kwessie van amalgamasie, hy van mening is dat die bespreking van hierdie onderwerp in Rhodesië nie die gevoelens so hoog laat loop het soos wat die geval in die Republiek van S.A. was nie. In verband met die Bantoeoord buite Umtali sê hy dat daar altesaam 303 huise is; hulle is ainal bedraad en 'n uitskakelaar word elke week ingesit of uitgehaal, al na gelang van die weeklikse betalings. Hy sê dat die Kommissie in beginsel nie daaraan glo dat mense in die een tarief-groep diegene in 'n ander tariefgroep moet subsidieer nie en dat hulle beslis sal probeer om nie die elektrifisering van Bantoehuise direk te subsidieer deur ander mense meer te laat betaal as wat hulle besondere tipe vraag regverdig nie. Hy stem saam met Mnr. Dunstan versigtigheid aan die dag gelê moet word sover dit die verskaffing van feite en halwe waarhede aan leke betref.

Mr. Irvine verwys na die feit dat die Elektrisiteitsvoorsieningskommissie in Rhodesië heeltemaal outonoom is in soverre dit die salarisse wat aangebied word, betref. In antwoord op Mnr. de Villiers se vraag, sê hy:

and above that which we consumed when Kariba was first brought into operation, at the rate of £8 9s. a kilowatt a year and the unit rate is 0.02 pence per kilowatt-hour. It hardly seems worth their while working out the unit charge at that rate. We have obviously got to give every incentive we can for people to keep their kVA demand down.

Kilowatt hours per employee: the figures did include all Commission personnel in power stations. It, of course, excluded the personnel running the Kariba

Power Station. On the basis that the Commission takes approximately a quarter of the output of the

Kariba, one could add a quarter of the Power Corporation's staff, but the effect would be very small indeed.

Continuing, Mr. Irvine said:

Voortgaande sê Mnr. Irvine:

I return now to that small section of the paper which seemed to interest most people. The main criticisms seemed to be concerned with democracy in the industry. Mr. President, I cannot believe that anyone really believes that democracy ends with local government. The Commission is answerable to Parliament and that surely is at least as democratically elected as are the town and city councils.

Now we get on to this query of Mr. Lynch's: why no representative of the Salisbury Municipality on the Commission in the event of amalgamation? Mr. President, I do not think that any body like the Commission could ever guarantee representation of one individual consumer body on the Board: it just isn't practicable. You cannot have Boards that are as large as the Privy Council because you do not get anywhere . . . (there are political repercussions in that, we won't go into it!).

Regarding the Electricity Council which today has also been called "a toothless watchdog", I am sorry I cannot agree with that. It is the consumers' watchdog and Mr. Hooley adequately dealt with this, I feel; but as a person who has had to go to meetings of the Electricity Council in connection with the license, they are certainly not toothless. They didn't bite me, but they have the teeth if they have to!

I would, however, ask Mr. Lynch whether he has perhaps forgotten that when we were discussing this business of amalgamation, the Commission's General Manager offered a consumers' consultative committee composed of representatives of both the City Council and the Town Councils around, who presently constitute the Salisbury Municipal Electricity Undertaking. That is something which no other body has at all.

Answering Mr. Robson, he said:

In antwoord op Mnr. Robson sê hy:

"I don't think cheap power is responsible for load growth. Load grows exponentially for one reason and that is that the population grows exponentially: it doesn't grow at the same rate as load growth because man is inherently shy of physical work, and if he can possibly get something to do his work for him he will use his brains to do that; and that is why the load is growing all the time. In Mr. van Wyk's paper yesterday there was talk of getting down to 30 hour weeks later on, and that's the sort of thing that man's brain is actively engaged upon all the time.

Mr. President, our tariffs in the ESC have been unchanged since 1960. I don't know how many municipal electricity undertakings are in that same happy position. Not only have they been unchanged since then but we're now looking into **reducing** them!

On security of supply and load shedding: a very difficult one in a country like this. Could I just say that we do what we possibly can, but if we are going to keep our tariffs within a reasonable limit, there isn't really much more that we can do. Incidentally, on tariffs: just one bit of trumpet blowing which I somehow omitted from my paper and I cannot get away with it — Mr. Dunstan talked about yardsticks of the cost:

I think we've got our wires crossed on the subject of staff attraction to a larger organisation. The point I was trying to make was that we in Rhodesia are very very conscious of our brain-drain: we send a lot of students down to universities and, at the moment, about 10% of them are coming back. This is rather a tragic position to be in and I quite honestly and sincerely feel that if we have a large organisation with a wonderful job — you know the £ sign (or rands or dollars, as we shall have later on) and lots and lots of noughts at the back of it — you will get the truly ambitious lad thinking twice before he automatically leaves his country of birth. We will definitely be able to keep more people, especially young engineers, in this country.

In reply to Mr. Lombard, Mr. Irvine said:

In antwoord op Mnr. Lombard sê Mnr. Irvine:

Auto-disconnects with load brake heads; the replacement of them: I don't think we've ever had to replace one of them actually. We've got two types — one has a sulphurhexafluoride head in it and that of

course, has to be re-charged; the others (there are some in operation just down at the power station here) I don't quite honestly think have ever operated under load, under fault, and so far we haven't had to get involved with the problem.

The following written contribution to the discussion on Mr. Martin's paper was received from Mr. W. H. Milton (Hon Member):

Die volgende geskrewe bydrae tot die bespreking van Mnr. Martin se referaat is van Mnr. W. H. Milton (Erelid) ontvang:

Mr. President, ladies and gentlemen, I have read the paper presented by Mr. Martin with appreciation. May I congratulate him on his very clear exposition of his case. This subject was dealt with at a previous convention, but only lightly touched upon. At that time I supported the proposal, but indicated some of the difficulties to be cleared away if it was to be adopted with little or no sound objection. In the first place it seems to me to be desirable that a definite proportion of expected future capital investment in plant should be the aim of contributions to the Capital Development Fund. For example, the Fund may be considered necessary to meet the cost of replacement of obsolescent plant and, in addition, to meet a selected proportion of the cost of additional plant required from time to time to cater for an expanding system.

In order to give effect to such a basis, it is obviously essential to decide the probable replacement cost of the historical assets involved. When doing so some effort must be made to provide for the reducing value of money expected during the active life of the assets involved, but regard must also be had to the fact that smaller "historical" assets are likely to be replaced by larger and more efficient "future" assets. This latter aspect has the effect of reducing the possible incidence of the reducing value of money, if not going beyond that point.

When I expressed my views on the previous occasion, I said that one aspect of the proposal always seemed to be avoided when this subject was discussed. This was the origin of the capital required to finance capital works. When one considers borrowing capital from an outside source, little thought is given to the origin of the capital in that source. Put very briefly, that source is the "pool" established from profits accumulated by the owners of the "source". If one continues on this line of thought, (and let us restrict our consideration to Electricity Authorities), a part of that "pool" has been established by the users of electricity, both directly and indirectly. An example of the indirect contributor is the domestic consumer, who has a balance left over after paying his electricity account, which enables him to contribute through others to-

wards their profits. If this argument is at all reasonable, it follows that there can be no real objection to the Electricity Authority deciding to accumulate its own "pool", provided of course the "pool" so established is used for its own capital needs and the use is treated in the same way as the borrowing from an outside "pool". This means that the internal "pool" must receive interest and the money advanced from the "pool" must be repaid. This is also stressed by the author.

May I also support the author in his view that the cost of electricity is not a very important item in the establishment and development of an industry, as is so often claimed, except in some electro-chemical industries. If such an industry requires to be fostered, or any other industry for that matter, surely it is better to be open and above-board about it and quote a special tariff for the purpose, if necessary with the positive statement that revenue from this source is not contributing to the Capital Development Fund, or that it is actually being subsidised at the expense of other users to obtain indirect financial benefits. In my own experience I know of decisions that have been taken to locate where there is an abundant supply available sooner than run the risk that sufficient power may not be available when the time is opportune for further development.

Although tempted to contribute on the subject of "relief of rates", my views have so often been expressed at these conventions that it may suffice to say that some contribution may well be justified when the services rendered by other departments is paid for at reasonable prices, the maximum so payable towards relief of rates is very small. I am always reminded of the half truth so often uttered, viz., that tenants do not pay rates! If the landlord does not provide for recovery of the rates he pays, as well as his other expenses arising from ownership of the property when fixing the rental, I do not think he knows his business.

I congratulate the author on a most instructive and timely paper, and express the hope that his is not a "crusade" but a realistic introduction of an essential process.

3rd Day, AFTERNOON SITTING

In the unavoidable absence of Mr. R. L. Richards, Mr. D. J. Pibbrough (Standards Association of Central Africa, Salisbury) presented the paperette "Electrical Standards in Central Africa" produced by Mr. Richards, the Association's Director. This paperette was published in Volume (1) of the A.M.E.U.'s 1969 Proceedings.

Mr. A. A. Middlecote (S.A.B.S., Pretoria), in expressing appreciation for the paperette, said:

3de Dag, NAMIDDAGSITTING

In die onvermydelike afwesigheid van Mnr. R. L. Richards, lewer Mnr. D. J. Pibbrough (Standaardvereniging van Sentraal-Afrika, Salisbury) die referaatjie „Elektriese Standaard in Sentraal-Afrika“, wat deur Mnr. Richards, die Vereniging se Direkteur, voorberei is. Hierdie referaatjie is in Volume (1) van die V.M.E.O. se Verrigtinge vir 1969 gepubliseer.

Toe Mnr. A. A. Middlecote (S.A.B.S., Pretoria) sy waardering vir die referaatjie uitspreek, sê hy:

International Standards are important and they are produced by negotiation between different countries in the world. This is done mainly to a large degree by power blocks, of which the most powerful is the European block. Another one becoming increasingly so now because she's becoming more concerned with International Standards, is the North American block; and there is also a growing Asiatic block where they tend to get common area standards. That leaves us in the Southern Hemisphere (who have a very common, shall we say, climatic condition and also a very similar labour condition; i.e., Australia, perhaps South America and Southern Africa) to either tack our allegiance onto one of the others, which is not a very satisfactory sort of affair; or this means that really we need to get together down South here and work together as Standards Organisations, not to close the market for anyone else but just to ensure that when the International Standards are produced, we have a voice as a group of people who want standards of a certain quality to suit our local conditions best. Then we can negotiate and come to some compromise which then results in what we call International Standards.

The approach to the Wiring Regulations in the Central African Standards Organisation is very good; the approach to promulgation is much better than ours and does allow for easy and quick amendment to suit the changes in technology which occur so rapidly these days. I think you will all have heard that the decision has more or less been made to hand over the responsibility for the Wiring Regulations from the Institute of Electrical Engineers to the Bureau of Standards. It may well happen (we don't know for sure) that perhaps there may be a new approach to the method of promulgation—maybe the Wiring Regulations will turn into a Code of Practice rather—and perhaps (this is just one of the suggestions) they might be used by reference in, shall we say, the Wiremen and Contractors Act, to allow them to be applied and yet leave the freedom of amendment, so that one is not tied to legal changes as time goes on.

The remarks concerning socket outlets are also interesting and very logical in Rhodesia's case. We studiously resisted efforts to go haywire over the 13 amp plug for the very good reason that we did have more or less a reasonable standard; so we have tried to stick to the old 15 amp plug. This doesn't mean to say that we think it's a wonderful plug, but it was a standard plug and it could stop chaos developing when you had a multiplicity of plugs, which was the case in England and led to the establishment of the 13 amp plug. We do feel that there may well in the near future, be an amendment to the plug, but this will be dictated by several important factors: the first is the fact that we will have to change to a degree to satisfy metrication; then there is a desire to go over to the method of moulding in your flexes in the plug;

and thirdly, there is the preference to have a light, unbreakable plug—we all know what our local domestics do with the normal 15 amp. Then there is further the desire to agree a little more, if we can, with International Standards; and the final one is a possible change back to perhaps a two wire unearthed system in the wiring of buildings.

This last point is of particular interest, as also the statement made in the paper (I think it refers to a statement made by Mr. Hooley some years ago) that he saw no reason for having earth connections in earth-free situations. There is no doubt that the modern building does tend to have such a condition but do not let us go haywire on this, because if one examines the domestic accidents of Germany, America and Britain, one will find that Britain's record is consistently better than the other two; as a matter of fact, the fatalities per million population are about half. This may well be due to a difference in usage; I know statistics are very very dangerous things, but I don't somehow think that the difference of usage would have made a great difference between those of Germany and Britain.

I have thought about this a lot and I think the significant factor is that Britain has consistently insisted on good earthing; she has done that and she can do it, since earthing conditions are not as difficult there as they are in many areas of South Africa. This same philosophy of difficult earthing obviously led the Americans to allow non-earthing in what they called areas where earthing of the electrodes would be difficult and in Germany they allowed an alternate earthing, or certain areas which had to be picked by the contractor when he did the building, could be declared earth free and then there was no earthing. I think it is because of this alternative that confusion has arisen, and I know the Germans are, in fact, considering rather going in for earthing to a larger extent than before. This rather destroys a lot of the case for going back to a two wire system. However, let us look at the possible good in this country.

I think in South Africa we have had bad earth conditions and there is therefore a strong case for preferring an unearthed system here, for the following reasons; the earth leakage relay is fast becoming a reliable watchdog for those cases where an earth occurs in what is accepted statistically as an earth-free situation; most modern appliances are of the double-insulated type and several other classifications of extra insulation for those you can't double-insulate (I refer particularly to thermal type of appliances); most buildings in the Republic are earth-free, at least the modern ones; earthing is difficult in the Republic, especially on the Highveld; there is a considerable saving in installation costs and we have got to consider this point; and if you had a two wire system, that part of the installation which has to be done during the hurly-burly of the actual building, where you have people rushing

all over the place, becomes a much more simple and straightforward operation, and therefore I feel there is less likelihood of something going wrong there.

Those are some of the advantages; there may be many factors against this, but looking into the future, it may well be the wiring system of the future. I feel, though, that we have got to do this fairly soon because we have to change a lot of things owing to metrication changes anyway; and for us to make a double change would be rather uneconomic and also rather a strain on our local industry, who would have to tool up twice in the period of a few years.

These considerations to me all emphasise that safety is a **whole** question; in considering it one must survey **all** the parts that make up its whole. Four of the most important are:

- (a) the actual system of wires;
- (b) the type of appliance used;
- (c) the system of protection;
- (d) the quality of labour.

These should all preferably be handled by a single organisation for reasons of obvious co-ordination. This is apparently done in Rhodesia and let us hope that this will be the case, as I've mentioned, in the Republic, in view of the SAIEE possibly handing over the responsibility to the SABS.

This is also particularly desirable in view of the fact that the SABS will have full-time staff to back up the magnificent work done in the past by overworked officials of local government in their spare time. This has been a terrific drain on the people who have courageously really done a magnificent bit of work; and there's no suggestion of any, shall we say, shortcoming there, except time — they cannot give us any more time than they've squeezed out in the past.

The International World has already also become aware of this need for a "whole approach" and it's quite interesting to know that the **urgent** work in the International Electro-technical Commission at the moment is the Committee 64 which deals with the installation of buildings (electrical): Part One of this recommendation (Britain holds the Secretariat) is devoted to fundamental principles in the following sections:

- (i) definitions — to make sure we all know what we are talking about;
- (ii) the principles of safety, i.e., the principles

Mr. J. L. Hooley (Salisbury) seconded the vote of thanks.

Referring to the memorandum on the suggested ground and air temperatures to be used for reference purposes in the Republic, Mr. Middlecote asked whether the A.M.E.U. felt it was in a position to make a recommendation supporting or querying these recommendations. At the conclusion of discussion on

they consider are going to underlie everything they do later in their recommendations;

- (iii) the design principles;
- (iv) the principles for the selection of equipment;
- (v) the principles for the erection and testing of electrical installations.

I feel that quite good guidance will come out of these deliberations and will help considerably in the future, seeing that these will be, shall we say, a World Forum of opinion.

This is a hope for all of us who have to deal with standardisation. Our fundamental desire is to bring order from chaos, and it is so effected through patchwork on a well-worn, faithful, but nevertheless out-of-date quilt. Patchwork can only extend so far, and a new quilt has to be made sometime. This requires some moral courage in view of understandable conservatism on the part of those who take the responsibility for safety; economic factors as far as manufacturers are concerned, and difficulty with legislation. However, at the right time the change **must** come, particularly if one remembers that every ten years of delay makes the problem twice as hard.

Nevertheless, I feel confident that with the help of the AMEU, the best solution to this problem will result in the near future, and I hope that the authorities in Rhodesia, and particularly the Standards Association of Central Africa, will also co-operate with us in this regard.

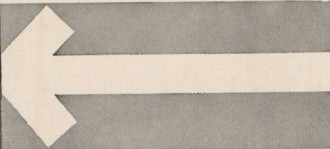
I would like to endorse the work the Standards Association of Central Africa is doing with regard to the mark scheme: I always think the greatest value of the mark scheme is that you train your industries in quality control and you also help people draw up more effective specifications. When you do a specification for the first time you can easily describe something that is satisfactory, but the greater difficulty is to describe some requirements which will give enduring compliance, and not only this but consistent manufacturing line compliance: in other words, you can have something that complies on the prototype but the incidence of going out of control is too high. Those things must be taken into consideration in specifications or else they are simply ineffective; and here I will admit that we have many ineffective specifications; sometimes I blush, but we do hope to get them all into a very effective form".

Mnr. J. L. Hooley (Salisbury) sekondeer die mosie van dank.

Met verwysing na die memorandum in verband met die voorgestelde grond- en lug-temperatuur wat in die Republiek vir verwysingsdoeleindes gebruik moet word, vra Mnr. Middlecote of die V.M.E.O. van mening is dat hy in 'n posisie verkeer om 'n aanbeveling te maak waarin hierdie aanbevelings gesteun of teengestaan word.

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the paper, the President referred to the S.A.B.S. report made the previous day and to the discussion on the milliamp leakage large enough to cause loss of human life—50 milliamps as against 80 milliamps had been mentioned—and asked Mr. Middlecote to give his views.

Mr. Middlecote said:

This is actually the basis of the whole principle of earth leakage relays—statistical probability. I assume that I have to try and answer these various questions on the, shall we say, lethal level of current with reference to earth leakage relays. Here it must be remembered that engineering is an art, not a science. I think it was Sir Alfred Hinton who stressed this very point in a speech he made at the British Power Conference one year. Science knows only **one** answer to a problem—it has only one answer; but most engineering problems have several answers and it is the **art** of engineering to select the best answer to the particular problem.

Bearing this in mind, one can better approach such a thing as electrical accidents. Now this is a statistical occurrence and the only way to resolve it is to come to a debate and present all the evidence, however distasteful and however shattering to one's own personal convictions: this is the only way of finding out the best answer.

When you come to accidents you deal in statistical occurrences; this has been explained many times before and I won't repeat the basis for this here, but I would like to give a simple answer—we all know that many more people get killed falling down stairs than they do getting electrocuted. We do not stop making stairways, we make better stairways, but even that leaves a **slight** statistical probability, in that if somebody had a fainting fit on an economically well designed stairway, he might still fall down and kill himself.

So we always have to accept a statistical value. If, however, one deals with the cost of making something safe (it's like quality) you get a curve on a graph that saturates near the top. In other words, the rate of increase in cost for a given increase in safety is very high; whereas the increase in safety for a high expenditure does not go up in the same proportion. It's rather like using capacitors on a system—you do not correct to zero; you correct to something below that, because it's economic.

In tackling a statistical problem you get the best compromise when viewing this whole problem of safety. Sometimes you do not have all the answers and you have to have a temporary compromise. So that in connection with the dangerous currents, all that I can say at the moment (and I am talking as Chairman of a couple of Committees, and not merely as Pat Middlecote) is that the present available information

Na afhandeling van die bespreking van die referaatjie, verwys die President na die S.A.B.S.-verslag van die vorige dag en na die bespreking van die milliampere-lekkasies wat genoeg is om die verlies van 'n mens se lewe te veroorsaak—50 milli-ampere teenoor 80 milli-ampere is genoem—en vra Mnr. Middlecote om sy menings oor die saak to gee. Mnr. Middlecote sê:

seems to indicate that 30-50 milliamps is **reasonable** protection, provided the time of tripping is controlled and not allowed to persist for too long a period. Information is available to establish that time/value relationship.

My own personal opinion was expressed some 12 years ago when I stated that earth leakage settings of 50/60 milliamps were realistic, particularly since, statistically speaking, in a genuine accident (I'm not talking here about deliberate interference) there will be an earth resistance in parallel with the body of the person touching a live part, and this will usually be far lower than the average resistance of a human body. In fact, I would venture to say, conservatively speaking, in most cases even with 50 amps through the earth leakage relay you would probably have 15-20 amps actually going through the body of the individual concerned.

However, I was prepared as an individual, to accept a committee decision to allow a lower threshold of operation current some years ago. Now we all know the result of this—much tripping of relays and a lot of mistrust in the use of this very valuable watchdog, the earth leakage relay.

At the same time I think this was a good thing, because lowering the threshold current and inviting all these troubles, did show us that there are a lot of other things we must put right if we can. The two most important things needing attention are better wiring control and better specifications for appliances. Here I refer particularly to the stove, and we are going to have a vast improvement in the new specifications to reduce the probability of spurious tripping from these. Attention to these latter may well result in a reversion ultimately to earth leakage sensitivities of 10 mA or so.

Meanwhile the limits of 30-50 appear to be reasonable in the light of present information. Remember, though, we are dealing with a very dynamic age and opinions are fast changing. Twelve years ago, playing round with figures that were then available, it appeared that 10 mA was not such a pleasant current to experience and should not be really allowed. They also muttered then that you could get 2000 ohms resistance in a body, and, of course, that showed that 20V was dangerous! Well, we all know that is ridiculous, but it does show what absurd situations can crop up when dabbling with figures unnecessarily.

However, since those days very much more work

has been done, not only in America, but by several people on the continent: it has been debated in the World Labour Organisation; and, generally speaking, the figures that we have suggested appear to be a reasonable compromise, which should give us the protection we require. But, please remember, it is statistical — you will never eliminate a failure or an ultimate electrocution on a very low statistical basis.

From my own point of view engineers of undertakings who consider making the installation of earth leakage relays compulsory, could help considerably by ensuring a system whereby all mal-operations are reported to them, so that genuine statistics as regards reliability of the sensitivity concerned could be made available.

We simply cannot get figures; we have tried hard. One or two municipalities have managed to give some form of figure but most of them simply say they never hear of it and that it is simply dealt with by the con-

Mr. R. B. Anderson (C.S.I.R., Pretoria) expressed appreciation for the high standard of the paper and for the progress made by the Standards Association.

Referring to Mr. Middlecote's contribution and his subsequently expressed views on earth leakage settings, Mr. Hooley said:

The relationship between the undertaking and the consumer is primarily a simple contractual one, where one party sells electricity and the other buys it. In Rhodesia we have moved away from the paternal attitude earlier adopted by Supply Authorities whereby the consumer had to be molly-coddled, but, in return, we have had to accept obligations not merely confined to the safety of his wiring installation but including irksome and restrictive requirements of local regulations and by-laws.

I think we have succeeded in this in publishing Electricity Supply and Wiring Regulations and Wiring Rules which provide that the consumer can serve a statutory notice on the Supply Authority in terms of a certified statement by the electrical contractor that the latter has inspected and tested the installation in accordance with the Wiring Rules and that it complies with the Wiring Regulations. There is nothing to inhibit the consumer from doing what he wants to do, provided he does it safely. If, in fact (and I have been told on previous occasions that this is merely stating the obvious) the installation is carried out in accordance with the Standards' Association Wiring Rules, then it is safe.

Electrical accidents can broadly be divided into two categories—those associated with uninsulated outdoor power lines and those related to indoor installations and appliances. Overhead power lines installed

tractor in a very questionable manner.

Also, it would be appreciated if members of the AMEU could draw up a directive as to how they could best handle the situation where irate customers are without supply due to spurious tripping, and where there is used, in the spirit of the recommendation of the Advisory Committee, tamper-proof earth leakage relays. I would appeal that they try and get these figures, because we will need them in the future and the undertakings are the only people who can say that, on so many earth leakage relays fitted, there were so many occasions where spurious tripping was reported.

I don't know if that was the real answer required: all I can say is that we feel that from a committee point of view, 30-50mA appears reasonable in the light of present conditions of wiring installations, appliances provided and the method we have of making it compulsory, which is only by the authority concerned himself.

Mnr. R. B. Anderson (W.N.N.R., Pretoria) spreek sy waardering uit vir die hoë standaard van die referaat en vir die vordering wat deur die Standaardvereniging gemaak is.

Met verwysing na Mnr. Middlecote se bydrae en sy latere opmerkings oor die instelling van aardlek-kasies, sê Mnr. Hooley:

in accordance with the Regulations and at the prescribed heights, do fall down on occasions, particularly due to lightning strikes on wood poles and from cross-arms breaking; or lines may be touched from ground level by farm workers handling long sections of metal pipes for irrigation purposes.

In Rhodesia an 11,000V conductor can lie on the ground in our dry winter season and remain undetected if there is no interruption of supply and thus no consumer to report that he has no power. A power line can lie there long enough to discharge into the ground and vitrify it while still remaining alive. In that condition some person or animal invariably touches it. About half the electrical accidents in Rhodesia occur on outdoor power lines, and often a person comes into contact with a live line where the line protection operates too slowly or not at all, or is nullified by automatic reclosing. The Rhodesian Electricity Supply Commission's paper refers to protection but I did not hear the details of the provisional arrangements for meeting this condition, although it is one that has to be dealt with. When we come to talk about sensitive earth-leakage circuit-breakers for indoor installations, I think this Convention should also give some thought to similar personal protection in relation to outdoor power lines.

With regard to indoor installations and the sensitive earth-leakage circuitbreaker, the correct value of

its operational current has to be provisional at this point of time. In many fatalities a person comes into contact with a live conductor and the earth simultaneously, thus providing an earth-path through the body to earth, but usually without any parallel earth-path. In many cases the victim is holding a live conductor whilst standing on the ground, or he comes into contact with an effective earth conductor that has itself become alive. I have known such cases where the victim's body has remained in circuit with a fuse as low as 5 amperes, which has not even blown at the end of a lengthy period of time.

If we are to make empirical rules for determining lethal current levels, I think we must start by accepting even 1 ampere as a killing current, so that any ordinary circuit-breaker or fuse which necessarily has to carry the normal current in the circuit may provide no personal protection whatever. It is a pious hope to expect that every electrical fault will somehow find an instantaneous and effective low impedance path to earth to discharge the several amperes necessary to ensure immediate operation of a protective fuse or ordinary circuit-breaker. If, as is so often the case, the only path to earth is through the victim's body, then death is virtually inevitable, unless the supply can be rapidly disconnected by, say, prompt action on the part of another person or, more reliably, by the operation of a sensitive earth-leakage circuit-breaker.

It has been assumed that 20mA is a reasonable operating current level for such a circuit-breaker, although American research indicated that even 20mA may be fatal in some situations. Unlike the proving of other electrical theories where, for instance, switch-gear can be tested to destruction, this is obviously impossible in the case of the human body to determine the lethal current level, since this varies widely between one person and another and is influenced by many factors such as skin condition and resistance, bodily fitness, type of footwear (if any), local conditions, etc. The ideal operating current level would be very slightly above zero, but this would increase the incidence of nuisance tripping.

I have used two sensitive earth-leakage circuit-breakers set at 20mA in my own installation. I do have nuisance tripping occasionally, which involves restarting several electric clocks, but, as far as I am concerned, this is the only nuisance factor. On the other hand, during several thunderstorms, when I was previously concerned that I was about to lose my refrigerator or some other appliance with a micro-gap switch vulnerable to lightning, I have found that, in addition to personal safety, safety to property is enhanced by the sensitive earth-leakage circuit-breaker, which readily trips when lightning strikes in the vicinity.

I am prepared to tolerate nuisance tripping but with regard to the ordinary consumer, where he has to be sold the idea as well as the circuit-breaker (except in the case of a new installation where it may be

installed in advance as part of the wiring), it is an expense and he has to be convinced that it is going to be worth it. Whether it would be reasonable to assess the degree of nuisance tripping by taking a kind of Gallup poll amongst about 100 users, I do not know. This might be possible but it could be misleading and result in the supply authority's becoming responsible for every tripping incident at any time of the day or night, and the incidence of call-outs could rise considerably. The consumer, lacking technical knowledge and being the subject of the special investigation, would think it his duty to call the faults man every time his circuit-breaker tripped. This would present a problem and could draw undue publicity and prominence to nuisance tripping.

Like Mr. Middlecote I was "tripped" myself by this question from the Chair! Had I but known, I would have come prepared with greater details and notes. If the Association intends to examine the subject further, I would be very pleased to assist in any way I can from Rhodesia. At this stage, I recommend the use of sensitive earth-leakage circuit-breakers.

I also recommend, in spite of trends to the contrary, the elimination of earthing where it is unnecessary. This morning mention was made of earthing corrugated iron roofs. I have dealt with about six fatalities which have occurred on metal roofs, and in every case it was because the roof was earthed when it might not have been. I am aware that people, especially children, climb roofs, but an unearthed roof can be far less dangerous than an earthed roof where there is risk of coming into contact with overhead service mains. The modern practice is to install underground service mains into premises, but when this is not possible and mains have to be attached to metal roofs, they should be doubly insulated and made fully weatherproof; thus eliminating any risk of the roof becoming alive by contact therewith.

If earthing is still insisted upon in such circumstances, it can only be done safely if every sheet of the roof, gutter-section and down-pipe is properly bonded to its neighbour to ensure an immediate and effective electrical discharge to earth such as will operate the comparatively high-graded fault protection on the local distribution system. It must be understood that local protection against electrical faults or means of disconnection cannot ordinarily be provided at the consumer's local distribution board where incoming mains are involved. It is necessary to take cognizance of these facts before installing mains on a roof, or before introducing a mass of earthed metal at roof level where earthing could be dangerous as well as unnecessary, except perhaps as a doubtful lightning arrester, which is just as likely to attract strikes as to dissipate them.

In indoor situations, there are many rooms with non-conductive floors where the only connection with earth is through the earth conductor of an appliance.

If every appliance was earthed efficiently and properly, and could be relied upon to conduct sufficient fault current to earth so as to operate the protective fuse or ordinary circuit-breaker, there would be some degree of safety in it. We know, however, that this is not always the case and that an inefficient earth conductor, whilst restricting the fault current below the required operating level, may pass the comparatively few milliamps sufficient to cause electrocution.

In the average case, death from an electrical appliance is due either to a person touching a live conductor whilst in contact with the mass earthing on the appliance, or he is holding an ineffectually earthed appliance which has become alive. In many situations, if the appliance had not been earthed, or alternatively, had been properly earthed (which is difficult to ensure) the electrocution may not have occurred. I do point out though (and I am ready to argue this issue) that introducing earthing unnecessarily into an otherwise earth-free situation can be a bad thing.

The Convention proceeded to consider reports, all of which were published in Volume (1) of the 1969 Proceedings:

"Annual Report of the Recommendations Committee for New Electrical Commodities":

In response to a request from Mr. C. Lombard (Germiston), Mr. A. A. Middlecote said that he was not prepared at that stage to commit himself on the implications of the definition of "specification" in the Standard Wiring Regulations.

"Annual Report of the Electrical Wiremen's Registration Board":

No comment.

"Report of the Rights of Supply and Generation Subcommittee":

Mr. E. de C. Pretorius (Potchefstroom) supported Mr. P. J. Botes (Roodepoort) in referring to the predominantly good relations which existed between supply authorities and ESCOM.

"World Power Conference Report":

Mr. R. W. Barton (Welkom) referred to the fact that the 250 papers presented at the Moscow Conference last year were available to A.M.E.U. members, should they wish to see them or to take copies, at ESCOM House, Johannesburg. He also advised that the body was now termed "World Energy Conference".

"Report on S.A.N.C.I. Congress, 1968":

No comment.

"Report on Training of Engineers and Technicians":

No comment.

"Report on the Standard Wiring Regulations":

Certainly these days one can get double-insulated or all-insulated appliances in which there is readily touchable metal that can possibly become alive, so that the earthing is not only unnecessary but impossible; making the provision of an earth-conductor to such an appliance redundant. In the past electric drills, for instance, have been a common cause of death because they have to be held firmly in the hands when in use, and in such circumstances if the ordinary metal-enclosed drill becomes alive and remains alive due to ineffectual earthing, the victim is usually unable to release his grasp.

I believe that the earthing problem demands a closer study of the protective multiple earthing system which is covered in the Rhodesian Electricity Supply and Wiring Regulations. It is also necessary to consider greater use of sensitive earth-leakage circuit-breakers, extra low-voltage appliances and double-insulated or all-insulated appliances.

Die Konvensie oorweg hierna die volgende verslae, wat almal in Volume (1) van die Verrigtinge vir 1969 gepuliseer is:

"Jaarverslag van die Komitee vir Aanbevelings insake Nuwe Elektriese Ware"

In antwoord op 'n versoek van Mnr. C. Lombard (Germiston) sê Mnr. A. A. Middleton dat hy in hierdie stadium nie bereid is om 'n mening uit te spreek oor die implikasies van die woordomskywing van „spesifikasie" in die Standaard-bedragsregulasies nie.

"Jaarverslag van die Registrasieraad vir Elektrotegniese Draadwerkers":

Geen kommentaar.

"Verslag van die Subkomitee insake Voorsieningsregte en Opwekking":

Mnr. E. de C. Pretorius (Potchefstroom) ondersteun Mnr. P. J. Botes (Roodepoort) in verband met die oorwegend goeie verhouding wat daar tussen voorsieningsowerhede en EVKOM bestaan.

"Verslag insake die Wêreld-kragkonferensie"

Mnr. R. W. Barton (Welkom) verwys na die feit dat die 250 referate wat die vorige jaar by die Konferensie in Moskou gelewer is, by die EVKOM-gebou in Johannesburg vir lede van die V.M.E.O. beskikbaar gestel in indien hulle dit wil lees of afskrifte daarvan wil maak. Hy sê ook dat die organisasie nou as die „Wêreldkonferensie insake Energie" bekend staan.

"Verslag oor die 1968-kongres van die S.A.N.R.V.":

Geen kommentaar.

"Verslag insake die opleiding van Ingenieurs en Tegnisië":

Geen kommentaar.

"Verslag insake die Standaard-bedragsregulasies":

In amplification of his report, Mr. R. Leishman (Johannesburg) said:

First of all, the 1969 Amendments should be available within the next week or two—the final proofs have gone to the printers.

This will be the last amendment here and I was invited to the Council Meeting of the SAIEE on this subject and they asked me to convey to this Convention the thoughts that were in their minds about the handing over of these Regulations to the SABS.

I would like to give this Convention a background as to the motivation of this. This existing type is now finished; it has to be re-set and this is a very expensive operation and is bringing the cost of these proceedings to something around R1.50. Secondly, there is quite a lot of movement afoot to have a complete re-cast of the Standard Wiring Regulations—they are still

The President stated that this item would be discussed at the Executive Meeting at the conclusion of the Convention, but invited discussion by the Convention. Mr. A. A. Middlecote (SABS, Pretoria) said:

Should the AMEU feel that it is best left with the Bureau I'd like to point out that a directive from the Institute was that there would certainly be practically no change in the Committee itself. The work is that of technical secretary and as well as the normal secretarial services which is really being given.

We would also honour, for instance, the Regional Committees that functioned under the local branches of the Institute; we would retain that tendency to have an organised Regional Committee for discussion of matters.

I do think, though, that should this happen, we

“Co-ordinating Committee for High Voltage Research and Facilities”:

Mr. R. B. Anderson (CSIR, Pretoria) commented as follows:

First of all, you'll note that Professor G. R. Bozoli was down as the Co-ordinator in specialist field for insulation. In view of his duties at the University of the Witwatersrand he has been unable to continue with this and his place has been taken by Mr. R. A. Helliwell who is Senior Lecturer in Electrical Engineering at the University of Natal. These co-ordinators in specialist fields' main function really is to collect and collate information on research which is being carried out by various organisations—research organisations and others—and to present these research activities to the High Voltage Co-ordinating

Ter toelgting van sy verslag sê Mnr. R. Leishman (Johannesburg):

more or less in the form that they were in the 1940's and we need to update them. This sort of thing cannot be done by voluntary assistants; it needs full-time technical assistants. The Bureau of Standards has offered to find such full-time technical assistants to co-ordinate with the various undertakings. They are also prepared to help us with secretarial services; and there is another thing that is coming onto the scene now and that is the internationalisation of Standard Wiring Regulations through the CIE. I am requested by the Council of the Institute of Electrical Engineers to put it to the AMEU as to whether or not there are any people here who have any feelings as to why they should not hand over the Standard Wiring Regulations secretariat and drafting to the South African Bureau of Standards.

Die President sê dat hierdie saak na afloop van die Konvensie deur die Uitvoerende Raad oorweeg sal word, dog stel dit nogtans oop vir bespreking deur die Konvensie. Mnr. A. A. Middlecote (S.A.B.S., Pretoria) sê:

would certainly discuss this matter mainly with your organisation to make sure that we have a very very suitable Committee; because this is Committee work. We are just really going to provide a man who can specialise in getting information for the Committee to consider.

I would like to pay a personal tribute to Bob Leishman for all the work he has done in the Wiring Regulations; because, believe you me, those of us who have served on the Committee know that I think 95.8% or so of the work has been done by Bob Leishman himself. He has borne a terrific burden for the last few years.

Ko-ördinerende Komitee insake Hoogspanningsnavorsing en Geriewe:

Mnr. R. B. Anderson (W.N.N.R., Pretoria) lewer soos volg kommentaar:

Committee, with recommendations as to what they consider (or really what the people who have been interviewed consider) should be done in the way of further research.

The other point I would like to add to that is that is that in the field of insulating materials the CSIR was asked by the Advisory Committee on Electrical Engineering to start a section on insulation—a person who could look into the problems concerned with insulation, with specific reference to problems in the South African context, and we are pleased to be able to say that although we have not been able to

get a senior man, we have been able to get an M.Sc. student to take on this and he is showing great interest in this field. Some of you here may have been approached by him to find out all about it in the South African context; and he will be sent overseas for further training and will come back to do our part in this field. I think you will all agree that it is a very important field and there are many problems, particularly in the manufacturing field of insulation, which still require further work.

Another point: Mr. Leishman mentioned the mobile recording equipment which the CSIR has and this is rather pertinent. This mobile laboratory is now under way and its purpose is to record voltages on low voltage lines (and not 400kV as mentioned) 11kV in particular; and when Mr. Irvine gave his paper yesterday it reminded me of one thing — in do-

ing away with lightning arrestors at some sub-stations, for example, a problem does arise as to whether the wave form of surges could be dangerous to a transformer in the question of a time domain. We don't really know a great deal about the actual wave form of lightning on 11kV distribution.

Another aspect of this is the insulation levels which are needed for 11kV lines or unearthed or earthed construction and we hope to be able to collect the statistical information required. This I think you will agree will be very useful information, although it may take some time. Mr. Leishman's remarks were an appeal for the co-operation of this Association in this at the moment. We are in Pretoria and of course we are very thankful for help from the Pretoria Municipality, who, I am sure, will be able to place various types of 11kV construction at our disposal!

“S.A. Electronic Corrosion Main Committee”:

Mr. R. Leisman (Johannesburg) pointed out that he was the Association's representative to this committee and not the Chairman as printed in the report.

S.A. Hoofkomitee insake Elektrolitiese Korrosie:

Mnr. R. Leishman (Johannesburg) wys daarop dat hy die Vereniging se verteenwoordiger op hierdie komitee is en nie die Voorsitter, soos in die verslag aangegee, nie:

FOURTH DAY

MORNING SITTING

MEMBERS' FORUM

The President introduced Mr. A. F. W. H. Eggers (Department of Posts and Telegraphs, Pretoria) who addressed the Convention on the subject of “Co-ordination of Installation of Underground Plant in Municipal Areas”. Mr. Eggers referred to the desirability of investigating the possibility of co-ordination between the Post Office Engineering Branch and Municipal Electrical Undertakings in the provision of underground services. He also referred to the modern tendency for the provision of underground plant rather than overhead for aesthetic reasons, as well as from the point of view of improving the conditions of service, freedom of faults and reliability. He went on to say:

The recent Code of Practice of the Institute of Electrical Engineers which was issued towards the end of 1967 recommends that service feeds to premises should be placed underground as far as possible. This is a step in the direction which I think is going to be applied more and more in the future; and it's going to result in other plants still remaining overhead; stick-

VIERDE DAG

OGGENDSITTING

LEDE-FORUM

Die President stel Mnr. A. F. W. H. Eggers (Departement Pos- en Telegaafwese, Pretoria) aan die Konvensie voor. Mnr. Eggers spreek die aanwesiges toe oor die onderwerp „Die ko-ordinasie van die Installasie van Ondergrondse Dienste in Munisipale Gebiede”. Hy verwys na die wenslikheid daarvan dat ondersoek ingestel word na die moontlikheid van ko-ordinasie tussen die Ingenieursafdeling van die Poskantoor en Munisipale Elektriesiteitsonderneming wanneer ondergrondse dienste verskaf moet word. Voorts verwys hy na die moderne neiging om sulke dienste liever onder- as bognonds te installeer, nie alleen om estetiese redes nie, maar ook vanweë die voordele daaraan verbonde insoverre dit die verbetering van diensomstandighede, die uitkakeling van foute en groter betroubaarheid betref.

Voortgaande sê hy:

ing out like sore thumbs. It is also going to result in increased pressure on the Post Office to remove its overhead plant and to place it underground as well.

In considering this aspect from the point of view of the Post Office, there are two points that must be considered:

We are concerned with the provision of feeds in

streets between the exchange and subscribers' premises. This is a proliferation of wires — each subscriber requiring a pair of wires; and also with the provision of service on private property.

In both these cases we are involved with the provision of Post Office plant on property which does not belong to the Post Office — either it's under the control of the local authority or it's under the control of the property owner, a private person.

In the past the Post Office has traditionally provided feeds in private property on an overhead basis, mainly because of cost considerations and ease of distribution. I don't think it needs much explanation as to the methods which are being used presently, as they are all too evident — usually a block-feed from distribution points, an underground feed to a pole on the back line and overhead distribution along the back line from this point by means of what we refer to as "drop" wire (just an insulated pair of wires) or an aerial cable, which is a little more modern; then leading onto premises from poles along the back boundary line by means of drop wires.

The underground feed, as far as we are concerned, is attractive from the point of view of elimination of unsightly overhead feeds and, what we hope would be an improvement in the service to subscribers by a reduction in the fault liability. An underground feed or cable is less liable to faults than an overhead line. It is, however, tied up with the higher costs of installation which arise mainly because of the large amount of trenching which becomes necessary for the cable installation in streets and of each individual feed between the street and private premises. It is here where I think we should be able to do a lot of good by co-ordinating the provision of electrical services and the telephone service to premises.

We have, therefore, two cases that we have to consider: the one is the provision of cable and services on public property; and the second is the provision of cable and other services on private property.

As far as public property is concerned, taking this first, we have recently decided to install plastic-sheath, paper-insulated cables instead of the old standard of paper-insulated, lead-sheath cables: in some cases these being installed in pipes or ducts; in other cases armoured cables being buried, depending on the size of cable. We have found that the costs of the armoured cable tends to be relatively high; and when one considers the oft-arising case of cables, being too small, having to be replaced or increased, then it becomes attractive to avoid armoured cables and to prefer the use of these new cables in pipes or ducts.

To take this thought a little further, it seems practicable to install these pipes or ducts in streets somewhat in advance of the provision of underground cables. The question arises of the possibility of installing pipes or ducts at the same time as the power cable, water mains and so on, are installed. In fact, attempts

are being made overseas, notably in Britain at the moment, to evolve ways and means of providing combined trenches, which are perhaps dug in sections or alternatively in steps, providing the services which go at lower levels first, then filling in partially and following up with the other services on top. I'm not suggesting that this is the only way of doing it: it is not. There are other ways, the details of which I will not bore you with at the moment.

Obviously between telephone cables and power cables adequate separation has to be provided for reasons of avoidance of coupling or screening, and also to avoid the possibility of damaging other services in the course of maintenance on one service or in the course of making additions.

As far as private property is concerned, the telephone service is not necessarily a necessity for the owner of the property — not a necessity of life in the same way as power and water are. In fact, it very often happens that a person takes water and power supply, and a telephone is not required (assuming that one is available) for a number of years after the property has been occupied for the first time. In some cases properties are built for speculation purposes; in others, the initial owners do not apply for a telephone service, either because they cannot afford it or for various other reasons. Subsequently the properties change hands and the new owners or new occupants require telephone service and we find many cases where telephones have to be installed a number of years after the property has been built.

The result of this is that, if we were to agree on underground feeds throughout an area, the gardens, sidewalks, lawns and so on would have to be disturbed later in order to provide an underground cable feed when service is required. It is for this reason that we feel that the only way this is to be avoided is to insist that a pipe or duct be provided between the house-owner's property and the street or sidewalk at the time that the property is built: possibly in conjunction with the installation of the power or the water feed. It would appear, however, that the installation together with the power feed would be the answer.

In all this the property owner's rights must of course be respected; yet in the interests of the common good, which I submit we are attempting to satisfy, it is necessary that some measure of force, by not allowing alternatives to underground service provision, appears to be justified. It is not, in general, practicable to treat adjacent properties in different ways: one could not serve one property by means of an overhead feed and the next-door property by means of an underground service connection; simply because of the need to connect both services to the underground cable provided in the streets to the exchange.

Now, if we are not going to permit alternatives to underground feeding this means that some agreement must be arrived at between the municipalities

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and the Post Office; or, shall we say, between the rate-payers forming the municipality and the Post Office, to the effect that in a certain specific area all services will be underground.

The provision of telephone service, following much later than power or water, then requires that we would have to be able to reach the connection in the pipes provided between such a private property and the street, at some time later.

In general, apart from the benefits from the point of view of reduced fault liability and the aesthetic aspect, there are other advantages which would accrue. The reduced trenching and installation costs and outage times resulting from damage inflicted in the course of installation or maintenance work.

The provision of pipes would tend to protect cable from damage and would result in a reduction of outage time as also the employment of labour on restoration of faults caused on each other's plant.

It would have the advantage of an improved appearance of townships and also the reduction of damage to road and sidewalk surfaces; or a reduction in cost of re-instatement of surfaces, as the need for future trenching would be reduced.

Now, the details which would need attention, I would submit, are first of all, the subdivision of installation costs on public property and on private property. Secondly, co-ordination of planning of the required plant lay-out; the provision of materials and of

installation. Here I might just mention that one could perhaps think in terms of municipalities, in the course of the installation of cable on public as well as private property, providing a pipe at the same time for Post Office requirements. This would involve an arrangement for paying the costs of the provision of such pipes being arrived at on a satisfactory basis between the Post Office and the local authorities.

One should aim at an elimination of excessive administration costs arising from a complicated costing and charging procedure. The development of service access points both for above ground access to cables and terminal points at residences, as well as enactment of changes to either the Post Office Act or Municipal byelaws will need attention, to enforce or to ensure provision of pipes for telephone services on private property where required, simultaneously with the provision of power service connections.

Mr. President, I do not propose to take up more of your time with more details. May I suggest that, if the proposals I have outlined find broad acceptance by your members, the matter be taken further by appointing a sub-committee from your Association with the object of drafting, in consultation with the Post Office and such other authorities who may be concerned, proposals for consideration as a basis for co-operation between the Postmaster General and each individual municipality in the installation of underground plant within municipal areas.

Mr. P. J. Botes (Roodepoort), Mr. E. E. de Villiers (Bloemfontein), Mr. R. M. O. Simpson (Durban), Mr. E. B. Martin (Johannesburg), Mr. A. J. Loubser (Kimberley), Mr. H. G. Herbst (Mossel Bay) and Mr. I. F. Hobbs (Virginia) all indicated their support for the establishment of a committee but also indicated certain practical problems which they considered would arise. Mr. G. C. Theron (Vanderbijlpark) said:

The initiative in bringing this matter to the forefront came from the Post Office and I think we must welcome this move very much indeed—that Mr. Eggers came down from the Post Office to speak on this subject which is very close to his heart, as I have realised from earlier discussions. I should like to thank Mr. Eggers very much for coming down and putting the principle so clearly to us this morning.

In discussing a few details prior to this Convention, it became quite clear that the principle is probably acceptable to both the Post Office and the AMEU and the municipalities as such, but a lot of details will

Mnr. P. J. Botes (Roodepoort), Mnr. E. E. de Villiers (Bloemfontein), Mnr. R. M. O. Simpson (Durban), Mnr. E. B. Martin (Johannesburg), Mnr. A. J. Loubser (Kimberley), Mnr. H. G. Herbst (Mosselbaai) en Mnr. I. F. Hobbs (Virginia) steun almal die daarstelling van 'n Komitee, dog wys ook op sekere praktiese probleme wat na hulle mening kan ontstaan.

Mnr. G. C. Theron (Vanderbijlpark) sê:

still have to be sorted out. Apparently there is very big differences in present practice between the various areas, such as Natal, the Transvaal and the Cape, just to mention a few: and it is certainly going to be quite a big task to bring these various present practices together under one common code of practice. I want, however, to support the proposal which was made this morning very strongly, that a sub-committee be formed to iron out these details. I stress here again, that I think we must note that this proposal came from a Government department and we very much welcome co-operation of this nature.

In antwoord op die bespreking sê Mnr. A. F. W. H. Eggers:

to go into the details further, as to the ways and means of implementing the proposal.

In reply to the discussion, Mr. A. F. W. H. Eggers said:—

I'm very glad to hear that, in general, the reaction is favourable to the nomination of a sub-committee

As far as Mr. Botes' first point is concerned, it is at the moment the case that the planning of the installation of telephone services in new layouts does quite often lag behind the actual layout of the area provided with roads and so on. Whether it will prove possible to overcome this difficulty in the future I don't know. It certainly does appear that in putting together this sub-committee which will deal with this question, we should not only think in terms of electrical municipal engineers but also civil engineers—those people who are connected with the construction of roads.

To a certain extent this point was already covered by Mr. Simpson, where, in fact, this seems to be done in Durban; perhaps more easily there because the provision of power cables, provision of roads and the telephone service there virtually were controlled under one hat.

To deal with Mr. de Villiers' point, Mr. President: from a telephone point of view I do not visualize much difficulty in the way of provision of overhead feeds between a residence and out-buildings. This is not quite the same thing as it is with power; there is no danger because of the low voltage used, and as far as the unsightliness is concerned, this is the business of the property owner in any case. Thus as far as the Post Office is concerned I don't think it matters.

The question of the necessity of the telephone: in general I agree that the telephone is a necessity but it is not a necessity of life in the same way as power is for the purpose of cooking and the provision of water. It is purely from that point of view that I raised the question of the necessity of a telephone as compared with power and water.

The positioning of plant in roads, i.e., the relative position on sidewalks of telephone cables, power cables, water reticulation, water mains and sewerage and so on, is one which varies (as I think somebody else pointed out) from municipality to municipality throughout the country. It is also dependent on the standard widths of the sidewalks which are used and which also vary very widely from area to area. In Cape Town, for instance, in some areas the sidewalks are very narrow indeed; whereas in other areas such as, I think, Stilfontein is one, the sidewalks are very wide.

One could perhaps think in terms of a sub-committee drafting something in the nature of a code of practice perhaps which might in future have implications from a town planning point of view; I don't know.

Mr. Simpson's point regarding the difficulty of providing pipes in broken terrain and so on is taken. I accept that this is a situation; we will find positions where it is not practicable to provide pipes and where it will be necessary to lay cables. Our experience in the Post Office is that we do have quite a lot of damage to underground cable provided on private property. With our present system of distribution we have

quite large numbers of small cables laid between the streets and the back boundary line in private property and it does often happen that Jim Fish goes digging for a new shrub, a new tree or other odds and ends in private property and mistakes the telephone cable for a root, and that is the end of the cable! It would seem that if we do provide cables on private property rather than provide it in a pipe for protection, we should think in terms of increased depth—perhaps laying the cables at a depth of 3-ft. 6-in. or something like that, instead of a minimum depth of 2-ft. This is also a detail which I think can be considered further by the proposed sub-committee.

Mr. Martin raised the point of the provision of both services at the same time and I think this was also raised by Mr. Herbst. One of the snags that arises in co-ordinated installation of plant is the availability of material when you want it. It does happen that the power cable is available when the Post Office cable is not available; or alternatively possibly that Post Office cable is available when the power cable is not available: and those who have had anything to do with co-ordination of work between two autonomous bodies will know that this is a most difficult thing to organise.

It would seem far better (and this was the reason for the proposal) that we should lay a pipe for the telephone requirements at the same time that a power cable is installed. A pipe is relatively cheap and since we, the Post Office, feel that a pipe will not only serve as a means of getting the cable into the ground at some future date; it will also serve as protection of the cable and will provide a facility of increasing capacity or replacing existing cable at some time in the future without having to open the ground.

I agree that far as the laying of plant on private property is concerned, it is either a case of providing both cables (the power and the telephone cables) at the same time or, alternatively, a power cable and a pipe at the same time. The only objection that I can see to a cable being provided at the same time is that we don't necessarily use this cable immediately. In some cases, particularly where the telephone density in a particular area is of the order of 40% to 50% (we do get these sort of densities today) this cable would lie unused for quite a long time and could cause a spot of difficulty at the same time when connection is required in the future. Here again, I think this is a point which would have to be considered carefully and a compromise arrived at.

Mr. Loubser of Kimberley raised the question of the use of aerial cable: Mnr. Loubser, die gedagte is dat ons in die toekoms waar beplan is om telefone by wyse ondergrondse kables te bedien, dit deurgaans gedoen sou word en dat die gebruik van lugkables in sulke gevalle sou wegal. Ek moet hier beklemtoon dat hierdie gedagte op die oomblik een is waar ek eintlik tussen die duiwel en die diep water staan want ek het nog toestemming van die Poskantoor nodig.

Die posisie is eintlik dat die Posmeester-generaal nog die toestemming van die Minister sal moet kry vir die voorstel van die gebruik van ondergrondse kables, maar ek het geen twyfel nie dat, indien 'n komitee, soos voorgestel, ooreenkom dat dit die wyse is, die aangewese wyse is, om diens te verskaf, dat sulke toestemming van goedkeuring wel verkry sal word.

Mnr. Herbst van Mosselbaai se punt betref; ek dink ek het die vraag van die verskaffing van die kabel in verhouding tot die verskaffing van 'n pyp reeds beantwoord. Die doel van die Poskantoor is om telefoondiens te voorsien wanneer die vraag daarvoor

On the formal proposal of Mr. F. Stevens (Lady-smith), seconded by Mr. J. G. F. Erickson (Estcourt), it was resolved that the Executive Council appoint a sub-committee to proceed with investigations into the co-ordination of services with the Department of Posts and Telegraphs. The President expressed appreciation to Mr. Eggers for his attendance at the Convention.

Before proceeding with the agenda, the President advised that Mr. Jan Smith (Assistant General Manager of ESCOM, Johannesburg) had requested an opportunity of addressing the convention. Mr. Smith was invited to take the floor and he said:

"Mr President, gentlemen, yesterday, rather unexpectedly, you called upon me to say few words. At that stage I was not really prepared to say a few words because the first essential is that one must get one's facts straight and one must know the whole situation. I do not claim to know the whole situation now, but I do think it's completely incorrect to charge headlong into all sorts of decisions and observations, in the parlance of this Convention, like a bull at a gate!

Mr. President, this is my first Convention and I have found it most interesting thus far. What I particularly want to tell you and the gentlemen here (I've had the privilege of meeting a large number of the members of the AMEU) is that it has given me a very interesting picture and it has definitely changed some of my ideas about the AMEU, and I think this different picture I should convey to you.

When I arrived here at first I admit I was a little confused by the references to ESCOM, as I had constantly to determine whether this referred to ESCOM in South Africa or ESCOM in Rhodesia. As I say, I was getting a little confused and so, I think, were some of the speakers. As you realise, I can only speak on behalf of ESCOM South Africa, but I am not in a position to speak on behalf of ESCOM Rhodesia. I suggest that something be done to avoid this confusion at these meetings here—something like RESCOM: I don't know who is going to be RESCOM—either the Rhodesian one or the Republican one,

ontstaan en nie maande later nie. Die feit dat dit vandag nie moontlik is nie in 'n groot mate te wyte aan faktore buite ons beheer.

As far as Mr. Hobbs' point is concerned: there will be some money tied up in the ground in cable which is installed prior to being used, but in general this is not a serious matter. The cable ends, which would be put into private property, or the pipes which are provided into private property, are relatively cheap and, by comparison with the expenditure which would be involved if these were to be installed piecemeal at some future date, it would be insignificant.

Op 'n formele voorstel van Mnr. F. Stevens (Lady-smith), geseconde deur Mnr. J. G. F. Erickson (Estcourt), word besluit dat die Uitvoerende Raad 'n sub-komitee aanwys om voort te gaan met 'n ondersoek na die ko-ördinasie van dienste met die Departement Posen Telegrafwe. Die President betuig sy dank teenoor Mnr. Eggers vir sy teenwoordigheid by die Konvensie.

Voordat daar met die sakelys voortgegaan word, sê die President dat Mnr. Jan Smith (Assistent Algemene Bestuurder van Evkom, Johannesburg) toestemming gevra het om die Konvensie toe te spreek. Mnr. Smith se versoek word toegestaan en hy spreek die aanwesiges soos volg toe:

but of course that we can argue out afterwards.

At one stage in my confusion here, I thought I was at an Agricultural Conference. You know there was so much reference first of all to a "bull" and then to a "steer" and this bovine influence of course spread a lot further; there was a considerable amount of "chewing of the cud" as you noticed!

As ek net 'n paar verdere woorde daarby mag sê: u weet hierdie beesagtige element van die VMEQ het hier te vore gekom met 'n kwessie van „ou koeie uit slote graawe". Op daardie tydstop was ek juis so 'n bietjie ingedagte toe u my gister aanspreek; die spreker voor die tyd het voor daardie „O" (in die VMEQ se banier) gestaan en ek kon dit nie gesien het nie, en daardie vier letters het my regtig begin hinder. Ek het toe eers gewonder: het ek nou hier te doen met die „Verligte Munisipale Elektriese Ondernemings" of is dit 'n „Verkrampde Monopolie van Elektriese Ondernemings"? Teen gistermiddag, nadat ek met die mense hier gepraat het, Mnr. die Voorsitter, wil ek graag aan u sê, nou, na my mening is dit die „Verstandige Munisipale Elektriese Ondernemings!"

Mnr. die Voorsitter, voorts wil ek net baie graag die VMEQ (u kan maar u eie naam daarvoor gee; dit is nie belagrik nie) net verseker dat, van die oogpunt van EVKOM se bestuur, is daar baie duidelik 'n plek vir die VMEQ en vir EVKOM. Ons het altyd mekaar baie nodig; en EVKOM is bereid om hartlik saam te werk op alle vlakke. Meeste van u weet dit

is die posisie; miskien kry party van u die idee dat dit nie so is nie en enkele van die lede het vir my gevra of ek vergeet dat die VMEO groot is en dat daar allerhande soort mense is. Ons vergeet dit nie, Mnr. die President: EVKOM wil saamwerk op alle vlakke.

Vir Suid-Afrika is die verspreiding oor die algemeen, na ons mening, 'n plaaslike aangeleentheid en ons wil hê en ons wil graag sien dat dit so moet bly. Dis nie iets waarmee EVKOM hom graag wil inmeng nie.

Gister het ek baie kortliks verwys na die aspek van krag-ontwikkeling. Dit is 'n saak wat hoofsaaklik by EVKOM moet berus. Om hierdie argumente te herhaal is ook „ou koeie uit die sloot graawe” en met die besprekings met die lede hier, wat ek baie op prys gestel het, het ek gevind die mense is besonder goed ingelig, en dit is nie nodig om te herhaal nie dat vandag, met inter-konnessie, die bedryf van reuse termiese sentrales, intermediêre kragstasies daarby en toekomstige kernkragstasies, is dit uiters gesofistikeerd en sentrale beheer is 'n vereiste.

ESCOM and the municipalities functions from the point of view of power generation are complementary and **not** contradictory. Genuine co-operation and mutual trust and understanding are prerequisites. I venture to say that this is the case, but, Mr. President, I'll add that these bonds can be and should be strengthened.

The President thanked Mr. Smith for his very reassuring address.

Mr. A. A. Middlecote (SABS, Pretoria) then presented his paper "The Analysis of KWH Consumption Curves" which was published in Volume (1) of the 1969 Proceedings.

Mr. C. Lombard (Germiston), in proposing the vote of thanks to Mr. Middlecote, said:

I would like to congratulate Mr. Middlecote on his paperette, which is not only exceedingly interesting but also most welcome at a time when load prediction, both in the short and the long term, has become quite a problem in these times, due to the many interacting forces which are at play and which have an important bearing on load development.

The author has given us a clearer understanding of this problem by letting us see it in a much broader perspective than we normally do. He first of all suggests that the development of an area, region or country can be represented by a standard development curve which can be moved vertically to suit its ultimate development in terms of natural resources, and horizontally to fit in with the date at which development started.

Since kilowatt-hour consumption is a fair reflection

of development, he fits a tentative standard development curve to the actual kWh consumption curves. It is explained that deviations from the standard curve are caused by major events such as wars and depressions. It is finally suggested that, with the help of the standard curve, the actual consumption curves and an intimate knowledge of local history, the future trend of supply may be predicted with reasonable accuracy.

Some of you will say (and I must unfortunately refer to that) that there are some signs of anarchy. That is correct but they are really acoustic anachronisms. We have to remember that we are not living in the age of the Great Trek and that Queen Victoria died many years ago.

There is a great deal of important work that has to be done in South Africa, and for that matter in Rhodesia (I am confining myself, though, to South African aspects). We cannot afford the luxury of wastage; we cannot afford a wastage of man-power; we cannot afford a wastage of money; we cannot afford a wastage of resources and we cannot afford a wastage of the time of men that are competent to perform certain tasks, and they are difficult to come by — we all know that. We cannot waste time through fruitless arguments. An endless repetition of hackneyed accusations cannot prove any points.

Weerens wil ek net vir u sê dat ek dit besonder interessant gevind het om hier te verkeer en ek wil u die versekering gee dat EVKOM vir u toeganklik is op alle vlakke. Mnr. Price en ek vertoonwoordig u hier—I think our designations here are probably incorrect; you've labelled us as Johannesburg—our genuine interests stretch further than Johannesburg and we really represent ESCOM South Africa. However, under all conditions I would like to assure you that, in the spirit of co-operation, ESCOM is approachable.

Die President bedank Mnr. Sith vir sy baie geruststellende toespraak.

Mnr. A. A. Middlecote (SABS, Pretoria) lewer hierop sy referaat getitel „Die Ontleding van K.wu.-Verbruikerskurwes”, wat in Volume (1) van die Verrigtinge vir 1969 gepubliseer is.

Mnr. C. Lombard (Germiston) stel 'n mosie van dank aan Mnr. Middlecote voor en sê:

In the published paper there was not a clear explanation of how the standard curve was arrived at and it was therefore my intention to ask Mr. Middlecote to expand a little bit on this aspect. He has now done so in his resumé, for which I thank him.

I must also confess that I have considerable difficulty in understanding how the author arrived at the time displacements indicated for various centres

and authorities. Further enlightenment on this point would be appreciated: perhaps he has allowed himself a little bit of license there!

Apart from the factors mentioned by the author which could cause major deviations between the standard and actual curves, I would suggest that major advances in technology could possibly be a further factor.

It would also appear that, while a standard curve may be useful for long-term predictions, other methods would be more accurate in the case of short-term forecasts.

In recent years there have been many refinements in the forecasting process, and the method of merely extending the consumption curves based on historical data of total consumption, has now only a limited application. Such refinements include the analysing

In seconding the vote of thanks, Mr. P. J. Botes (Roodepoort) referred to the importance of utilisation of statistical curves in forward planning.

Mr. Middlecote replied to the vote of thanks.

The following written contribution to the discussion on Mr. Middlecote's paper was received from Mr. W. H. Milton (Honorary Member):

As we have come to expect, Mr. Middlecote has gone to a lot of trouble to draw our attention to the importance of the correct analysis of past data when endeavouring to forecast future events.

Prior to my retirement, this was one of the functions I was often called upon to undertake. As the author has indicated, a cursory analysis can be very misleading, and it is necessary to take into consideration factors external to the particular data of past performance in order to avoid error as far as is humanly possible.

My experience has, however, shown that the type of curve the author has suggested as a "standard", is not the best to adopt if long term estimating is to be reasonably close. In my experience, this type of curve has resulted in pessimistic forecasts, leading to an undesirable shortage of plant, without causing restriction on supply—fortunately—but at serious risk to continuity. When reviewed year by year, the plots on a single sheet looked like a feather with one side removed!

In my opinion, a straight line showing a fair average through the known points enables greater accuracy to be achieved. Such a line establishes the annual % rate of development, and deviations from the extended section into the future must then be assessed on probable effects of expected changes from the past pattern of development. In support of my

of the various load components, forecasting them individually and then combining them to give the total for the system. Yet a further refinement is the introduction of the probability dimension as applied to the component parts. It has even been suggested, in certain quarters, that historical data should be ignored so that the forecaster's mind would be uncluttered by the facts of past experience. I am pleased to note that the author does not suggest such a drastic change.

The author's holistic approach to the problem of load prediction has led to new insights and we look forward to him delivering a further paper in due course on the same subject.

Mnr. die President, dame en here, ek is seker dat Mnr. Middlecote se referaat heelwat bespreking sal uitlok en dit is dan vir my ook 'n besondere voorreg om 'n hartlike mosie van dank aan hom te stel vir sy uittmuntende referaat.

Mnr. P. J. Botes (Roodepoort) sekondeer die mosie van dank en verwys na die belangrikheid van die gebruik van statistiese kurwes wanneer daar vooruit beplan word.

Mnr. Middlecote antwoord gepas op die mosie van dank.

Die volgende geskrewe bydrae tot die bespreking Mnr. Middlecote se referaat is van Mnr. W. H. Milton (Erelid) ontvang:

opinion, the basic curve given by the author has been analysed, difficulty being experienced due to the small scale of the figures and the coarse lines used due to the requirements of block making.

A reasonably straight line to deal with the factual data may be drawn from just above point "A" through point "G". The deviation of fact from theory is then reduced very considerably below the "error" when comparing the author's curve with the facts on which his curve is based. His curve may be likened to an umbrella covering the data. Another aspect of the form of the basic curve is that it takes into account saturation effects which inevitably leads to a slowing up of growth to a final point of total saturation, when growth ceases and may even become negative due to a "poisoning" process that sets in. It seems to me that the curve should be "flattened out" to show saturation becoming noticeable after a much longer period of time than in the author's example. To be more definite, the author's curve in the region of "A", fig. 1, indicates growth at about 17.5% per annum (1910), while by 1970, the rate of growth has dropped to about 1.0% per annum (point "G"), which is too fast in reaching this condition—a lapse of only 60 years. The straight line I have mentioned indicates an average growth rate of about 7.4% per annum continuously.

I have also analysed some of the curves in figures

4 and 7 because they cover data with which I have been familiar. Looking at the curve for Natal in fig. 4, a straight line can be drawn through the section of the factual curve from about 1945 to 1962, and extended in both directions to examine deviations. That line indicates a steady development at the rate of about 7.45% per annum. In the early stages growth falls below the line. This has been accounted for by the author, but it also illustrates a feature which I have come to accept. The upward surge carried growth above the line by 1939 but settled back onto the line by 1945. In my experience the deviations from normal are only temporary, and setbacks as well as boosts are not of permanent duration unless caused by a major change such as a great change in the boundary of the area served, or the establishment of, say, a large industry using an amount of energy comparable with the total use before its inclusion. In such case the "line" must merely be raised, possibly at both ends by the amount used by the new industry (when the rate of growth thereafter is slowed down as a percentage per annum).

The curve for Border in this figure indicates an overall straight line rate of about 9% per annum, but from 1955 onwards the rate has dropped to about 7.2% per annum. In this case the extension of the system into outlying areas to pick up established loads distorted the rate in the earlier stages, a fact

The President next invited Mr. E. E. de Villiers (Bloemfontein) to introduce discussion on "The Utilisation of Bantu Labour".

Mr. de Villiers said that the subject which interested him was actually "The Training of Non-White Artisans" and that his object was to seek information more than to give it. He said:

I am not going to give you a lot of details; what I want to give you is really just a brief summary of the report that was brought out by our personnel department after they'd asked for information from various of our municipal departments.

Mr. de Villiers, dan sal ek net kortliks dié aan u voorlê en ek sal bly wees as daar miskien inligting of besprekings daaroor kan kom. Na aanleiding van 'n brief wat ons ontvang het van die Sekretaris van die Vereniging Munisipale Bestuur (ek dink u menere het seker almal dit ontvang) in verband met voorsiening van voldoende geriewe vir vakopleiding van nie-blank jeugdiges, is ondersoek by sekere departemente van die stadsraad ingestel omtrent die behoeftes aan werkgeleenthede vir opgeleide nie-blanke vakmense: en die moontlikheid van praktiese opleiding van nie-blanke vakleerlinge. Navrae is ook by die betrokke staatsdepartemente gedoen in verband met die opleidings-geriewe wat in hierdie verband

readily taken into account by the people most concerned and therefore easily corrected in placing the straight line for future prognostication.

Figure 7 is most interesting, as it illustrates important aspects of the use of these curves. Cape Town's data between 1920 and 1938 approximated 13.7% per annum growth. Thereafter the growth rate dropped to about 7.8% per annum, with a marked deviation commencing about 1952 and continuing till about 1960. After 1960, the rate has restored to about 6.9% per annum. The opinion has been expressed that this has been due to the use of much of the available industrial land having been taken up, with the result of continuing industrial development taking place just outside the boundary, and even to the extent of some land desirous of developing, moving its basic load outside so as to incorporate all activity on one site. Here one sees the onset of saturation, diminished by vertical development when lateral expansion is restricted.

In the light of the foregoing, I feel sure that the type of curve suggested by the author should only be adopted in extremely long term studies, and for periods of say 10 to 20 years the straight line method is more readily adjusted for expected changes in influential factors. Until recently a development rate of about 7% per annum has been applicable in general and it may remain so for a long time.

Die President vra hierna Mnr. E. E. de Villiers (Bloemfontein) om „Die bespreking oor die Gebruik van Bantu-arbeid" in te lei.

Mnr. de Villiers sê dat die onderwerp waarin hy belangstel, „Die Opleiding van Nie-Blanke Vakmense" is en dat hy verleer self inligting soek as om dit te verskaf. Hy sê:

voorsien word en met die beskikbare inligting ter hand word die aangeleentheid dan soos volg kortliks opgesom.

Ek behandel dan eerstens die behoeftes aan werkgeleenthede vir nie-blanke by sekere departemente van die Bloemfontein se stadsraad;

Wat **bouwerks** betref het die Siviele Stadsingeneur die volgende aan ons voor gelê: die Departemente van Bantoe Administrasie het alle selfbou skemas vir Bantoes in stedelike gebiede gestaak en slegs munisipaliteite of bou-kontraakteurs wat huise in lokasies mag bou, kan Bantoe bouwerkers in diens neem. Dit word ook bepaal dat Bantoe bouwerkers nie buite die Bantoe dorpe as vakmense in die boubedryf in diens geneem mag word nie.

As gevolg hiervan is daar reeds 'n ooraanbod van gekwalifiseerde Bantoe bouwerkers in Bloemfontein en dit is die ondervinding dat sommige van hulle

werkloos is; of by werkgewers as gewone arbeiders, of vragmotor bestuurders werk.

Die Stadsingenieur het egter geen beswaar dat nie-blankes in verskillende ambagte deur hulle eie mense opgelei word nie, maar as gevolg daarvan dat die nie-blanke ingenieursafdeling nog in die beginstadium van ontplooiing is, (ek kan net terloops sê, Mnr. die President, dat dit is 'n nuwe onderafdeling wat direk resulteer onder die Bestuurder van Nie-Blanke Sake; dat hulle ook hulle eie ambagsmanne het wat die bouwerke onderneem) beskik hierdie afdeling net nie oor sodanige fasiliteite om vakleerlinge in diens te neem nie.

Ek noem hierdie saak dan want dit hang ter nouste saam met die kwessie van ander vakman opleiding. Wat die **Elektrisiteitsdepartemente** betref het ons soos volg verslag gedoen:

Hierdie Departemente is van mening dat nie-blanke vakmanne met vrug geruik kan word as lyn- en draadwerkers in die Bantoe dorpe onder toesig van 'n verantwoordelike blanke persoon. Wat substansies and kabelwerk betref is die tyd moontlik nog nie ryp daarvoor nie. Daar sal egte 'n groot behoefte wees aan hierdie tipe vakmanne indien die stadsraad sou besluit om die elektriese bedrading van nie-blanke wonings te onderneem.

Mnr. die President, om hierdie stadium was die mening uitgespreek dat dit die beleid van die Departement van Nie-Blanke Sake is dat die Republiek tot 'n groot mate opleiding van nie-blanke vakmanne moet doen sodat hulle in hulle eie gebiede sodanig kan gaan optree en werk verrig.

Nou die kwessie van die voorsiening van opleiding volgens inligting wat ons gekry het. Eerstens die **teoretiese opleiding**: wat Kleurlinge betref — (u weet Bloemfontein — nie so groot soos die Kaap nie, maar dit is interessant om dit te noem). Dit is die beleid van die Departemente van Kleurling Sake om beroepsgerigte kursusse by sentraal geleë, meerstromige hoërskole in te stel. Wat die **tegniese rigting** betref is die basiese standaard ses kursus teen die begin van 1966 reeds by die volgende hoërskole ingestel. Dit is dan hoërskole te Esselenpark in Worcester, Môrester, Oudtshoorn; Gelvendale, Port Elizabeth; Floors, Kimberley; Spes Bona, Athlone, Kaapprovinsie.

Vakopleiding vir seuns in die ouderdoms-groepe 14—18 jaar word ook aangebied by die St. Joseph Vakskool, Aliwal-Noord. Die volgende Beroepskole

van die Departemente maak vir die opleiding van vakleerling voorsiening: die Beroepskool in Kaapstad — die is Harringtonstraat, Kaapstad; Beroepskool in Port Elizabeth; daar is 'n Beroepskool in Johannesburg, Heronmeerweg, Booysens; in Durban en daar is een; en die A. C. Elliotberoepskool, in Kimberley. Gevorderde tegniese onderrig word aangebied by die Skiereilandse Tegniese Kollege van Bellville.

Nou, wat die **teoretiese opleiding** van Bantoes betref het ons die volgende inligting. Die naaste ambagskool vir vakopleiding vir Bantoe seuns aan Bloemfontein is die Maroko Ambagskool, Privaatstak X10, Thaba 'Nehu (vir ander sentra sal dit natuurlik baie nader wees as ons), wat 'n twee-jarige kursus in betonmessel en pleisterwerk aanbied, asook in loodgieterij, riolering, plaatmetaalwerk, meubelmakery en skryfwerk. Dit is natuurlik nou nie wat ons direk raak nie.

Wat ons wel raak is die opleiding as elektrisiëns in huisbedrading: hoofsaaklik huisbedrading word by die volgende ambagskole aangebied: Pokwani in Pietersburg; Edendale, Sekoleni in Natal; Umlazi in Isipingo in Natal. Die volgende Tegiese Sekondêre Skole bied gevorderde opleiding in boukonstruksie, motorwerktuigkunde, houtwerk, loodgieterij en ander vakke, maar ook elektrisiteit: Jabulani in Kwaksuma, Johannesburg; Vlakfontein in Silverton, Pretoria; ook weer Edendale; Sekoleni in Natal; en New Brighton, Port Elizabeth. Dit dan wat die teoretiese opleiding betref.

Van die praktiese opleiding het ons die volgende notas gemaak: die hoofde van ons betrokke departemente voorsien op hierdie stadium geen probleme om vakleerlinge in diens te neem nie, mits die nodige fasiliteite geskep word en daar ook oor voldoende gekwalifiseerde Bantoe vakmanne beskik word om sodanige opleiding waar te neem.

Mnr. die President, dit is natuurlik 'n probleem wat u almal sal ondervind, dat ons selfs nie genoegsame blanke ambagsmanne het nie. Dit is 'n wesenlike probleem wat moontlik dié saak vir 'n onbepaalde tyd magverongeluk.

Die stelsel van blok-klasse waar vakleerlinge aaneenlopend vir drie maande van die jaar teoretiese opleiding ontvang, kan bes moontlik in hierdie opsig ook gevolg word.

Mr. President, this is what I have to put before you; I hope this will stimulate members into giving their views and thus we could get further information.

Die President betuig sy dank aan Mnr. de Villiers vir sy bydrae tot die verrigtinge.

The President expressed appreciation to Mr. de Villiers for his contribution to the proceedings.

4th Day, AFTERNOON SITTING

Mr. J. C. Wannenburg (Pretoria) presented his notes on the interpretation of certain sections of the Factories, Machinery and Building Work Act, 1941, as amended, the Electrical Wiremen and Contractors' Act and the regulations framed under the respective Acts, which were published in the 1969 Proceedings of the Association, Volume 2(a).

The next item on the Agenda was the valediction and the President introduced Alderman W. M. Steer of Salisbury.

Alderman Steer reviewed the part that Salisbury had played in the power supply in Rhodesia and in the affairs of the Association. He mentioned that it appeared that the first reference to Rhodesia in the annals of the Association was in 1926, and at the Eighth Convention held in East London in 1927 those attending included C. H. Baskerville of Salisbury and R. A. Young of Bulawayo.

In the absence of Alderman Payne of Bulawayo, who was to have addressed the Convention, Alderman Steer referred to some of the early history of electricity supply at Bulawayo and to the fact that, whilst it was in 1878 that the idea of distributing energy by means of electricity came into being, only 19 years later there was a power station operating in Bulawayo.

At the conclusion of Alderman Steer's address, the President asked Mr. A. R. Simpson (Honorary Member and Past President, Bulawayo), who had arrived at the Convention that morning, to say a few words. Mr. Simpson referred to the close ties in the electrical field between Rhodesia and the Republic of South Africa, as well as to his own affiliation with the South. He concluded by referring to the fact that there were many at the Convention that day who were approaching the phase in life of retirement, which he experienced seven years previously. He said that it had been a great joy to meet old friends again.

CLOSING SESSION

At the opening of the session the President referred to the news which had just been received of the passing of a former Mayor of Johannesburg, Councillor Peter Roos. The Convention stood in silence in his memory.

The President submitted proposals by the Executive Council to grant honorary membership of the Association to Past President E. J. Hugo, Mr. J. Wilson, Mr. E. L. Smith, Past President D. Murray-Nobbs and Mr. P. A. Giles. The proposals were received with acclamation.

4de Dag, NAMIDDAGSITTING

Mnr. J. C. Wannenburg (Pretoria) lewer kommentaar oor die vertolking van sekere klausules van die Wet op Fabriek, Masjinerie en Bouwerk, 1941, soos gewysig, die Wet op Elektrotegniese Draadwerkers en Aannemers en die regulasies wat ingevolg die onderskeie wette opgestel is. Die kommentaar is in Volume 2(a) van die Verrigtinge vir 1969 gepubliseer.

Die volgende item op die sakelys is die afskeidswoorde en die President stel Raadsheer W. M. Steer van Salisbury aan die woord.

Raadsheer Steer gee 'n oorsig van die rol wat Salisbury in die kragvoorsieningsnywerheid in Rhodesië en in die sake van die Vereniging gespeel het. Hy sê dat dit wou blyk asof eerste verwysing na Rhodesië wat in die annale van die Vereniging voorkom, in 1926 was, en onder diegene wat die 8ste Konvensie in Oos-Londen in 1927 bygewoon het, was Mnr. C. H. Baskerville van Salisbury en R.A. Young van Bulawayo.

In die afwesigheid van Raadsheer Payne van Bulawayo, wat die Konvensie sou toespraak het, verwys Raadsheer Steer na sekere aspekte van die vroegskiedenis van die verskaffing van elektrisiteit in Bulawayo en na die feit dat, terwyl die idee van die verspreiding van energie in die vorm van elektrisiteit vir die eerste keer in 1878 ontstaan het, daar slegs 19 jaar later reeds 'n kragentrale in Bulawayo in werking was.

Na afsloop van Raadsheer Steer se toespraak, vra die President Mnr. A. R. Simpson (Erelid en Gewese President, Bulawayo) wat die oggend by die Konvensie opgedaag het, om 'n paar woorde te sê. Mnr. Simpson verwys na die noue bande wat daar op die gebied van elektrisiteit tussen Rhodesië en die Republiek van S.A. bestaan, asook na sy eie verbintenis met die Suide. Hy sluit af deur te verwys na die feit dat daar vandag baie persone by die Konvensie teenwoordig is wat die fase in hul lewens nader wat hy self sewe jaar gelede beleef het, nl. hul aftrede met pensioen, en hy sê dat dit vir hom 'n groot vreugde was om weer so baie ou vriende te ontmoet.

SLUITINGSSITTING:

Aan die begin van die sitting verwys die President na die nuus wat so pas uit Johannesburg ontvang is van die heengaan van 'n voormalige Burgemeester van daardie stad, Raadslid Peter Roos. 'n Mosie van deelname word staande deur die Konvensie aanvaar.

Die President lê voorstelle van die Uitvoerende Raad aan die Konvensie voor, nl. dat ere-lidmaatskap van die Vereniging toegeken word aan oud-President E. J. Hugo, Mnr. J. Wilson, Mnr. E. L. Smith, oud-President, D. Murray-Nobbs en Mnr. P. A. Giles. Die voorstelle word met toejuiging begroet.

Mr. E. A. McWilliam (Pretoria) referred to the granting of honorary membership to Messrs. Hugo and Wilson and said:

I am very proud to say a few words about Mr. Dirk Hugo and Mr. John Wilson, who served the Electricity Department of Pretoria for a period of very nearly 40 years. During that period they were closely associated with the work of the AMEU, which they served in their usual quiet and retiring ways.

Mr. Hugo became City Electrical Engineer of Pretoria in 1937, and at the same time Mr. John Wilson became the Deputy City Electrical Engineer. Prior to that, of course, we had the Convention in Pretoria in 1936 (Pretoria has not been a famous place for conventions) and I can assure you that I know from personal experience that both Mr. Wilson and Mr. Hugo played a very important part in that Convention.

Then later Mr. Hugo became the President (1955—1956), when the Convention was again held

Mr. Dirk Hugo's son, Tony, accepted from the President the insignia of honorary membership on behalf of his father and Mr. McWilliam accepted on behalf of Mr. John Wilson.

Mr. A. H. L. Fortman (Boksburg) referred to the granting of honorary membership to Mr. E. L. Smith and said:

Mr. E. L. Smith has been a member of this Association for many years and is well-known to most members here; especially to the members of the Highveld Branch of the AMEU.

He was a dedicated Electrical Engineer, always endeavouring to improve the stature of the electrical engineer, especially the municipal electrical engineer.

—Les retired on August 3, 1968, after 23 years service as Town Electrical Engineer of Boksburg and is now enjoying his retirement at Amanzimtoti on the Natal South Coast.

Prior to the position of Town Electrical Engineer of Boksburg, he was Town Electrical Engineer of Burgersdorp in the Cape Province.

Les has certainly left his mark in this Association and especially in the Highveld Branch of the AMEU, and has made valuable contributions to this Association in various aspects. He was a Founder Member of the Rand Association of Municipal Electrical Engineers, which later became the Highveld Branch. Les was proud of this fact and he often told me that he was responsible for starting the Rand Association of Municipal Electrical Engineers, when way back in the 1940's he started get-togethers between two or three engineers of the neighbouring East Rand towns. These meetings of municipal electrical engineers

Met verwysing na die toekenning van ere-lidmaatskap aan Mnr. Hugo en Wilson, sê Mnr. E. A. McWilliam (Pretoria):

in Pretoria. Mr. Hugo retired in 1967 after 30 years service.

In the case of Mr. John Wilson, he became a member of the Association during his period as Deputy City Electrical Engineer and then, unfortunately, he was only the City Electrical Engineer of Pretoria for a relatively short period and he also retired in 1967. Mr. Wilson of course, has been responsible for, he has worked on behalf of the AMEU. He took over the work that had previously been done by Mr. Horrell, viz., the work of collecting all the details, all the information, that you gentlemen here send in about the electrical undertakings of the AMEU. Mr. Wilson collects all that information and compiles all the tables which appear in the Municipal Year Book.

I am quite sure that these two gentlemen will be very honoured to be made Honorary Members of this Association.

Mnr. Dirk Hugo se seun, Tony, ontvang namens sy vader van die President die ordetekens van ere-lidmaatskap, terwyl Mnr. McWilliam dit namens Mnr. John Wilson in ontvangs neem.

Met verwysing na die toekenning van ere-lidmaatskap aan Mnr. E. L. Smith, sê Mnr. A. H. L. Fortman (Boksburg):

eventually incorporated all the towns and cities along the Reef, and when the Rand Association eventually became the Highveld Branch of the AMEU in 1962, I think he must have been a little sad. This, incidentally, was the "mother" of the rest of the AMEU branches throughout South Africa.

Les was Honorary Secretary of the Rand Association for the period 1947—49 and again for the year 1953/54. He was Chairman of that same branch in 1950/51. He represented the AMEU on numerous committees for the preparation of SABS specifications, and was the Convenor of the Committee responsible for the drawing up of the proposed Standard Electricity Supply Bye-laws for the Transvaal. No finality has yet been reached on these bye-laws and I am sure he must have been disappointed not to have seen the results of his efforts before retiring.

I should like to mention that Mr. Smith was not a big apostle of earthing and wondered where it would all end—with more and better earthing of just about every conceivable thing that could be earthed? Later came the earth leakage relay. He likened this business of earthing to a man riding a bicycle and said that you must pedal and keep on pedalling lest you fall.

If Les could have been here today and heard what Mr. Middlecote had to say about the investigation into this problem of earthing and that there may be certain relaxations, I am sure this would have met

Mr. Fortman accepted the insignia of honorary membership on behalf of Mr. Smith.

Mr. R. Leishman (Johannesburg) referred to the granting of honorary membership to Mr. D. Murray-Nobbs and said:

It is a great pleasure to me to put forward the proposal to this Institution that Mr. David Murray-Nobbs be elected an Honorary Member. Mr. Murray-Nobbs was a real Clydeside Scot; he was brought up in the shipyards of the Clyde. Having learned how to build ships, he then went to sea in order to keep them running. He was typical of a Scot, of course, in that he was finding out in what part of the world he should step off the boat in order to make his fortune, and that place turned out to be South Africa.

As is so common in the operating personnel of the Victoria Falls and Transvaal Power Company, (as it was then), Mr. Murray-Nobbs found his first occupation in the operating side with the V.F.P. on the Witwatersrand: and when he had elevated himself to the post of a shift superintendent, he saw the real light and he came to the Golden City of Johannesburg as a shift superintendent.

Mr. Nobbs worked with us for some years and he left us to go to Port Elizabeth, having achieved the rank as an Assistant Station Resident Engineer.

Mr. R. S. Dunstan (Port Elizabeth) accepted the insignia of honorary membership on behalf of Mr. Murray-Nobbs.

Mr. R. W. Barton (Welkom) referred to the granting of honorary membership to Mr. P. A. Giles and said:

It is a great privilege and pleasure for me to propose that Honorary Membership be granted to Percy Giles. As you have said, Mr. President, he is as large as life, in fact slightly larger, so I won't have to tell you very much about his pedigree!

I first met Percy in 1948 at the Convention held then in East London. He was Deputy City Electrical Engineer at that time and he read a most interesting paper on the local power station, which, needless to say, has long since passed into the happy land of ESCOM.

In 1962 Percy had succeeded Mr. Foden as City Engineer and he was in that year President of our

with his wholehearted approval.

Les was well in the forefront of modern developments and when a paper on minisubs was read in Johannesburg, Boksburg was already installing them!

Mr. Fortman neem namens Mnr. Smith die ordetekens van ere-lidmaatskap in ontvangs.

Mnr. R. Leishman (Johannesburg) verwys na die toekennings van ere-lidmaatskap aan Mnr. D. Murray-Nobbs en spreek die aanwesiges soos volg toe:

He went to Port Elizabeth in 1947 as a Generation Engineer at the Mount Road Power Station.

It will be recalled that, somewhere about 1951 or '52, ESCOM built a power station at Swartkops with which Mr. Murray-Nobbs had something to do—I think he was the original Resident Engineer at that Power Station. However, in the course of time it was sold to the Municipality of Port Elizabeth and Mr. Murray-Nobbs returned to the Port Elizabeth Municipality after a short period with ESCOM, as the City Electrical Engineer designate.

In 1955 his appointment as City Electrical Engineer was confirmed and he held that office until his retirement something like 18 months ago.

All of us will remember vividly his 1965 Convention which marked the 50th birthday of this Association; all of us will remember the confidence with which he guided that Convention.

Mr. President, I don't think I need say how much Mr. Murray-Nobbs has contributed to the interests of this Association and to municipal engineering generally."

Mnr. A. S. Dunstan (Port Elizabeth) neem die ordetekens van ere-lidmaatskap namens Mnr. Murray-Nobbs in ontvangs.

In verband met die toekennings van ere-lidmaatskap aan Mnr. P. A. Giles, sê Mnr. R. W. Barton (Welkom):

Association, and we held a most enjoyable Convention in East London.

Since 1955 Mr. Giles has served on the Executive Council continuously; he has served on many committees with distinction; he has been convener of committees in most cases and he has done invaluable work for the Association, and indeed for the whole country, Mr. President.

The other thing we particularly remember him for is his competence, in fact his brilliance at times, as Quizmaster of Members' Forum. He gave us some very enjoyable sessions.

He has left municipal service now and has gone to the Department of Bantu Administration in Pre-

'toria, where I hope he can be of considerable use to some of us in the future.

The thing though that I think he will be most

The President then presented Mr. Giles with his insignia of honorary membership.

The President next presented a Past President's medal and certificate to the immediate Past President, Mr. G. C. Theron, and referred in doing so to his outstanding service to the Association.

The Convention was next addressed by Mr. C. N. Gaunt (Johannesburg) who said:

I have in the past listened to many speakers who were invited to say "a few words" and when they opened with, what an honour it has been for them to be so invited, I have thought, "How trite!" And yet when I was invited to express a vote of thanks on behalf of the Affiliates, my first reaction was, "Why should I be so honoured?" It is indeed an honour.

Mr. President, this is third occasion on which I have been afforded an opportunity of partaking of Umtali's hospitality. The two earlier opportunities were when the Rhodesian Institution of Engineers held Symposiums here and Umtali Municipality graciously entertained us: but on this occasion they have, as the saying goes, really "gone to town".

To my fellow Rhodesians Umtali has two claims to prominence: it is a convenient half-way stop from Salisbury to Beira, and so Rhodesians know it as a place for a quick bite of lunch on their way to the sea. Also the town is the centre of Rhodesia's premier holiday resort, the Eastern Highlands; and holiday-makers at Inyanga and the Vumba take the opportunity to drop in as a change from country walks, trout fishing, golfing, etc.

Most of the people today, however, are from

Mr. Gaunt concluded by saying:

Mr. Mayor, to all of us this visit has been an eye-opener. Your hospitality has been unbounded and we have thoroughly enjoyed ourselves. In the words of the present younger generation, "It has been fab!" And so it gives me great pleasure and honour

Proposing a vote of thanks to the host town, Councillor H. Boneschans (Germiston) said:

I have been invited on behalf of all delegates to this Convention to propose a vote of thanks to our hosts, the town of Umtali. I feel a little diffident, but at the same time proud, of this opportunity of speaking for such a distinguished gathering of dele-

remembered for, is his well-known invention of the everlasting cigar! Now, since 1948 Percy has not changed at all, to my mind, and neither has his cigar!

Hierop oorhandig die President Mnr. Giles se ordetekens van ere-lidmaatskap aan hom.

Die President oorhandig hierna die medalje en sertifikaat van Oud-presidente aan die pas-afgetrede President, Mnr. G. C. Theron, en verwys na die uitstaande dienste wat deur laasgenoemde aan die Vereniging gelewer is.

Voorts word die Konvensie soos volg deur Mnr. C. N. Gaunt (Johannesburg) toegesprek:

South Africa and to most of them Umtali may have been a name on the map, a town on the border between Rhodesia and Mozambique—if they had the energy to look at an atlas. But these last few days we have learnt that there is much more to Umtali; to our surprise it is an industrial centre. Here in the midst of mountains and forests we find, for example, a Paper Industry, a Timber Industry, a Carpet Factory and, had it not been for sanctions, a thriving Motor Industry; and many more.

We find that Umtali is ideally placed as the Eastern Gateway to the markets of the world. There is an excellent road and railway to the port of Beira and to Salisbury, and there is easy communication to that rapidly developing area once despised as unfit for human habitation, but now fast becoming the granary of this country, the Lowveld. Umtali provides a vital link in all this industry, and we have been surprised to find how busy the town is behind the scenes.

The accommodation of all the delegates and their wives, approximately 400 in all, must have provided quite a headache for the organisers; that they did it with apparently no resulting fuss is indeed a feather in their cap.

Mnr. Gaunt sluit af deur te sê:

to express on behalf of the Affiliates to you, Mr. Mayor, Mr President and members of the AMEU our thanks: and in particular to those hard-working few, our congratulations on a most successful Convention.

Raadslid H. Boneschans (Germiston) stel 'n mosie van dank aan die gasheer-dorp voor en sê:

gates. But I feel confident that I am voicing the feelings of every one of us when I say that this has been a most enjoyable and memorable Convention in this eventful time for Rhodesia; and we would like to express our sincerest gratitude to His Worship

the Mayor, the Mayoress, Councillors and officials of Umtali, and the people of Umtali who have done so much to make this possible. Your arrangements were superb; co-ordination and co-operation out of this world. Many of us have at some stage in the past been concerned with arrangements for a convention of this nature, and we are fully aware of the expense, effort and sacrifices which are required behind the scenes.

In this instance it is obvious that our hosts went even beyond these requirements to ensure the great success which has been achieved here. For this we are very and truly grateful. I wish to make special mention also of the wonderful team work which was so evident between the AMEU and our hosts. Yes,

He continued :

Mr President, Umtali reminds me very much of Pretoria—the setting is very similar. Today we see the result as a beautiful town with a happy and friendly, broad-minded people capable of and willing to welcome their guests not only in their own language but also in Afrikaans. In doing so you made us feel

Councillor Boneschans concluded by referring to the momentous decision to be taken by Rhodesia the next day (the day of the Referendum) and trusted that the outcome would be to the benefit of all.

In proposing a vote of thanks to the ladies, Mr. John Morrison (Johannesburg) said :

In the words of the immortal historian, "O femini pulcherimi ductoris virorem" which, when **freely** translated (to enable us to have the proceedings in three languages!), means 'to these goddesses of love, these sweet seducers, these female members of the human race, all glory and honour! How wise was Cicero to acclaim **our** ladies in such glowing terms, and how true his words.

Indeed, one often wonders with such paragons of virtue in constant attention, why the other half of the race (that is the ones with the missing ribs!) really exist at all! And yet I have it on the strongest authority that there is something about us men that the ladies find devastatingly attractive! Could it be the sense of conquest of the gay and carefree single man, flush with money and full of evil intentions; or the mothering instinct displayed to the middle-aged bachelor, so often described as a thing of beauty and a boy forever! Is it, do you think, the recognition of the higher sphere of intellect found in the male who, not always right, is seldom known to admit being wrong; or the care that we give our ladies in ringing them up at midnight to say that we are still with the boys and not to wait supper!

Mr President, unity is really strength.

Although we have undoubtedly derived great benefit from our deliberations here during the past few days, I feel sure that most of us will not remember this Convention as our Forty-First Convention, we will rather remember it and refer to it as the Umtali Convention.

We will remember this beautiful town with its lovely Civic Centre and magnificent setting in scenic mountains. We will certainly remember the people who live here, our many friends, and their spontaneous hospitality and sincere friendliness; as pure and striking as their green and white flag which we so much admire and envy.

Hy gaan voort deur te sê:

immediately at home.

So Mr President, Mr Mayor, ladies and gentlemen, once again on behalf of us all and our wives, and with words which seem grossly inadequate but which come straight from the heart, we say to our hosts, "Thank you, Umtali."

Raadslid Boneschans sluit af deur te verwys na die ingrypende besluit wat die volgende dag (die dag van die volkstemming) deur Rhodesië geneem moet word, en spreek die vertroue uit dat die uitslag van die stemming tot almal se voordeel sal strek.

Mnr. John Gaunt (Johannesburg) stel 'n mosie van dank aan die dames voor en sê:

Anxious to find the solution I asked my glamorous but completely dumb secretary how she sized up men. For a couple of minutes there was a deathly silence and then her brow assumed a furrowed look, her eyes turned heavenward and a sort of tuneless humming indicated that she was deep in thought. "Well," she said, they come in three kinds: there are the one going bald in front, they are the thinkers; and then there are the ones going bald at the back, they are sexy; and those bald front and back just think they are sexy!"

In defence of the younger members of this Association who, like myself, are beginning to 'show through' on top, I felt that there must be a more stable criterion than the basic thoughts presented by my blonde bountiful, and resolved that if only I could find the solution, the reason for this magnetic attraction between sexes, my name might forever be installed in the annals of the New Products Committee! And then it came to me like a flash. I cast my mind back some 2,500 years and remembered that it was the ancients who first discovered magnetism when they found that, by rubbing an amber stone, they could attract little bits of fluff; and you know

we men have been using precious stones for this purposes ever since!

Here then was the solution to the problem—induced electricity! Flushed with success and anxious to take the point further. I called on the high authority Mr Mac Diddlecote and his hippie band of South African Beer Samplers (SABS) to carry out a highly scientific experiment. It involved two turkeys; one male, one female; and in the love areas of the brain of the male were inserted minute electrodes, which were activated by a small battery strapped on his back. In due course he was introduced to his lady, but, being a male of vain disposition, he spent the next couple of hours stumping up and down preening his feathers; at which stage the current was turned on. The magnetic attraction affected and feathers flew fast and furious. Here then I had proved my point—that the very basis of love was electricity: like so many other of my brilliant inventions, there was shown to me the other side: the ominous implications of which struck fear into my very soul! For

Before the President's closing speech to the Convention, tokens of appreciation for their assistance were presented to the following:

Mrs. Elizabeth Hill, Mrs. Cath Irvine, Mrs. Molly Truscott, Miss Elaine Brewin, Mrs. Joyce Bradfield, Mrs. Sylvia v. d. Walt, Mrs. Beulah Britton, Mr. Colin Webb, Mr. Jack Burke.

The President then said:

The success of a large convention such as this, and by all accounts it would seem to have been a highly successful one, depends on the efforts of many people. This has been the more so here in Umtali, where the satisfactory resolution of the many problems involved, particularly with transport and accommodation, associated with the influx of over 400 delegates into our midst from the four corners of Southern Africa, has been no mean achievement.

On behalf of the Executive Council of the AMEU it is firstly my very pleasant duty, Mr. Mayor, to thank you and your charming wife the Mayoress, for all that you have both done to ensure that the many delegates here today will take back home with them warm and enduring memories of their stay in Umtali. To the Town Council of Umtali I would reiterate both my own and my Executive Council's appreciation, not only for their making it possible to hold this Convention here in Umtali, but also for their generosity and assistance in so many ways.

When I was elected your President-Elect two years ago at Lourenco Marques, it was with some alarm and trepidation that I considered the prospect of this high office which you have so honoured me with this week in Umtali. This fear was heightened

in finding the mechanics of love I had destroyed romance and the happy days of sweet seduction. Indeed, in future our ladies would no longer have to resort to such amorous aids as Chanel No. 5, soft lights, sweet music and the plunging neckline of a gownless evening strap! All they would have to do for romance, Mr President, would be to take us men home, plug us in and switch us on!

Mr President, I feel I must now publicly disassociate myself with this Frankenstein experiment and speak on behalf of the many anxious men here present in imploring our ladies, our beautiful ladies, to turn their backs on science; to shun the advancements of this modern age and to take up once more their rightful role of goddesses of love and sweet seducers of men! And in thanking them all for gracing this our Conference, may I speak on their behalf and say a great word of appreciation to the Mayoress for the wonderful things that she has done to make their own life in Umtali such a pleasant one.

Voordat die President sy slotrede aan die Konvensie lewer, word blyke van waardering vir hulle hulp aan die volgende persone oorhandig:

Mev. Elizabeth Hill, Mev. Cath Irvine, Mev. Molly Truscott, Mej. Elaine Brewin, Mev. Joyce Bradfield, Mev. Sylvia van der Walt, Mev. Beulah Britton, Mnr. Colin Webb en Mnr. Jack Burke.

Hierop sê die President:

by the fact that the then President, Mr. Hawie Theron, impressed me as being one of those strong, stern and silent fellows who gets on with the job with maximum efficiency coupled with the minimum of fuss. However, over the past two years I have got to know another side of Hawie. With his undoubted penchant for hard work and efficiency goes a most engaging and cheerful disposition and these attributes of his and his wise and knowledgeable counsel, freely imparted on all matters pertaining to the affairs of this Association, I found of inestimable value during my period as President-Elect. Thank you very much Mr. Past President and I sincerely trust that both you Hawie and your delightfully charming wife Jireh will grace our Conventions with your presence for many years yet to come.

Having attended AMEU conventions for more years than I care to remember, I find I have to go a very long way back indeed to recall an AMEU Convention without the ubiquitous presence in our midst of Mr. Dick Ewing, our worthy Secretary. Thus it has come about in the making of history that an AMEU Convention without Dick Ewing would be like Hamlet without the Prince. His has been the guiding spirit which has led to the success of this

Convention, as it has been for many other previous such occasions and indeed for the smooth running of all the other activities associated with the AMEU. I would commend to future Presidents, as I am sure Past Presidents would readily agree, that in their more harassed AMEU moments a problem can safely and cheerfully be passed to Dick Ewing, who, like Mr. van Wyk's CSIR computers, will just as quickly come up with the right and happy answer. Insofar as the success of the social side of the Convention is concerned, I would like to pay a similar tribute to Mrs. Dick Ewing, or Joy as most of us have come to know her.

It became evident early on that a local organisation of the AMEU would require to be set up here in Umtali if the 41st AMEU Convention was to be of the standard previously attained in other centres. My Council, most fortuitously and happily as it eventually proved to be, engaged the services of Mr. Jack Burke, himself a well known and retired engineer settled in this town, to cope with this work in close liaison with our Secretaries in the Republic of South Africa. The completely thorough, painstaking and tactful way Mr. Burke set about this difficult task is something that I and all those associated with him in this venture find it difficult adequately to express in words of thanks and appreciation.

The thanks and appreciation of myself and the Executive Council are warmly extended to those authors who took the time and trouble to prepare and read technical essays for the Convention and to all those members, affiliates and visitors who took part in the discussions; to my Secretary, Mrs. Beulah Britton for coping with a mountain of correspondence over so many months; to the Town Clerk's Department and to the Acting Town Clerk, Mr. Les Bloomfield, for seconding to us for the week of the Convention, his senior lady staff in Mrs. Molly Truscott and Mrs. Cath Irvine; to the very able Mr. P. J. Conradie, our Association's official translator; to Mr. W. J. Botha and his assistant for most efficient and reliable sound recording; to Miss Elaine Brewin for her usual efficient secretarial work, both during the Convention and at our Executive Council Meetings; to Mrs. Joyce

Mr. C. Lombard (Germiston) conveyed to the President the appreciation of all for the outstanding manner in which he had conducted the Convention and for his guidance.

This was followed by the singing of "For he's a jolly good fellow".

Bradfield, also of our Association's secretarial staff in East London, for ensuring that we all had a bed to sleep in and Mrs. Elizabeth Hill of Musgrove and Watson for the efficient organisation of the Charter Flight and luxury coach services; Mobil Oil Co. for presenting us with those beautiful colour brochures and the B.A.T. Cigarette Co. for their assistance in a number of ways. And, lastly but by no means least, our thanks to those lovely ladies who attended in near-record numbers with their husbands to add grace and charm to our proceedings. Not forgetting of course our old friend John Morrison's perfectly timed and spoken eulogy to these delightful ladies and we are pleased to see you looking so well again.

Finally and on a note perhaps a little sombre, it is sad to relate that, with the effluxion of time, a lot of familiar faces we have known over the years will tend to disappear from the AMEU scene. This has become the more evident with Conventions now held biennially. By the time we meet again in full Convention in Cape Town in 1971, Robert Leishman of Johannesburg, a pillar of strength of the Executive Council and in the affairs of the AMEU and of the Highveld Branch in the Transvaal, will have retired from municipal service. So also will have Arthur Frantz of Cape Town and that most colourful and cheerful character, Mr. J. F. Latagan of Stellenbosch, both of whose services to the Executive Council have been so valuable and are today recorded with appreciation. Going into retirement also is Mr. J. G. F. Erickson of Estcourt, Natal; Mr. J. S. Mathews of Kimberley, Cape; Mr. J. J. Inglis of Pietersburg, Transvaal; and Mr. John Jones of Bulawayo. Perhaps there are others of whom I am unaware. To these gentlemen, whom, it goes without saying, we would always be pleased to see with us in the future, I would extend on behalf of the Executive Council of the AMEU our very best wishes for a long and happy life away from the cares of office. You have all served your profession and this Association so very well.

And so it is now only left to me to conclude and close this the 41st AMEU Convention and I wish you all a safe return home. Thank you. Baie dankie en totsiens.

Mnr. C. Lombard (Germiston) dra die dank en waadering van al die aanwesiges aan die President oor vir die uitstekende wyse waarop hy die sake van die Konvensie gehanteer het en vir sy waardevolle leiding. Hierop sing die aanwesiges die President toe „Want hy is 'n gawe kêrel”.



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