Office Copy

# PROCEEDINGS

of the

## Nineteenth Convention

of the

# Association of Municipal Electricity Undertakings

of South Africa and Rhodesia

(*Founded* 1915)

HELD AT

## Salisbury and Bulawayo

From Tuesday, May 15th, to

Thursday, May 22nd

## 1945

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PRICE FIFTEEN SHILLINGS

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**PROCEEDINGS.**



**Reports.**

ASSOCIATION OF

# Municipal Electricity Undertakings

OF SOUTH AFRICA AND RHODESIA

Founded 1915

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## EXECUTIVE COUNCIL, 1945

**President Salisbury Conference:**
J. S. CLINTON (Salisbury)

**President:**
W. J. PHILLIPS (Bulawayo)

**Vice-President:**
W. N. POWELL (Bloemfontein)

**Past Presidents:**
I. J. NICHOLAS (Umtata)
H. A. EASTMAN (Cape Town)

**Councillor Members:**
J. OHLSEN (Bulawayo)
J. W. du PLESSIS (Bloemfontein)
C. OLLEY (Salisbury) (Alternate)
E. BOYLAN (Johannesburg) (Alternate)

**Other Members:**
D. J. HUGO (Pretoria)
C. KINSMAN (Durban)
J. C. FRASER (Johannesburg)
G. R. E. WRIGHT (Benoni)

**Secretary and Treasurer:**
L. L. HORRELL (until 30th November 1945)
A. T. TAYLOR (from 1st December 1945)
P.O. Box 7462, Johannesburg

## REPRESENTATIVES:

**World Power Conference (Local Committee):** H. A. EASTMAN, Cape Town.
**S.A. Standards Institution:** G. R. E. WRIGHT, Benoni; D. J. HUGO, Pretoria.
**Safety Precautions Committee:** J. C. FRASER, Johannesburg; G. R. E. WRIGHT, Benoni.
**Electrical Wiremen's Registration Board:** A. RODWELL, Johannesburg, (until 31st December, 1945.) J. C. Fraser, Johannesburg, (from 1st. January 1946.)

## PAST OFFICERS AND MEMBERS OF COUNCIL:

| Past Presidents: | | | Sec. and Treas.: |
|---|---|---|---|
| 1915-17 | J. H. DOBSON | Johannesburg | F. T. Stokes: E. T. Price |
| 1917-19 | J. ROBERTS | Durban | E. Poole |
| 1919-20 | B. SANKEY | Port Elizbeth | E. Poole |
| 1920-22 | T. C. W. DOD | Pretoria | L. L. Horrell |
| 1922-24 | G. H. SWINGLER | Cape Town | H. A. Eastman |
| 1924-26 | J. ROBERTS | Durban | E. Poole |
| 1926-27 | B. SANKEY | Johannesburg | R. G. Tresise |
| 1927-29 | J. M. LAMBE | East London | P. Adkins |
| 1929-31 | R. MACAULAY | Bloemfontein | E. Poole |
| 1931-32 | L. L. HORRELL | Pretoria | E. Poole |
| 1932-34 | L. F. BICKELL | Port Elizabeth | F. A. P. Perrow |
| 1934-35 | A. R. METELERKAMP | Bulawayo | E. Poole |
| 1935-36 | G. G. EWER | Pietermaritzburg | E. Poole |
| 1936-37 | A. RODWELL | Johannesburg | E. Poole |
| 1937-38 | J. H. GYLES | Durban | E. Poole |
| 1938-39 | H. A. EASTMAN | Cape Town | E. Poole |
| 1939-44 | I. J. NICHOLAS | Umtata | E. Poole until Dec. '40. L. L. Horrell, Jan. '41 |
| 1944-45 | A. RODWELL | Johannesburg | L. L. Horrell |

### Past Ordinary Members of Council:

1915-17 J. Roberts; W. Bellad Ellis; B. Sankey.
1917-19 W. Bellad Ellis; G. Stewart, T. C. W. Dod; T. Jagger.
1919-20 W. Bellad Ellis; G. Stewart; E. T. Price; A. S. Munro.
1920-22 L. F. Bickell; T. Millar; L. B. Proctor; E. Poole.
1921-24 L. F. Bickell; T. Millar; R. W. Fletcher; J. Roberts.
1924-26 T. Jagger; A. S. Munro; T. Millar; L. F. Bickell.
1926-27 L. F. Bickell; T. C. W. Dod; T. Millar; E. Poole.
1927-29 L. F. Bickell; R. A. Young; T. Millar; E. Poole.
1929-30 L. F. Bickell; T. Millar; F. C. D. Mann; G. H. Swingler; A. Rodwell.
1931-32 T. Millar; F. C. D. Mann; G. H. Swingler; A. Rodwell.
1932-34 T. Millar; J. H. Gyles; G. H. Swingler; A. Rodwell.
1934-35 T. Millar; J. H. Gyles; G. H. Swingler; A. Rodwell.

| Councillors: | Alternate Councillors: | Engineers: |
|---|---|---|
| | 1935-36: | G. H. Swingler (C.T.) |
| T. P. Gray (J'burg) | H. W. Dely (Pretoria) | J. H. Gyles (Dbn) |
| J. McLean (P.E.) | | T. Millar (H'smith) |
| | | E. H. Behrens (P.E.) |
| | 1936-37: | G. H. Swingler (C.T.) |
| H. Middlebrook (Dbn) | F. Morrell (C.T.) | T. Jagger (C.T.) |
| T. P. Gray (J'burg) | J. McLean (P.E.) | E. A. Behrens (P.E.) |
| | | G. M. Pirie (Blftn) |
| | 1937-38: | L. L. Horrell (Pretoria) |
| H. G. Capell (Dbn) | H. Middlebrook (Dbn) | J. S. Clinton (S'bury) |
| W. James (C.T.) | L. Hofmeyr (S'bosch) | A. Q. Harvey (Springs) |
| | | G. M. Pirie (Blftn) |
| | 1938-39: | D. J. Hugo (Pretoria) |
| E. Spilkin (Umtata) | G. C. Starkey (E.L.) | J. S. Clinton (S'bury) |
| W. James (C.T.) | W. Fowkes (C.T.) | A. Q. Harvey (Springs) |
| | | G. M. Pirie (Blftn) |
| | 1939-44: | D. J. Hugo (Pretoria) |
| E. Spilkin (Umtata) | G. C. Starkey (E.L.) | C. Kinsman (Dbn) |
| C. Olley (S'bury) | W. Fowkes (C.T.) | A. Q. Harvey (Springs) |
| | | G. M. Pirie (Blftn) |
| | | W. M. Powell (Blftn) |
| | 1944-45: | D. J. Hugo (Pretoria) |
| H. H. Verity (J'burg) | H. E. Gearing (C.T.) | C. Kinsman (Dbn) |
| C. Olley (S'bury) | R. N. Thomas (Dbn) | J. C. Fraser (J'burg) |
| | | G. R. E. Wright (Benoni) |

# ASSOCIATION OF
# Municipal Electricity Undertakings
## OF SOUTH AFRICA AND RHODESIA.

**1. TITLE.**

The name of the Association shall be "The Association of Municipal Electricity Undertakings of South Africa and Rhodesia."

**2. OBJECTS.**

The objects for which the Association is formed are:-

(a) To promote the interests of Municipal Electricity Undertakings.
(b) To bring Municipal Electrical Engineers and Chairmen and Members of Municipal Electricity Committees together.
(c) To arrange and hold periodical meetings for the reading of papers and discussions of subjects appertaining to Municipal Electricity Undertakings.
(d) To take such action as may be lawful and expedient for the protection and defence of the rights or interests of Municipal Electricity Undertakings.

**3. MEMBERSHIP.**

The Association shall consist of:

(a) Honorary Members.
(b) Councillor Members.
(c) Engineer Members.
(d) Associate Members.
(e) Associates.

All Hon. Members and Members of the Association of Municipal Electrical Engineers shall ipso facto become Hon. Members and Engineer Members of the Association of Municipal Electricity Undertakings and existing Associate Members shall be eligible to transfer to the class of Associate.

**4. QUALIFICATIONS.**

The qualifications for admission to the Association shall be as follows:

(a) **Honorary Members** shall be distinguished persons who are or who have been intimately connected with Municipal Electricity Undertakings and whom the Association especially desires to honour for exceptionally important services in connection therewith.
(b) **Councillor Members.** The Member whose Chief Electrical Engineer shall have qualifications acceptable to the Council shall be the Committee appointed by the Municipality or Local Authority to have control over its Electricity Undertakings and shall be represented as regards its qualifications to vote by one member of such Committee.

(c) **Engineer Members.** The Member shall be the Chief Electrical Engineer engaged on the permanent staff of an Electricity Undertaking owned by a Municipality or Local Authority and who has had a thorough training in electrical engineering and is otherwise aceptable by the Council of the Association. Any duly qualified assistants in an undertaking with sales of over 20,000,000 units per annum may also be admitted to this class on the recommendation of the Chief Electrical Engineer.

(d) **Associate Members.** The Member shall be a Technical Assistant engaged on the permanent staff of any Electricity Undertaking represented by its Councillor Member and/or Engineer Member.

(e) **Associates.** Any Member resigning from the class of Engineer Member or Associate Member shall be entitled to apply for transfer to the class of Associate.

An Associate may also be an Engineer in the employ of the Victoria Falls and Transvaal Power Company or the Electricity Supply Commission, who may be engaged in the public supply of electricity to municipalities.

**5. ADMISSION OF MEMBERS.**

(a) The election of Honorary Members and other classes shall be vested in the Council.

(b) Councillor Members may be admitted on an application signed by the Town Clerk of the Municipality or Local Authority concerned.

(c) Every candidate for election into the Association as Engineer Member shall make application on the prescribed form suitably endorsed by two supporters who shall be either Engineer Members, Councillor Members or Members of the Committee of the Municipal or Local Authority in charge of the Electricity Undertaking of which the applicant is Chief Electrical Engineer.

(d) Every candidate for election into the Association as Associate Member or Associate shall make application on the prescribed form suitably endorsed by the Engineer Member on whose staff he is engaged.

(e) Every candidate for transfer to the class of Associate shall make application in writing for transfer.

**6. CONTRIBUTIONS.**

Contributions shall become due and payable annually on the 1st day of September which shall constitute the new financial year of the Association.

(a) **Honorary Members** shall not be required to pay any contribution.

(b) **Councillor Members.** In the case of the Committee appointed by a Municipality or Local Authority to have control over the Electricity Undertaking, the undermentioned scale of contributions shall apply:

| | | |
|---|---|---|
| up to | ½ million | 4 guineas. |
| up to | 1 million | 6 ,, |
| up to | 10 million | 8 ,, |
| all over | 10 million | 10 ,, |

(c) **Engineer Members.** The contribution of an Engineer Member in the service of a Committee making a contribution shall merge into and form part of such contribution. When a Committee is not a Member or resigns from membership, the Engineer Membership contribution shall be two (2) guineas.

(d) **Associate Members and Associates.** The contribution of Associate Members or Associates shall be one (1) guinea.

**Part Year Contribution.** All Members shall pay the contribution for the year in which they are elected without reference to the period of the year at which their election takes place and they shall be entitled to receive a copy of the Proceedings or any other publication issued during such year.

**Arrear Contributions.** No class of member whose contribution is six months in arrear shall be entitled to attend or take part in any of the meetings of the Association or to receive any of the Association's publications.

Any class of member whose contribution is in arrear at any Convention shall deem to have forfeited claim to membership and his name may, by the Council, be removed from the register of the Association, but he shall nevertheless be liable for such arrears up to the date of his name being removed.

**7. COUNCIL.**

**Management.** The affairs of the Association shall be managed by the Council, who shall have power to incur any expenditure necessary for the objects of the Association.

**Members of the Council.** The Council shall consist of a President, Vice-President, two Immediate Past Presidents, all of whom shall be Engineer Members, and six other Members, two of whom may be Councillor Members.

**Officers of Council.** The officers of the Council shall be the President, Vice-President and Secretary & Treasurer.

**Election of Council.** Officers and Members of the Council (other than the Secretary & Treasurer) shall be elected by nomination and ballot at the Convention, and shall hold office until the next Convention. In the event of a vacancy occurring during the year the remaining Members shall have power to appoint a Member to fill the vacancy.

**Co-option.** The Council shall have power to co-opt any members of the Association or other person for any special purpose whose services in their opinion may advance the objects of the Association.

**Election of Secretary & Treasurer:** The Council shall appoint and from time to time determine the remuneration (if any) and prescribe

the duties of the Secretary & Treasurer who shall hold office during the pleasure of the Council.

8. **MEETINGS.**

**Council.** The Council shall meet as often as the business of the Association may require and at any meeting three shall constitute a quorum.

**Convention.** The Association shall hold Conventions yearly (of which the local Press of the town in which the Convention is held shall be given full particulars) as far as may be conveniently arranged, and at that meeting the Secretary & Treasurer shall present the Report and Balance Sheet of the Association for the immediate past period.

**Quorum.** At any meeting of the Association 15 shall form a quorum.

**Chairman.** The President shall take the chair at all meetings of the Association, the Council and the Committees, at which he is present, and shall regulate and keep order in the proceedings.

In the absence of the President, it shall be the duty of the Vice-President to preside at the meetings of the Association, and to regulate and keep order in the proceedings. But in the case of the absence of the President, and of the Vice-President, the meeting may elect any member of the Council or, in the case of their absence, any member present to take the chair at the meeting.

**Resolve into Committee.** The Association shall reserve to itself the right to resolve itself into Committee at any time during its proceedings; moreover, it shall be competent for any member to have his paper read and discussed in committee if he so desires.

**Sectional Voting.** When a motion is before any Convention or meeting of the Association it shall be competent for any member of either the Councillor or Engineer sections to apply to the Chairman for a "Vote by Section." This application shall be granted by the Chairman, whereupon each of these sections shall vote separately on the motion and unless a majority shall be obtained in each section the motion shall be lost. On a sectional vote being called for, Associate Members and Associates shall not be entitled to vote.

# MEMBERS, DELEGATES AND VISITORS ATTENDING CONVENTION

Honorary Member: L. L. Horrell

## ENGINEERS AND COUNCILLORS:

**Bloemfontein:**
W. N. Powell.
**Bulawayo:**
J. W. Phillips.
A. R. Sibson.
Cr. J. Ohlsen.
Cr. F. J. Shacklock.
**Benoni:**
G. R. E. Wright.
Cr. A. A. Webb.
**Cradock:**
A. Rossler.
**Cape Town:**
H. A. Eastman
Cr. G. E. Ferry.
**Durban:**
Cr. O. E. Pritchard.
**Fort Victoria:**
G. G. Heasman
**George:**
P. H. Newcombe.
Cr. S. Miller.
**Gatooma:**
F. E. Syers.
**Johannesburg:**
J. C. Fraser.
Cr. C. F. Beckett, M.P.C.
Cr. E. Boylan, M.P.C.
**Kimberley:**
C. R. Burton.
Cr. G. S. Eden.
Cr. M. Sullivan.
**Klerksdorp:**
W. Theron.
**Kroonstad:**
W. Rossler.
Cr. A. N. Symons.
**Ladysmith:**
F. Stevens.
Cr. H. Quick.
**Mafeking:**
G. E. H. Jones.
Cr. Major C. L. Cooke, D.C.M.
**Nigel:**
H. Bickley.
Cr. D. E. Ellis.
Cr. T. Boyde.

**Port Elizabeth:**
D. A. Bradley.
**Potgietersrust:**
W. Rush.
**Pretoria:**
Jno. Wilson.
Cr. G. H. Brink.
Cr. C. W. Sinclair.
Cr. D. P. van Heerdon.
**Que Que:**
G. E. Dawson.
**Robertson:**
P. L. Vergottini.
**Roodepoort:**
H. L. Groom.
Cr. W. F. Liebenberg.
**Rustenburg:**
P. A. Meintjies.
**Somerset East:**
H. A. Prevost.
Cr. F. S. C. Meaker.
**Standerton:**
C. E. Gregor.
**Springs:**
J. C. Downey.
Cr. T. C. Davies.
Cr. A. V. Dyer.
**Salisbury:**
J. S. Clinton.
B. H. J. Tubb.
Cr. C. H. Gibb.
H.W. the Mayor, Cr. C. Olley.
**Stellenbosch:**
D. W. Ritson.
Cr. Dr. P. J. S. de Wet.
**Uitenhage:**
A. Elliott.
**Umtali:**
H. T. Turner.
Cr. W. R. Love.
**Worcester:**
H. J. Gripper.
Cr. E. Traub.

## OTHER MEMBERS:

| | |
|---|---|
| R. D. Coulthard | Salisbury |
| C. H. V. Baskerville | Salisbury |
| R. Leishman | Johannesburg |
| B. Marchand | Witbank |

## DELEGATES:

**Electricity Supply Commission**
H. H. Jagger, Cape Town

**Rhodesian Government Railways**
F. Rettie

**Posts and Telegraphs**
A. Southwick
A. T. Harpham

**Union Government S.A. Railways and Harbours**
G. D. Dalton

**Victoria Falls and Transvaal Power Co., Ltd.**
J. S. Trelease

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## VISITORS:

| | | |
|---|---|---|
| E. L. Jephcott | Salisbury | Dept. of Posts and Telegraphs |
| K. G. Stevens | Salisbury | Johnson and Fletcher |
| Morton Rothway, Clr. | Salisbury | Secy. Rhodesian Society of Engineers |
| J. H. McGowan | Salisbury | E.S.D. of Rhodesia |
| J. Reid Rowland | Salisbury | Commissioner E.S.C. Rhodesia |
| A. S. Bright | Johannesburg | Visitor, Westinghouse |
| W. H. Mumford | Salisbury | Councillor |
| F. G. Collins | Salisbury | Visitor |
| B. Lightfoot | Salisbury | Director Geological Society |
| F. Elliott | Salisbury | Chief Mining Engineer |
| J. W. Rogan | Salisbury | Visitor |
| S. A. Rowe | Salisbury | Sec. for Commerce and Industries |
| A. Haddow | Salisbury | Councillor |
| J. W. E. Stone | Salisbury | Visitor |
| R. E. Reid | Salisbury | Visitor |
| A. W. H. Tedder | Salisbury | Ch. Govt. Mech. Engineer |
| Major Redman | Johannesburg | Visitor |
| G. L. Drewett | Johannesburg | Visitor |
| E. Val Davies | Johannesburg | Visitor |
| W. Mackenzie | Johannesburg | Visitor |

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## ELECTRICAL TRADES:

**African Cables, Ltd.:**
A. G. Royston.

**British General Electric Co., Ltd.:**
S. G. Mortimer.
F. A. P. Perrow.

**British Insulated Cables:**
A. L. Sanders.

**Chloride Electric Storage Coy.:**
A. G. Tilley.

**Enfield Cables (S.A.) (Pty.) Ltd.:**
A. E. Torrance.

**English Electrical Co., Ltd.:**
W. G. H. Jarvis.

**Hubert Davies & Co., Ltd.:**
J. Russel.

**Metropolitan Vickers:**
C. R. Deglow.

**Reyrolle & Co.:**
C. E. R. Langford.
G. R. Pilcheys.

**S.A. Cable Makers' Association:**
E. R. Smith.

**Westinghouse:**
V. A. Bright.

**Wilson & Herd:**
C. B. Wilson.

LADIES:

Mrs. T. Bryde, Nigel.
Mrs. Breen, Springs.
Mrs. D. A. Bradley, Port Elizabeth.
Mrs. G. H. Brink, Pretoria.
Mrs. J. S. Clinton, Salisbury.
Mrs. T. C. Davies, Springs.
Mrs. H. A. Eastman, Cape Town.
Mrs. G. S. Eden, Kimberley.
Mrs. A. Elliott, Uitenhage.
Miss Harris, Durban.
Mrs. D. van Heerdon, Pretoria.
Mrs. W. R. Love, Umtali.
Mrs. W. J. Phillips, Bulawayo.
Mrs. W. N. Powell, Bloemfontein.
Mrs. E. O. Pritchard, Durban.
Mrs. C. Sinclair, Pretoria.
Mrs. E R. Smith, Johannesburg.
Mrs. H. A. Prevost, Somerset East.
Mrs. G. R. Wright, Benoni.
Mrs. D. W. Ritson, Stellenbosch.
Mrs. R. Leishman, Johannesburg.
Mrs. W. J. Gibbons, Johannesburg.
Mrs. H. H. Jagger, Johannesburg.
Mrs. J. S. Trelease, Johannesburg.
Mrs. A. E. Val Davies, Johannesburg.
Mrs. A. R. Sibson, Bulawayo.

## LIST OF MEMBERS 1944/45

### HONORARY MEMBERS:

J. H. VAN DER BIJL, Dr., Electricity Supply Commission.
L. L. HORRELL, Johannesburg.
E. POOLE, Durban.
A. T. RODWELL, Johannesburg.
G. H. SWINGLER, Cape Town.

### COUNCILLOR MEMBERS:

Adelaide
Alice
Beaufort West
Benoni
Bethlehem
Blantyre
Bloemfontein
Boksburg
Brandfort
Bulawayo
Burgersdorp
Cape Town
Cradock
Durban
East London
Ermelo
Eshowe
Fort Beaufort
Fort Victoria
George
Graaff-Reinet
Grahamstown
Gwelo
Hercules
Johannesburg
Kimberley
Klerksdorp
Knysna
Kokstad
Kroonstad
Krugersdorp
Kuruman
Ladybrand
Ladysmith
Louis Trichardt
Mafeking
Matatiele
Middelburg, C.P.
Middelburg, Tvl.
Nelspruit
Nigel
N'dola
Oudtshoorn
Paarl
Pietersburg
Pietermaritzburg
Piet Retief
Port Alfred
Port Elizabeth
Port Shepstone
Potgietersrust
Pretoria
Queenstown
Randfontein
Robertson
Roodepoort-Maraisburg
Salisbury
Somerset East
Springs
Springfontein
Stanger
Stellenbosch
Uitenhage
Umtata
Umtali
Upington
Vereeniging
Victoria West
Vryburg
Walmer
Winburg
Windhoek
Worcester

### ENGINEER MEMBERS:

ADAMS, D. H., Oudtshoorn.
ASHLEY, T. P., Queenstown.
ANDERSON, F., Port Alfred.
BASKERVILLE, J. J., Port Elizabeth.
BEVINGTON, H. R., Middelburg, C.P.
BICKLEY, H., Nigel.
BRADLEY, D. A., Port Elizabeth.
BURTON, C. R., Kimberley.
CALDER, D. G., Matatiele.
CLINTON J. S. Salisbury, S.R. (Vice President)
COPPIN, T. J., Walmer, C.P.

DWYER, C. H., Stanger, Natal.
DENE, G., Eshowe.
DE WET, D. P., Springfontein.
EASTMAN, H. A., Cape Town
(Past President)
ELLIOTT, A., Uitenhage, C.P.
FISHER, K. M., Bethlehem.
FODEN, A., East London.
FOLEY, C. B., Vereeniging.
FORD, A. M., Winburg, O.F.S.
FRASER, J. C., Johannesburg
(Member of Council)
GERICKE, J. M., Nelspruit.
GRANDIN, P. C., Vryburg, C.P.
GREGOR, C. E., Standerton, Tvl.
GRIPPER, H. J., Worcester.
GROOM, H. L., Roodepoort.
HARVEY, A. Q., Springs.
HALLE, C. R., Pietermaritzburg.
HEASMAN, G. G., Fort Victoria, S.R.
HOURELD, W., Randfontein.
HUGO, D. J., Pretoria
(Member of Council)
INGLIS, J. I., Ermelo, Tvl.
IVERACH, J., Grahamstown, C.P.
JONES, G. E. H., Mafeking, C.P.
KINSMAN, C., Durban
(Member of Council)
KRUGER, J. J., Adelaide, C.P.
LATEGAN, J. F., Brandfort.
LEISHMAN, R., Johannesburg.
LOTTER, G. D., Ladybrand.
LYALL, R. R., Louis Trichardt.
MAIL, W. MORTIMER, Kokstad.
MOCKE, T. M., Piet Retief, Tvl.
MEINTJIES, P. P., Rustenburg.
MULLER, G. J., Bloemfontein.
MULLER, H. M. S., Upington, C.P.
NEWCOMBE, P. H., George, C.P.
NICHOLAS, I. J., Umtata, Transkei
(Past President)
NOAKES, C. F. L., Newcastle, Natal.
PHILLIPS, J. W., Bulawayo, S.R.
POWELL, W. N., Bloemfontein.
PREVOST, H. A., Somerset East.
RELINAN, H. J., Paarl, C.P.
RITSON, D. W., Stellenbosch, C.P.
ROGERS, J., Fort Beaufort, C.P.
ROSS, W. D., Potchefstroom.
ROSSLER, A., Cradock, C.P.
ROSSLER, W., Kroonstad.
RUSH, W., Potgietersrust.
SIBSON, A. R., Bulawayo, S.R.
SMITH, E. L., Burgersdorp, C.P.
SPARKS, L. B. Pietersburg.
STEVENS, F., Ladysmith, Natal.
THOMAS, K. W., Kuruman.
THERON, W., Klerksdorp.
TUBB, B. H. J., Salisbury.
TURNER, A. T., Umtali, S.R.
VERGOTTINI, P. L., Robertson.
VERRYN, A. J., Middelburg, Tvl.
VELDMAN, S. T., Vryburg.
WHITE, J. H., N'dola, N. Rhodesia.
WILLIAMS, V. E., Windhoek.
WILSON, J., Pretoria.
WRIGHT, G. R. E., Benoni
(Member of Council)

## ASSOCIATE MEMBERS:

SELLER, W. J., P.O. Box 15, Boksburg.
McDONALD, F. G., c/o City Electrical Engineer, Salisbury, S.R.

## ASSOCIATES:

BEHRENS E. A., 229, Vance Road, Durban.
BASKERVILLE, C. H. V., P.O. Box 1094, Salisbury, S.R.
CASTLE, F., P.O. Box 303, Cape Town.
CAMPBELL, A. R., P.O. Box 584, Johannesburg.
CLINTON, J. S., 34, Wanderers Street, Johannesburg.
COULTHARD, R. D., Salisbury.
DAWSON, C., Electric Supply Commission, Congella, Durban.
DELPORT, G. C., P.O. Box 6, Delmas.
DOBSON, J. H., Dr., P.O. Box 7764, Johannesburg.
EWER, G. G., 9th Floor, Surrey House, Rissik Street, Johannesburg.
GILES, P. A., East London.
GYLES, J. H., Gillets, Natal.
MARCHAND, B., P.O. Box 223, Witbank.
MERCIER, G., Electric Supply Commission, Salisbury.
MILTON, W. H., P.O. Box 1091, Johannesburg.
PENTZ, J. O., P.O. Box 4560, Johannesburg.
POWELL, W. N., Box 1386, Johannesburg.
PROCTOR, L. B., 98 Ernest Road, Kensington.
SMITH, M. M., Paarl Road, Malmesbury.
STEWART, G. A., P.O. Box 6672, Johannesburg.
STEWART, M. D.
SYERS, F. E., P.O. Box 55, Gatooma, S. Rhodesia.
WEST, J. A., P.O. Box 24, St. Michaels, South Coast, Natal,

## PROGRAMME

**Monday, 14th May, 1945**

**Bulawayo**

| | |
|---|---|
| 7.15 a.m. | Johannesburg train arrives. |
| 8.20 a.m. | Cape train arrives. |
| | Delegates met and transported to Palace Hotel for breakfast. |
| 12 noon | Lunch. |
| 1.00 p.m. | Drive to Matopos and afternoon tea as guests of City Council. |
| 1.30 p.m. | Taken to station en route to Salisbury by first train. |
| 6.00 p.m. | Taken to station en route to Salisbury by second train. |

**Salisbury**

| | |
|---|---|
| 10.00 a.m. | Executive Council Meeting. |

**Tuesday, 15th May, 1945**

| | |
|---|---|
| 5.50 a.m. | First train from Bulawayo arrives. |
| 7.35 a.m. | Second train from Bulawayo arrives. |
| 9.00 a.m. | Registration. Issue of Agenda and Notices at the Rhodesia State Lottery Hall, Kingsway. |
| 10.00 a.m. | Official opening of Conference by His Worship the Mayor of Salisbury (Clr. C. Olley). |
| 10.30 a.m. | Annual General Meeting (Municipal delegates and visitors may attend but only members are entitled to vote). |

## AGENDA

1. Annual Report of Secretary and Treasurer.
2. Election of President.
3. Election of Officers.
4. Venue and provisional date of next Convention.
5. Presidential Address.
6. General.

## RETIRING OFFICERS

The following are the retiring officers:—

| | |
|---|---|
| **President:** | J. S. Clinton, Salisbury. |
| **Past Presidents:** | A. T. Rodwell, Johannesburg. |
| | I. J. Nicholas, Umtata. |
| | H. A. Eastman, Cape Town. |
| **Council Members:** | H. H. Verity, Johannesburg. |
| | C. Olley, Salisbury. |
| | H. E. Gearing, Cape Town. |
| (Alternate) | R. N. Thomas, Durban. |
| **Engineer Members:** | D. J. Hugo Pretoria. |
| | C. Kinsman, Durban. |
| | J. C. Fraser, Johannesburg. |
| | G. R. E. Wright, Benoni. |

1.00 p.m. Civic Luncheon, Grand Hotel.

**REPORTS:**

2.45/5.30 p.m.

1. S.A. Standards Institute—Mr. J. C. Fraser.
2. World Power Conference—Mr. A. T. Rodwell.
3. Safety Precautions Committee—Messrs. Fraser and Wright.
4. Electrical Wiremen's Registration Board—Mr. A. T. Rodwell.
5. Factories Act—Report by Secretary.
6. Earthing, Concrete Asbestos Piping—Report of Sub-Committee.
7. Electricity and Standards, Electricity Overhead Mains—Mr. J. C. Fraser.
8. Electricity Conductors Advisory Committee Mr. R. Leishman.
9. Electricity Generating and Distribution Advisory Committee—Messrs. Eastman and Hugo.
10. Public Utilities Advisory Committee—Report by Secretary.
11. Salaries Scales and Pensions Committee—Mr. W. N. Powell.
12. A.M.E.U. Standards Sub-Committee—Reports of Chairman, Regional Committees.
13. Registration of Electrical Wiring Contractors—Mr. J. C. Fraser.
14. Joint National Power Board—Report by Secretary.

6.00 p.m. Sundowners at private homes.

**Wednesday, 16th May, 1945**

8.30 a.m. Executive Council Meeting.

9.00 a.m. Convention meets.

1. Report of Executive Council.
2. Reports left over (if any) from previous day.
3. General.
4. Paper—"The development of the Salisbury Electricity Undertaking" by J. S. Clinton, City Electrical Engineer, Salisbury.
   Discussion.

11.00 a.m. Photographing of Delegates at Town House.

2.00 p.m. Visits to places of technical interest, Power Station

5.30 p.m. Concrete Plant, Distribution System, E.S.C. Workshops and Rural Areas.

6.00 p.m. Civic Sundowner at the Public Gardens.

**Thursday, 17th May, 1945**

8.30 a.m. Executive Council Meeting.

9.00 a.m. Convention meets.

1. Report of Executive Council.
2. Paper—"Aspects on the relationship of the Municipal Engineer and the Post Office Engineer, and its effect on progress" by Mr. A. Southwick, Chief Engineer, Dept. of Posts and Telegraphs, S. Rhodesia.
3. Discussion.

2.00 p.m. Drive to Mazoe: inspection of rural distribution, small mining propositions and citrus estate.
Drive to Mermaids Pool; inspection of rural distribution en route.

8.15 p.m. Cinema Show at Palace Theatre as guests of City Council

**Friday, 18th May, 1945**

8.30 a.m. Executive Council Meeting.
9.00 a.m. Convention meets.

1. Report of Executive Council.
2. Reports left over (if any) from Wednesday, 16th May.
3. Discussion.

2.00 p.m. Visits to places of technical interest, Power Station
5.30 p.m. Concrete Plant, R.A.T.G. Air Station, Distribution System, E.S.C. Workshops and Rural Areas.
7.30 p.m. Supper Dance as guests of City Council at the Drill Hall, by permission of O.C., 1st Battalion Rhodesia Regiment.

**Saturday, 19th, May 1945**

8.30 a.m. Executive Council Meeting.
9.00 a.m. Convention Business.
12.30 p.m.
2.00 p.m. Drive to Mermaid's Pool; inspection of rural distribution en route.
Races.

**Sunday, 20th, May 1945**

10.00 a.m. Drive to Prince Edward Dam and morning tea.
Afternoon free.
6.15 p.m. Leave Salisbury for Bulawayo.
6.45 p.m. Leave Salisbury for Bulawayo.

**Monday, 21st May, 1945**

7.00 a.m. First train arrives at Bulawayo.
10.00 a.m. Executive Council Meeting.
11.40 a.m. Second train arrives at Bulawayo.
2.15 p.m. Convention re-assembles in small City Hall and welcomed by H.W. the Mayor of Bulawayo (Clr. D. MacIntyre).
2.30 p.m. Convention business.
2.45 p.m. Paper—"The development of the Bulawayo Electricity
5.30 p.m. Undertaking" by Mr. A. R. Sibson, Asst. City Electrical Engineer.
Discussion.

7.00 p.m. Civic dinner at the Crystal Court, Grand Hotel.

**Tuesday, 22nd May, 1945**

9.00 a.m. Executive Meeting.

10.00 a.m. Visit to Power Station and morning tea.

2.30 p.m. Outstanding Convention business and farewell speeches, Convention closes.

8.15 p.m. Popular Concert by the Bulawayo Municipal Orchestra at the City Hall, as guests of the City Council.

**Wednesday, 23rd May, 1945**

Leave for Union.

# Proceedings of the NINETEENTH CONFERENCE

## TUESDAY, 15th MAY, 1945

THE NINETEENTH CONVENTION of the Association of Municipal Electricity Undertakings (Union of South Africa and Rhodesia) was opened in the Rhodesian State Lottery Hall at 10 a.m. on Tuesday, the 15th May, 1945.

**The Vice-President,** Mr. J. S. Clinton (Salisbury), in the chair: Mr. Mayor,— It is my privilege to-day to welcome you to this Convention and to ask you to open the proceedings.

Citizens of Salisbury,—I do not need to introduce to you your Mayor. Members of the Association,—You all know our Mayor, Councillor C. Olley, who is a Member of your Executive. We all know his reputation for starting things, and to-day we are asking him to start something which will, I hope, prove to be a milestone in the progress of this Association. During his term of office on the Executive, Councillor Olley has served us very well. He has certainly kept us from being complacent. As you know, technical experts are always right, but Councillor Olley makes us prove that we are right, which in a way is not a bad thing. It is a form of intellectual exercise and I think it has done us an enormous amount of good. To-day I feel will be no exception. We are expecting great things from our Mayor, and I will now call upon him to open this, our Nineteenth Convention. (Hear, hear.)

# Official Welcome

**His Worship the Mayor of Salisbury (Councillor C. Olley):** Mr. Chairman, Members of the Executive, Ladies and Gentlemen,—On numerous occasions I have attended conferences of the various departments of municipalities and must confess I have always found them very interesting and enjoyable. Whenever Rhodesians have been in the Union the people down there have always given them a very good time, and frequently we have commented upon the fact that we have always been treated with what you may call the very highest good neighbourly relationship. It is my turn and my privilege to welcome you to this city—the capital of Southern Rhodesia, and please understand it is the capital: not the commercial capital. (Laughter.) I hardly think it is necessary for me to assure you that you are very welcome. This is a fact which, as the days pass by, you will realise more and more if you are still capable of it. I think I may say this town is noted for welcoming and entertaining people generally. In fact, I am beginning to wonder, judging by the programme before you, whether you will be doing any work at all.

Now, we feel honoured that you have agreed to hold your Conference in the capital of Rhodesia, or in Rhodesia at all. We feel

that it is a very fine thing to have as many South African Conferences as possible in Southern Rhodesia. Because it helps to promote good neighbourly relations. After all, the only thing that divides us is the Limpopo River and a few Customs restrictions, and in this regard I feel that the time has arrived when we must have much more co-operation than we have had in the past.

As I say, in this city we often have conferences. We have them every month—and sometimes two or three times a month. They are almost invariably called together to carry resolutions demanding that the Government shall do something about something. In fact, as Col. Frank Johnson, the Leader of the Pioneer Column, once said: "This is a wonderful country for carrying resolutions," and I think he might have added: "The people carry the resolutions whilst the Government does what it likes." (Laughter.) In this case, however, I think that the demands you will be making will be more forceful and more directed towards those bodies in the Union who are concerned, including the Government of the Union, and perhaps our Minister who deals with electricity, in a sense, will be glad to feel that he will not be chivied so much as in the past. I have always been a strong supporter of conferences, not so much because I enjoy myself—I do that in any case—but I am a firm believer in the idea that conferences such as this have a tendency to promote knowledge generally. I am satisfied that the time has arrived when Town Councillors must have more "savvy" and realise that a conference such as this, or in connection with any other department of municipal activity, is really and truly part of Council work. We have Councillors—you have them all over South Africa—who occasionally take the view that these meetings are a waste of money, a mere talking business where those assembled can enjoy themselves. It is true we Councillors enjoy ourselves, and we are entitled to do so; but it is a wrong idea that we should discourage them or that we should not send more Councillors to these gatherings to meet other Councillors from different parts of the country and thereby enlarge their outlook. Where Councillors dislike spending money on these affairs, it will usually be found there is a tendency to get into a rut and become out of date. If the municipal staff are to carry out their functions correctly, and if Councillors are to carry on their work in the way the ratepayers expect—that is to say, not making too many blunders—it is imperative that those concerned shall travel round from one centre to another and meet others of their own kind who are doing the same sort of work. They will then get better ideas and that will lessen their chances of making mistakes. But there is more in it than that, and I think this is a matter which needs to be taken up by your organisation. When these conferences make their decisions, the executives of those conferences have naturally to carry them into effect. Now, in the case of your particular Conference, it means that the Members of the Executive are spread around in various parts of South Africa. To hold an Executive meeting entails travelling and incidental expenditure. In my view, their efforts in carrying out the decisions of the Conference

are doing a valuable work, and the Councils should be prepared to pay not only the expenditure necessary from time to time involved in attending these meetings, but should allow this to be done in Council's time. You gentlemen are not doing this for your own benefit: you are doing this work for the betterment of municipal administration generally, and for the provision of modern or improved conveniences or amenities, and by virtue of that, you are undertaking something which is for the good of the people generally, and I am perfectly certain that the people as a whole would be quite willing to bear this expenditure, not only of these conferences, but also of members attending Executive meetings, which includes travelling expenses. (Hear, hear.) The objection comes merely from a few odd members of Councils who take too narrow a view of these matters. I am hoping, therefore, that during the course of your Convention you will raise this question and, moreover, I sincerely hope that Councillors will raise the matter with their own fellow-Councillors, and try to impress upon them that the Convention is really part of the administration of a municipality.

During the course of the next few years, there is not the slightest doubt that in the field of electrical undertakings there will be immense developments. We have witnessed in our own life-time a vast amount of improvement—the introduction of all kinds of what you may call "electrical gadgets," and I am inclined to believe that the next twenty years will see tremendous and outstanding progress in every direction in the electrical field. Personally, I am looking forward to the day when it will be possible to merely press a button and get current for nothing. (Laughter.) You will find the time is not far ahead when householders, industrialists and commercial men generally will be able to reduce their labour requirements by virtue of the fact that much of the work will in future be performed by various electrical appliances. But whilst it may be the means of reducing labour, it may also put up expenditure in repairing and maintaining the various appliances.

Now to turn to another aspect: unfortunately, you have arrived here in between the seasons and you do not see Salisbury at its best. Generally this city is a picture of flowering trees and the gardens are beautiful, but you happen to have arrived at the wrong time. I hope some time you will come here in October or November when we will be able to show you Salisbury as a glorious picture of flowers and jacaranda trees. Now the war is virtually over, possibly the inconvenience of travelling will not be so great, so in the near future we look forward to meeting some of you again, either on some convention or individually. Needless to say, we are very proud of our city, and we must give our former Councillors a great deal of credit for what they have achieved. Without the foundation they created we could not have made this the glorious place it is in the flowering period. Southern Rhodesia is only 54 years of age—this part of it. In that brief period of 54 years we have made very substantial progress, and more particularly so during the last 25

years. Indeed, I think it is correct to say that practically every house in the larger towns of the Colony at any rate, as well as in areas for miles around, enjoys ordinary electrical amenities, and for a country that has been virtually cut out of the wilds, I think that is a very satisfactory state of affairs. (Hear, hear.) It shows that we Rhodesians are of an enterprising type, and that we are eager to follow the example of the big cities elsewhere, and it is that spirit of emulation which has urged us on to try and get this Colony electrified to the utmost extent. It is true that to-day Salisbury is merely lit up and not illuminated, but that is not the fault of our City Electrical Engineer, but of the war.

We also have with us to-day representatives of another important body—the Electricity Supply Commission. This Commission has done a really great work in this country. They have gone out into the wilds—and we have some real wilds, too, with all kinds of wild animals and plenty of crocodiles, though I do not think we have as yet got any "land sharks": but no doubt they will come in time. (Laughter.) Nevertheless, the Commission has taken light and power to a large number of mines and farmers in the remoter parts of the country, and it can be said they are doing a wonderful work in modernising the veld; indeed, I think they are probably making a greater effort in Rhodesia than in any other country in the world, having in mind the wildness of the country and great distances between farm and farm and mine and mine. So rapid is our progress that we hope that in about ten years time every farm, mine and industry right out in the "bundu" will enjoy the latest electrical amenities. (Hear, hear.)

We are also hoping now that the main part of the war is finished, to have a new policy in regard to immigration: we look forward to a larger influx of enterprising people into this country, including, of course, electricians, and we anticipate rapid development in the next 10 or 15 years. My own view is that Southern Rhodesia will about double its population in the next 20 years, and in this regard I should like to say to those newcomers to Rhodesia, and those who look at this country from afar, that we here do not call ourselves any other designation than "Rhodesians."

Now, in conclusion, you are aware, of course, that your esteemed Acting President, Mr. Clinton, is leaving Salisbury shortly to carry on his work elsewhere, and I need not say that the people of Salisbury are very sorry indeed to lose him. We have found him not only a most competent electrical engineer, but very keen and enthusiastic, whose ambition it appears to be to light up the world. (Laughter.) We wish him the very best of luck in his new sphere and even greater success, if possible, than he has achieved so far.

I will not detain you any longer. I can only repeat that we welcome you most heartily, and I wish you every success in your deliberations. May they prove to be of the utmost use and value. I now declare this Nineteenth Convention duly opened. (Applause.)

**The Vice-President:** Mr. Mayor, you have certainly not let Salisbury down. Indeed, during your remarks, I felt that if you would guarantee to be of the same opinion for the next ten years we should be justified in making you a Life Member of the Association. (Hear, hear.) This Convention certainly opens in a very healthy atmosphere and I am sure that the same spirit will prevail throughout. I trust and believe that after this very fine welcome we will succeed in doing a great deal of good work, in which I trust you will also have your due share. (Hear, hear.)

### APOLOGIES.

Ladies and Gentlemen,—I have to say that it is with real regret I have to announce that a number of our very old friends have at the last moment found it impossible to attend this Convention. I may say that the Executive met yesterday morning and authorised me to send a telegram on your behalf to our very dear friend, Mr. Kinsman, who, unfortunately, got as far as Bulawayo and then had to turn back on account of his wife's ill-health. Amongst others we have received are apologies from Mr. Swingler, Mr. Jacobs, Mr. du Plessis and Professor Orr. I need not mention any more names. You know their valuable services and you regret their absence to-day as much as I do. Travelling difficulties these days, coupled with shortage of staff, have prevented them from attending this Convention, much to their and our regret.

# Annual Report

The first item on our Agenda this morning is the annual report of our Secretary & Treasurer, which I now call upon him to read.

**Mr. Horrell:** Gentlemen,—I have the honour to submit the annual report, together with the balance sheet, for the last financial year.

### 1944 CONVENTION.

Since the last report was issued, as most members of the Association are aware, a most successful Business Convention was held in Johannesburg last May. Not only was there a record attendance but the discussions were of a very high standard and resolutions of a far-reaching nature were adopted.

It will be remembered that the agenda was so long that it had to be divided and the Conference was split into two sections and it was then only with difficulty that it was brought to a close on the Thursday afternoon.

### 1945 CONFERENCE.

Members have already been notified that the next Conference is to take place in Rhodesia from May 15th to May 22nd inclusive, and it should be understood that all members are invited to attend, i.e., Honorary Members, Council Members, Engineer Members, Associate Members and Associates.

Accommodation is very limited and therefore members should notify the Secretary immediately (if they have not already done so) if they are going to the Conference and the accommodation they require.

**FINANCIAL.**

It will be seen by the balance sheet attached that the financial position of the Association is quite sound and that the assets are most satisfactory. This, however, to a great extent is due to the fact that the usual annual conferences have not, until this last year, taken place for four years and the accumulated subscriptions have built up this reserve. It will be noticed, however, in the Revenue and Expenditure Account that the expenses of the recent conference have eaten up a considerable sum of this amount. This is due to two reasons: the heavy expenses involved in running the Conference and the cost of printing the Proceedings. It will be seen that the cost of these two items alone amount to more than the subscriptions for the year.

Unfortunately, it does not seem likely that the expenses can be reduced to any extent; in fact, if the Association has to resort to employing professional reporters, it may cost as much as it did in Johannesburg or even more. It therefore seems that the question of raising the subscriptions must be seriously considered.

**STATISTICS.**

The statistics of all electricity undertakings in the Union, Rhodesia and South-West Africa for the year 1944 have been compiled by the Secretary of the Association and the "matter" has been forwarded to Cape Town and is now in the hands of the publishers. It is hoped that the tables will be ready for distribution within the next six weeks.

It is regretted that quite a number of municipalities failed to submit their returns, despite requests to do so. One Engineer replied that he was far too busy to attend to such matters, and others, at least half-a-dozen, informed the Secretary that the previous year's figures would suffice. This, you will understand, is most unsatisfactory for, unless the "tables" are kept up to date, they will become valueless.

**HONORARY MEMBERS.**

At the last Conference Mr. George Swingler, who had recently retired from the position of City Electrical Engineer, Cape Town City Council, was elected an Honorary Member of the Association and, at the same meeting, it was decided that the same honour should be bestowed on Mr. A. T. Rodwell when he retired from the position of General Manager, Electricity Supply Undertaking, Johannesburg, at the end of December, 1944. His name is, therefore, included with Mr. Swingler's name in the list of those members.

The following members have been elected to the Association since the last report was issued.

**Council Members:** Municipal Council, Brandfort; Municipal Council, Windhoek.

**Engineer Members:** F. Anderson, Electrical Engineer, Port Alfred; H. Bickley, Electrical Engineer, Nigel; D. A. Bradley, Asst. Electrical Engineer, Port Elizabeth; J. F. Lategan, Electrical Engineer, Brandfort; R. Leishman, Chief Technical Asst., Johannesburg; R. R. Lyall, Electrical Engineer, Louis Trichardt; P. A. Meintjes, Electrical Engineer, Rustenburg; W. C. D. Smith, Electrical Engineer, Boksburg; H. T. Turner, Electrical Engineer, Umtali; S. T. Veltman, Electrical Engineer, Vryburg; V. E. Williams, Electrical Engineer, Windhoek.

The membership is as follows:

| | 1944 | 1945 |
|---|---|---|
| Honorary Members .. .. .. .. .. | 3 | 5 |
| Council Members .. .. .. .. .. .. | 66 | 70 |
| Engineer Members .. .. .. .. .. | 67 | 74 |
| Associate Members .. .. .. .. .. | 2 | 2 |
| Associates .. .. .. .. .. .. .. | 16 | 18 |
| | 154 | 169 |

I am,

Mr. President and Gentlemen,

Yours faithfully,

L. L. HORRELL,

Secretary and Treasurer.

## ASSOCIATION OF MUNICIPAL ELECTRICITY UNDERTAKINGS OF SOUTH AFRICA AND RHODESIA

### REVENUE AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st AUGUST, 1944.

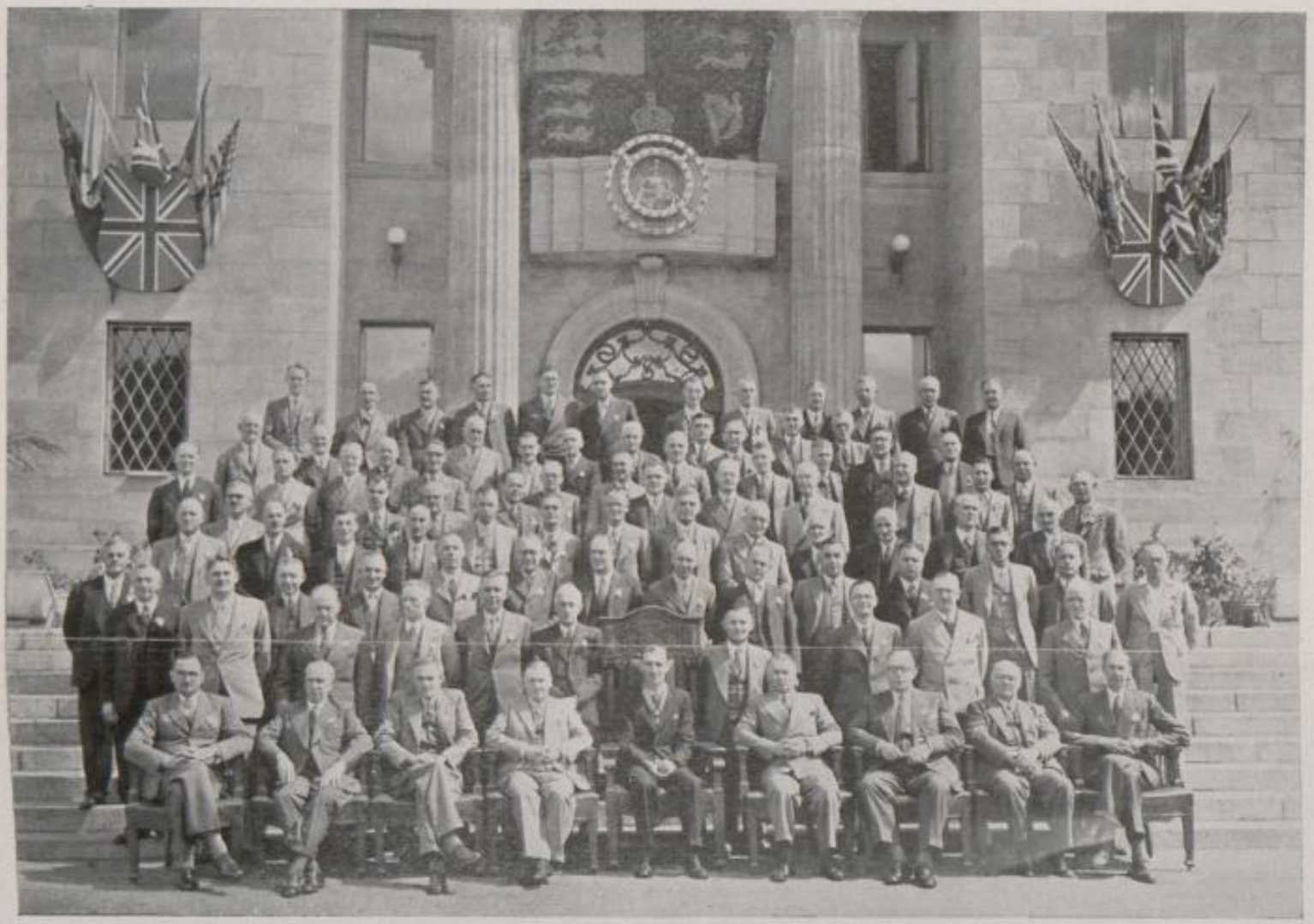
| | | | | |
|---|---|---|---|---|
| **Audit Fees** | | | £4 4 0 | |
| **Printing and Stationery** | | | 9 18 4 | |
| **Secretary** | | | | |
| Salary | £80 0 0 | | | |
| Fees re Statistical Tables | 20 0 0 | | | |
| | | 100 0 0 | | |
| **Secretarial Expenses** | | | 32 3 9 | |
| **Bank Charges** | | | 3 12 10 | |
| **Insurance—Presidential Badge** | | | 1 0 6 | |
| **Expenses re Group Promulgation of the Standard Wiring Regulations** | | | 19 16 5 | |
| **Rent** | | | 28 0 0 | |
| **Subscriptions written off** | | | 8 8 0 | |
| **Depreciation**—Fixtures and Fittings | | | 1 7 0 | |
| | | | | 208 10 10 |
| **Convention Expenses** | | | | |
| Entertainment | | | 42 10 0 | |
| Printing and Stationery, etc. | | | 76 5 7 | |
| Salaries and Honorariums | | | 90 3 2 | |
| | | | 208 18 9 | |
| *Less* Sale Proceedings | | | 9 8 6 | 199 10 3 |
| | | | | £408 1 1 |

| | | | |
|---|---|---|---|
| **Subscriptions** | £259 7 0 | | |
| **Statistical Tables** | 30 0 0 | | |
| | | 289 | 7 0 |
| **Interest**—United Building Society Fixed Deposit | | 3 | 0 0 |
| **Interest Accrued**—Union Loan Certificates | | 14 | 6 10 |
| **Balance**—being excess expenditure over Revenue | | 101 | 7 3 |
| | | £408 | 1 1 |

# Association of Municipal Electricity Undertakings

## OF SOUTH AFRICA AND RHODESIA

### MEMBERS AND DELEGATES AT SALISBURY & BULAWAYO, 20th CONVENTION, MAY 15th to 22nd 1945



BACK ROW (left to right) : R. Leishman (Johannesburg), W. G. H. Jarvis (Johannesburg), A. W. H. Tedder (Salisbury), F. Rettie (Bulawayo), B. V. Hawgood (Johannesburg), A. G. Rayston (Vereeniging), R. A. Hermanson (Salisbury), H. Bickley (Nigel), J. G. Robinson (Salisbury), C. R. Deglon (Salisbury), Councillor G. F. Bechett (Johannesburg), E. Brod (Salisbury).

NEXT TWO ROWS (alternately left to right) : A. E. Tarrance (Johannesburg), J. H. Law (Reporter, Johannesburg), F. E. Syers (Gatooma), E. R. Smith (Johannesburg), G. A. Dalton (Johannesburg), V. A. Bright (Johannesburg), W. Theron (Klerksdorp), A. Tilley (Johannesburg), C. R. J. Pilcher (Salisbury), H. Quick (Ladysmith), C. H. V. Baskerville (Salisbury), H. J. Groom (Salisbury), J. Russel (Johannesburg), Councillor C. W. Sinclair (Pretoria), Councillor P. D. van Heerden (Pretoria), A. A. Webb (Benoni), Councillor G. S. Eden (Kimberley), S. G. Mortimer (Johannesburg).

NEXT TWO ROWS (alternately left to right) : A. Rossler (Cradock), F. N. Pragnell (Cape Town), H. J. Gripper (Worcester), D. A. Bradley (Port Elizabeth), Councillor W. G. Meaker (Somerset East), G. G. Heasman (Fort Victoria), Councillor T. Boyde (Nigel), Councillor D. E. Ellis (Nigel), Councillor Traub (Worcester), O. E. Pritchard (Durban), Dr. P. J. S. de Wet (Stellenbosch), Councillor W. Liebenberg (Roodepoort), J. W. Regan (Salisbury), H. H. Jagger (Cape Town), H. L. Groom (Roodepoort), J. S. Trelease (Johannesburg), Councillor T. C. Davies (Springs), E. Elliott (Uitenhage), S. G. Redman (Johannesburg), C. R. Burton (Kimberley), A. L. Sanders (Johannesburg), B. Marchand (Witbank), W. Robertson (Salisbury), F. A. Perrow, (Bulawayo), H. J. Coulthard (Salisbury), J. S. Chisholm (Salisbury).

NEXT TWO ROWS (alternately left to right) : Councillor G. Brink (Pretoria), B. H. J. Tubb (Salisbury), G. E. Ferry (Cape Town), Councillor A. Haddow (Salisbury), Councillor Major G. L. Cooke, D.C.M. (Mafeking), J. Wilson (Pretoria), P. H. Newcombe (George), F. Stevens (Ladysmith), G. E. H. Jones (Mafeking), G. Drewitt (Johannesburg), D. W. Ritson (Stellenbosch), C. E. Gregor (Standerton), J. C. Downey (Springs), Councillor A. V. Dyer (Springs), P. L. Vergottini (Robertson), Councillor E. Boylan (Johannesburg), P. A. Meintjies (Rustenburg), Councillor S. Miller (George), Councillor A. N. Gibb (Salisbury), W. Rush (Potgietersrust), H. J. Turner (Umtali), G. A. N. Symons (Kroonstad), W. Rossler (Kroonstad), Councillor W. R. Love (Umtali), H. A. Prevost (Somerset East).

FRONT ROW (seated left to right) : W. N. Powell (Bloemfontein), J. C. Fraser (Johannesburg), H. A. Eastman (Cape Town), H.W. the Mayor of Salisbury (Councillor Chas. Olley), J. S. Clinton (President, Salisbury), J. W. Phillips (Bulawayo), Councillor J. Ohlson (Bulawayo), L. L. Horrell (Secretary-Treasurer, Johannesburg), G. R. E. Wright (Benoni).

## BALANCE SHEET AS AT 31st AUGUST, 1944

| | | | | | |
|---|---|---|---|---|---|
| **Standard Bank of South Africa Ltd.** | | | | | |
| Bank Overdraft | | | | 51 11 11 | |
| **Accumulated Funds** | | | | 880 11 1 | |
| Balance, 1st September, 1943 | | 981 18 4 | | | |
| *Less* Deficit for year | | 101 7 3 | | | |
| | | | | £932 3 0 | |

| | | | | |
|---|---|---|---|---|
| **Investments—Union Loan Certificates** | | | £768 5 1 | |
| Cost | 752 17 0 | | | |
| *Add* Interest accrued | 15 8 1 | | | |
| **Presidential Badge** | | | 31 8 9 | |
| **Sundry Debtors** | | | | |
| Outstanding for Books—I.M.E.A. | | | 8 14 2 | |
| **Subscriptions Unpaid** | | | 11 11 0 | |
| **Fixtures and Fittings** | | | 12 4 0 | |
| Balance, 1st September 1943 | 13 11 0 | | | |
| *Less* Depreciation | 1 7 0 | | | |
| **United Building Society** | | | | |
| Fixed Deposit | | | 100 0 0 | |
| | | | £932 3 0 | |

We report that we have examined the above Balance Sheet with the Books and Vouchers of the Association for the year ended 31st August 1944, and certify that in our opinion the above Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of affairs of the Association as at the 31st August 1944, according to the best of our information, the explanations given us and as shown by the Books.

Pretoria.

5th December, 1944.

WARREN & HOFMYR.

*Auditors.*

**The Mayor (Councillor Olley):** I should like to propose the adoption of the annual report and statement of accounts and, in doing so, again want to stress this fact that it appears that the balance sheet is not quite as good as it ought to be. Personally, I cannot help thinking that the time has now arrived when the Association should seriously consider raising the subscriptions of the various Councils. After all, the Councils are at present paying a very small sum of money, while expenditure generally has been increasing and you are getting to the stage when revenue must be obtained in greater measure than hitherto. Furthermore, there is always this question of travelling expenses which up to now the Executive members have paid. I think that either the Town Councils should make these contributions direct to the staffs or, alternatively, pay a larger sum of money in the form of subscriptions so that expenses could be met out of the Executive fund. But there is more in it than that. I visualise the day coming when it will be necessary for this organisation to have its own suite of offices; because, after all, when you become a big organisation representing investments in plant and amenities running into millions, it is only right and proper that you should have accommodation of your own, where you could not only hold Conventions, but carry on your ordinary administration.

All these things mean you must have more money and a bigger reserve than you have now, so I feel, as I said before, the time has arrived when you can ask Councils to pay more — something more than a mere few pounds a year, so that you can establish your organisation on a more solid basis.

With these few remarks I beg to move the motion.

**Mr. Fraser** (Johannesburg): I have much pleasure in seconding the motion and in asking you, Mr. Chairman, to endorse the Mayor's remarks.

Agreed.

# Election of President

**The Chairman:** I now call for nominations.

**Mr. Eastman** (Cape Town): Mr. Chairman, Ladies and Gentlemen,— In proposing Mr. J. S. Clinton as our President I feel it is necessary to refer to the position mentioned by the Mayor in his opening remarks, to the effect that Mr. Clinton will shortly be relinquishing his work as City Electrical Engineer in this city in order to undertake work which is not in the employ of a municipality. Ordinarily, when we elect a President of our Association, we contemplate that he will hold that office until the next Conference. Further, no person can hold office in the Association unless he is an Engineer Member. Therefore, if the proposal is agreed to, Mr. Clinton will relinquish the office of President at no distant date, but I suggest that that need not necessarily be a matter of difficulty. The Conference is continuing for some while yet, and before it ends it will be possible to review the position.

J. S. CLINTON, President, Salisbury

Mr. Clinton holds the office of Acting President at the present time, to which he was appointed by the Council when our Association was faced with the emergency created by Mr. Rodwell's retirement from municipal service last December. I hope, therefore, that in view of the excellent work which Mr. Clinton has done for the Association during his lengthy membership period, and also the work he has done for us—not only in the Council but in the presentation of papers at our Conferences, which papers have become classics of their kind—that this Conference as such will do him and itself the honour of electing him as its President. It would in my view be a very fitting gesture of goodwill on the part of the Conference towards him on his taking up new work in the immediate future.

**Mr. Fraser:** Mr. Mayor, Mr. Chairman, Ladies and Gentlemen,—It is my privilege to second the motion before this Convention. We are grateful to Mr. Clinton for having taken on the acting position when Mr. Rodwell resigned. He has willingly borne the burden of the affairs of the Association in addition to his normal duties and this, plus the fact that he has decided to leave Salisbury immediately after the Convention, has kept him an extremely busy man. I agree with Mr. Eastman that it would be a very fitting gesture on the part of the members of this Convention to elect Mr. Clinton as our President.

**The Chairman:** Are there any other nominations?

**The Mayor:** If not, then I declare Mr. Clinton President of the Association for the ensuing year. (Applause.)

Mr. Clinton then assumed office.

**The President:** Mr. Mayor, Ladies and Gentlemen,—I am afraid this election has rather caught me on the wrong foot. First of all, as you know, I am leaving here; secondly, I did not expect it, and only at the last moment did I understand from the Secretary I was expected to give you an address, or to prepare one in case I was elected.

# Presidential Address

**By J. S. Clinton,**

**City Electrical Engineer, Salisbury.**

## THE FUTURE OF THE ASSOCIATION OF MUNICIPAL ELECTRICITY UNDERTAKINGS.

The decision of the Convention to elect me is one I appreciate in view of my impending departure from Salisbury, and the fact that I shall, thereafter, no longer be in charge of a municipal undertaking. I am conscious of the honour. The long line of illustrious Presidents, the high standard of their contributions to the Association, and the measure of their success have created a tradition hard to live up to, but which example will be a staff on which I shall lean heavily.

It has been customary to allow your President freedom in the selection of the subject of his address. Mine is the future of our Association. Lest you feel any alarm at the presumption let me assure

you I have no intention of probing the distant future. I have no time machine: I am no prophet. The space time concept with which I shall deal is rather just a step beyond the "here now" of the physical world.

Although our engineering duties involve planning, we are all aware that the spate of planning must be controlled within practical limits. The complex reactions every social movement introduces demand that our steps be small ones, lest we lose stability and have to retrace our way. This world of ours is a complex one: any change we make disturbs a host of imponderables. We must therefore proceed with care.

With due regard for these factors, I nevertheless am of the opinion in the structure of our Association, there has been of late too little change. If it is to be a live organisation, of use to the community, it must follow the one stable evolutionary law, that in all things there shall be ceaseless change. Measured across a normal interval of time, the incremental difference may be of small magnitude. There must, however, be constant change.

The pioneers of our Association built the edifice upon the soundest of foundations. Throughout the years of our existence they continued to expand its activities. We, of the next generation, have a duty to make a like contribution to its welfare and the usefulness of the Association to our communities.

New blood is needed in a flock of sheep, even if only to retain the character of the wool. In the abstract things of life, no less than the physical, the injection of even reactionary views are necessary to ensure progress and so the maintenance of the life force that should animate our concerns. We may react violently, as to a serum, to any views that disturb the even tenure of our ways, but they will serve to arrest the otherwise inevitable decay of our minds. Engineering, you may remember, is essentially an introspective vocation. It tends to make an intravert more so. The more the need, therefore, to take stock of our Association, if not annually, at regular intervals.

May I therefore take you back over the major events from the date of the formation of the Association?

The Association was founded in 1915 with J. H. Dobson as its first President, and membership was confined to the Municipal Electrical Engineers of the Union of South Africa and Rhodesia. At the first Convention, held in Johannesburg, 22 members attended: of this number, only one, Mr. N. D. Ross, the Electrical Engineer of Potchefstroom, is still engaged in municipal service.

In 1919, at the Port Elizabeth Convention, the rules were amended to admit Hon. Members and Associates, the first Hon. Member elected being Dr. van der Byl, who was admitted in 1922.

In 1934, at the Salisbury Convention, a permanent Secretary and Treasurer was appointed.

In 1935, at the Pietermaritzburg Convention, new rules and constitution were approved, admitting Town Councillors as Council Members, as an outcome of which some 40 municipalities had their official representative on the membership list: the present title of the Association was then assumed. By 1944, 67 municipalities were so represented.

In 1936, at the Johannesburg Convention, the Association celebrated its "coming-of-age."

In 1922, the Association became affiliated with the home Association I.M.E.A. with a similar constitution as our Association now has.

The Association's principal representations are on the following committees:

(1) World Power Conference.
(2) S.A. Standards.
(3) S.A. Safety Precautions.
(4) S.A. Wireman's Registration.

Among other subjects dealt with since the Association was founded are the following:

(a) Wiring rules and regulations.
(b) Statistics.
(c) Relief of rates.
(d) Registration of contractors and licensing.
(e) Standards.
(f) Supply regulations.

The total number of members to-day are as follows:

| | |
|---|---|
| Hon. Members .. .. .. .. .. .. | 5 |
| Council Members .. .. .. .. .. .. | 72 |
| Engineer Members .. .. .. .. .. | 75 |
| Associate Members and Associates .. .. .. | 21 |
| | 173 |

It will be noted in the past there has been regular attention to the changing needs of the times. The Association has amended its constitution to enable it to perform its proper functions. We must continue to meet the changing conditions by realigning our approach to the problems of the day. In this connection, I throw out for the consideration of the delegates the following aspects:

(1) The alteration of the constitution to open membership in some prescribed form to a representative of the different allied manufacturing and commercial distributing engineering bodies, e.g., Cable Makers' Association, Chamber of Industries, etc.
(2) The alteration of the constitution to enable membership to be extended in a form to be determined to the whole of the engineering staff of an authorised electricity undertaking, e.g., student members.
(3) The alteration of the constitution to provide machinery for the training and examination of personnel in electricity undertaking, e.g., plant operators.

(4) The extension of membership to other authorised undertakers of electricity, e.g., Victoria Falls & Transvaal Power Co.

(5) The publication, regularly, of a journal particular to the problems and affairs of electricity undertakings, the direction of which shall be through the Executive of the Association.

(6) The increase of subscriptions, particularly for large undertakings.

(7) The appointment of a permanent full-time secretariat.

(8) A regular survey of the output per manhour of the industry in comparison with other parts of the world, and the assumption of responsibility for increasing our group industrial efficiency.

The foregoing exhaust to my mind the major issues affecting the administration, through the constitution, of the Association. It is not intended to conflict with the procedure for dealing with the several important matters before the Association at the present time, and upon which reports are awaited.

## 1. EXTENSION OF MEMBERSHIP TO THE MANUFACTURER AND DISTRIBUTOR.

There was a time when commercial engineers attending our annual meetings were regarded in some quarters as "hangers-on." I do not believe the view was ever general, but there has never been a clear-cut policy in regard to the status of visitors from engineering firms. We are all conscious of the contributions to our deliberations by these engineers, and I believe, to-day, value their presence amongst us. In no time past has the need been greater for close co-operation between the manufacturing, distributing and commercial communities and ourselves. There is no stigma attaching any section of the community, and the better we appreciate the problems of the other fellow, the sooner shall we reduce the consumption of manpower, which is the limiting cost of production.

You may feel the present methods of inviting representatives of engineering firms to participate provides ample scope for these aims. I do not. I believe we can cement the bonds of loyalty and break down past selfish motives on the part of the commercial community by bringing them into our Association in a form of membership you may approve; I believe we should not shoulder alone the responsibility for bringing about a reduction in the costs of electricity. The commercial and manufacturing industry must do its share and bear some of our responsibilities. Without responsibility we beget irresponsibility and, worse, indifference to our common problems.

My proposal might mean for a time limiting membership to representatives of the Chamber of Commerce, of Industry, and such bodies as the Cable Makers' Association. We then get the co-operation of the manufacturer, distributor, supplier and consumer within the confines of our Association. I do not need to stress the advantages.

## 2. EXTENSION OF MEMBERSHIP TO THE STAFF OF UNDERTAKINGS.

Delegates are aware that there is a limit, by definition, to the membership of the Association in regard to the staff of any undertaking. If our object of Association "(a) to promote the interests of Municipal Electricity Undertakings" is to be achieved, surely we need all the co-operation and help possible. If the whole staff has some stake in our welfare, we can surely lose nothing and, instead, reinforce the chances of succeeding in our objective.

Other bodies, the Institute of Municipal Treasurers and Accountants, have this provision in their constitution and, I venture to suggest, are a more powerful force in the municipal world because of it. In their affairs, the student is considered part of the group and his contribution not neglected. I cannot help liking, in this connection, the word recently resuscitated by the Americans — "synergy" — meaning the total result of the co-ordinated efforts of a number is greater than the sum of the individual contributions. In other words, the sum of 2 and 2 can be greater than 4. An appreciation of the underlying truth of this outlook is necessary.

Just to what extent members agree with me I do not know. No purpose is served by indicating the detailed amendments of the constitution a change of this form involves. I commend for the purpose an examination of the constitution of the Institute of M.T. and A.

## 3. PROVISION FOR THE REGULATION AND EXAMINATION OF CANDIDATES ENGAGED IN ELECTRICITY UNDERTAKINGS.

So, in regard to examinations, we like to tell our Government to do the job for us. Without any responsibility we can then sit back and criticise. Surely we as a body are the best equipped to do our own work. Is not, for example, the building industry best fitted to say what is a good mason or carpenter?

In many walks of life we are, to-day, feverishly passing the buck. If there is a duty we can pass on to a Government, another local authority, a board, a commission, we do so as a matter of course. If a community in a small town wants grass verges or sidewalks, the municipality must do it, irrespective of cost, whereas it might be much easier to pass a bye-law that each householder was responsible for his own frontage.

Again the example of the treasurers and accountants might be quoted. Once we have established the capacity for governing, we can have delegated to ourselves jobs we throw upon our legislators. They should be free to carry out their correct duties determining policy, etc. If we are to have any hope of continuing to enjoy a high standard of living, we must have a high output per head. I do not want to anticipate my remarks except to note that a properly educated and trained personnel is an essential pre-requisite to a rising output per capita. Without machinery which we should set up for the purpose, this will not come of its own.

## 4. EXTENSION OF MEMBERSHIP TO ALLIED UNDERTAKINGS OTHER THAN MUNICIPAL.

The survival of a municipal form of enterprise cannot have been the secret clause in our constitution. We have no need to doubt the wisdom of our existence. Fear begets suspicion, and lack of confidence in our future the seeds of "power" policies.

The electricity supply industry is concerned with its welfare, whether it be operated by the State, the local authority or private enterprise. We gain nothing by breaking down an industry into conflicting groups. We must identify ourselves with those groups which have common goals. The more we get together, the better shall we understand the merits of each other, and achieve that synergy of purpose more desirable than social security and schemes for full employment.

We have introduced as one of our objects (b), to bring Municipal Electrical Engineers and Chairmen and Members of Municipal E ectricity Committees together. In due course they met and found one another not such bad folk. Later we introduced the Council to our midst, including Mayors. We permit as Associates, Engineers of the Victoria Falls & Transvaal Power Company, Ltd., **where they serve municipalities**, to meet us on equal terms. No snobbery was intended, but does not the constitution in this respect tend towards isolationism and class interest?

Should we not all have a single purpose and meet as equals? Cannot the National Joint Electricity Board gradually emerge from an identity of interest? If so, is there anyone with vision to bring about the amalgamation and so re-design the constitution that there is one major object of association, the welfare of the electricity supply industry?

Do not forget we constitute a big nucleus. We achieve a great deal by meeting in different centres. In fact, this contributes largely to the success we have achieved. Does everyone really appreciate the value of this, and that its virtue is not shared by all forms of technical association? Its broad basis is a factor which should be borne in mind when debating the wisdom of still further augmenting the scope and usefulness of the A.M.E.U.

In many industrial organisations being set up to-day, class interest dominates its aims. Internal harmony and the promotion of their own welfare are prominent in the objects of association. In encouraging industrial relationships, Governments err in a like manner. The consumers' interests are overlooked. Nothing is laid down to discourage or prohibit restrictive practices. No spur is included to develop a desire to return to the public whatever is demanded by way of added remuneration or which, in effect, increase the costs of production. The form the corrective machinery should take we must design. We must not develop restrictive practices or create closed preserves.

**5. COMPLETE RESPONSIBILITY FOR A REGULAR JOURNAL OF ACTIVITIES.**

You are aware that the S.A. Engineer & Electrical Review is the official organ of the Association. Our thanks are due to the editor and staff for the manner in which our welfare and activities have been kept before the public. Some may feel that this efficient discharge of a duty for which we do not pay is ample for our needs. I do not. In any event, the least the idea deserves is an examination, the result of which might result in my views being upset.

**6. THE INCREASE OF SUBSCRIPTIONS.**

I fancy this suggestion may cause the collapse of the whole edifice which in my imagination I have created. Not long ago, my Council considered its subscription to a minor association, and approved of it (I shall leave the body nameless). The figure was 15 guineas. The electricity department, representing about 50% of the total city's budget, pays only 5 guineas to maintain our share of the A.M.E.U.

It seems hardly necessary to add that if work has to be performed, it naturally means expenditure. If the result is desired and worth while, it cannot be done for nothing. Many of our mother towns can afford much more to ensure the progress of the industry. If not, the Association has outlived its usefulness, and its meetings will lapse into an annual form of light relief and entertainment.

**7. THE APPOINTMENT OF A FULL-TIME SECRETARIAT.**

If we are to entertain any hope of achieving the aims herein recorded, I feel you will agree the hard work of our part-time Secretary and Treasurer will have to be supplemented by full-time assistance. There is no intention on my part to recommend hasty action. I want my views thoroughly examined by our able Executive or a sub-committee you may appoint. I cannot believe a live association can exist without this form of administrative assistance.

**8. A REGULAR SURVEY OF THE INDUSTRY AS A WHOLE.**

The ruling individualism of the pre-war era, it is clear, must accustom itself to a realisation of group interests and responsibility. One such duty is the maintenance of a rising output per head. In our industry, no less than any other, the need for increasing productivity is paramount. In order to demonstrate the differences in output per manhour in different countries, I have shown on Annexure A the trend up to 1940 in the various countries. The diagram has been extracted from Colin Clark's "Economics of 1960."

You will note the wide disparity between the figures for the U.S.A. and Britain being 2,150 I.U.'s and 1,380 I.U's respectively, with other countries still further behind. What we produce we can consume. None of the figures indicate such a high standard as to encourage a belief that we can rest on our oars. The question of full employment and under-utilisation of productive capacity is a local and temporary problem. The major issue is the means for increasing productivity. If you examine closely the output per head in the

various countries, you will agree that it is unlikely in Rhodesia and the Union we can figure prominently. There is an urgent need to give attention to this by all industries if we are to retain the high standard of living we enjoy from the advantages of mining and a large native population.

If we are to fulfil our duty to our fellows, it is necessary that we take the steps to achieve the objective by raising the output per manhour in our own industry. The Economist recently published a series of articles on a "Policy for Wealth," to which I commend all members. This address is not intended to be a dissertation upon methods by which output can be raised, but rather to outline what should be done to decide the methods.

I consider in this the Association has a function, if not a duty, to perform, and that nothing is being done about it. Furthermore, we have to act as a group extending a form of discipline over every member. When a standard for determining the industrial efficiency has been settled, it must rest with the Association to exercise control over the member undertakings whose efficiency lapses. The stage has passed where our individual concerns are entirely our own business. Fascist forms of growth may be alien and undesirable. We must not, however, entirely disregard the social force which that philosophy misleadingly interpreted. The force is one which our world and way of life must recognise, namely, the extent to which the group has an existence, the extent of our responsibilities to it, and most of all the amount of free individual action which is still essential to economic progress. The more freely we submit to self-discipline and correction, the more nearly do we attain that higher standard of conduct necessary for our common weal. We constitute the body best qualified to determine our efficiency. The rest of the community is busy about its own business. We do not need penal legislation, nor over-riding boards, to enforce the maintenance of an increasing output upon our industry. We should be aware of its need, and our awareness should enable us to design the machinery to promote such a policy.

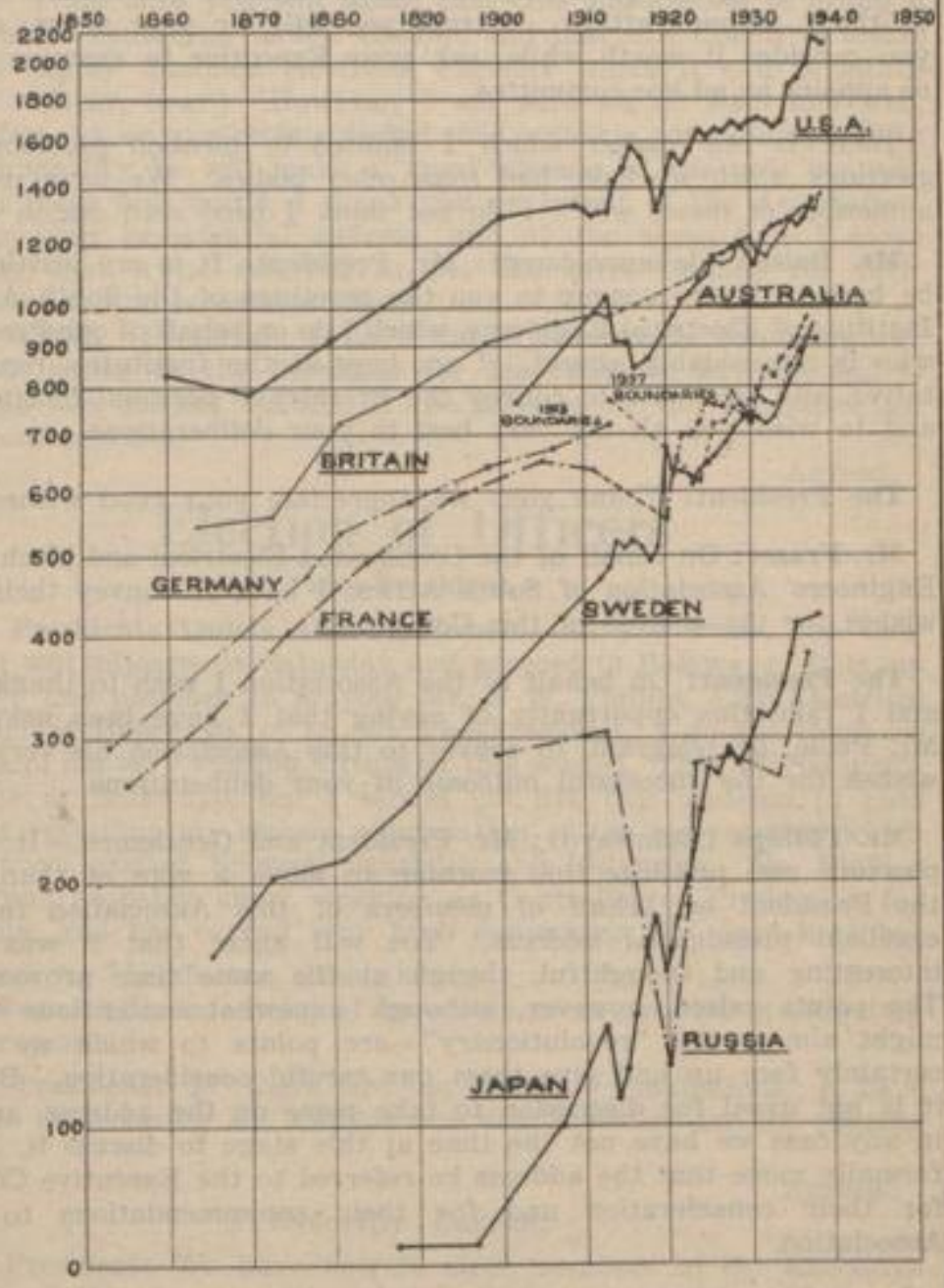
## 9. CONCLUSION.

Our virile Association is a monument to the foresight of that band of engineers who launched it on its career. We have a constant duty to perform. The inertia of the material world is equally a destroying force in abstract things. It must never be said of us that we failed the pioneering team and allowed the wheels they set in motion to slow up. What I have thrown into the arena for discussion is born of a desire to see the Association, of which I am glad to be a member, prosper. It can do so only by the integrated efforts of us all. The thing one holds dear is that which one must see with clear eyes, and of whose defects one is most conscious. We must be alert to discover latent desires for change, and be quick to assist their development. I, too, know the good points, none of which I want to see lost. We must, however, be sensible of an expanding world in which the desire for change is an evolutionary urge none must

ANNEXURE A

## REAL INCOME PER OCCUPIED PERSON IN WORK

### INTERNATIONAL UNITS PER 2500 HOURS WORK




IT SHOULD BE NOTED THAT THE DIAGRAM ABOVE REFERS TO INCOME PER PERSON IN WORK, WHEREAS THE DIAGRAM GIVEN IN "CONDITIONS OF ECONOMIC PROGRESS" REFERS TO INCOME PER HEAD OF OCCUPIED POPULATION, WHETHER IN WORK OR UNEMPLOYED.

disregard lest we remain in some archaic form to disappear in time, or else have to suppress the force till it explodes and destroys us.

It is not general for a President to introduce contentious matter into his address. I have done so, and tender my apologies. It is no use leaving the questions, nor was it intended you should dispose of them, without attack. I trust you will air your views, and if you consider it worth while, ask your Executive to examine them, or appoint an ad hoc committee.

There is one matter which I omitted to mention previously — greetings which we have had from other bodies. We have received a number of these, which I do not think I need read out in deatil.

**Mr. Dalton** (Johannesburg): Mr. President: It is my privilege to be here to-day to convey to you the greetings of the South African Institute of Electrical Engineers, which I do on behalf of our President who is unavoidably absent. I am here as the Institute's representative, and have also to convey the President's personal felicitations and to wish you all the very best in your deliberations.

**The President:** Thank you: we appreciate your good wishes.

**Mr. Fraser:** On behalf of the Certificated Electrical and Mechanical Engineers' Association of South Africa, I have to convey their best wishes for the success of this Convention.

**The President:** On behalf of the Association I wish to thank you, and I take this opportunity of saying that I have been asked by Mr. Poole, by telegram, to convey to this Association his very best wishes for the successful outcome of your deliberations.

**Mr. Phillips** (Bulawayo): Mr. President and Gentlemen,—It is my pleasure and privilege this morning to move a vote of thanks to the President on behalf of members of this Association for his excellent presidential address. You will agree that it was very interesting and thoughtful, though at the same time provocative. The points raised, however, although somewhat contentious—some might almost say "revolutionary"—are points to which we must certainly face up and give them our careful consideration. But as it is not usual for discussion to take place on the address, and as in any case we have not the time at this stage to discuss it, I will formally move that the address be referred to the Executive Council for their consideration and for their recommendations to this Association.

I am not going to say any more about the address, therefore, at this stage, but I hope I will be forgiven for making a personal reference to Mr. Clinton, as has already been done by the Mayor and Mr. Eastman, and I have no doubt before this Convention closes there will be many expressions of regret at Mr. Clinton's departure. But since he has referred to it in the first paragraph of his address, I feel I am not out of order in making such a personal reference.

I have known Mr. Clinton for many years, and most of that time we have been keen, though very friendly, rivals. At the same time, we, as colleagues and members of the same profession, have always worked together and have mutually discussed any problems that have arisen. I am sure you will agree that this Association is losing a very valued counsellor in Mr. Clinton, and that this Colony is losing a very highly qualified electrical engineer which it can ill afford to do. (Hear, hear.) However, I am sure we all wish him well, and I for one am perfectly satisfied that with his outstanding ability and personality he will make a great success of the new venture.

With these few words, I thank you on behalf of the Association, sir, for your presidential address, and at the same time I move formally that it be referred to the Executive Council for their consideration and recommendations.

**Mr. Wilson** (Pretoria): I have much pleasure in seconding the vote of thanks to the President for his excellent address, and in referring the subject matter of the address to the Executive for their consideration.

Agreed.

# Election of Officers

### Vice-President.

**The President:** Ladies and Gentlemen,—As you know, the Convention will adjourn on Saturday and proceed to Bulawayo. It is my privilege and pleasure to propose Mr. J. W. Phillips, City Electrical Engineer of Bulawayo, to be our Vice-President. I do not think we need extol his very sterling virtues at this session. That will no doubt be done at Bulawayo, but I should not like this occasion to pass without recording my sincere appreciation of the co-operation which has always existed between Salisbury and Bulawayo. Mr. Phillips is, as you probably know, working as Controller of Production for Rhodesia, and has earned very high encomiums, not only here but elsewhere for his efforts. (Hear, hear.)

**Mr. Powell** (Bloemfontein): I have very great pleasure in seconding your proposal.

**The President:** If there are no further nominations, I have pleasure in declaring Mr. Phillips our Vice-President for the ensuing year.

Agreed.

### Executive Council.

**The President:** We have now to elect members to the Executive Council of the Association, and I call for nominations. I should explain for the benefit of members that the immediate Past Presidents are ipso facto members of the Executive. Those will be Mr. Nicholas and Mr. Eastman. Then there is myself, and Mr. Phillips, your Vice-President. There are four Engineer Members, so there are four offices to fill. The present Engineer Members are Mr. D. J. Hugo, Pretoria; Mr. C. Kinsman, Durban; Mr. J. C. Fraser, Johannesburg; and Mr. G. R. E. Wright, Benóni.

The following nominations were made:

| | Proposed by | Seconded by |
|---|---|---|
| Mr. C. Kinsman (Durban) | Mr. Bradley | Mr. Powell |
| Mr. A. Foden (East London) | Mr. Powell | Mr. Stevens |
| Mr. D. J. Hugo (Pretoria) | Mr. Bradley | Mr. Powell |
| Mr. G. R. E. Wright (Benoni) | Cr. Webb. | Mr. Phillips |
| Mr. H. J. Gripper (Worcester) | Mr. Powell | Mr. Ritson |
| Mr. W. N. Powell (Bloemfontein) | Mr. Ritson | Mr. Jones |
| Mr. J. C. Fraser (Johannesburg) | Mr. Phillips | Mr. Wright |

**Mr. Powell:** I am sorry, but I must decline nomination at this stage for reasons which I think will be made clear to members later.

**The President:** There are six nominations — Messrs. Kinsman, Foden, Fraser, Hugo, Wright and Gripper. A ballot will therefore be held, and I call for nominations for scrutineers.

As scrutineers, Mr. Eastman proposed Mr. Burton, of Kimberley, and Mr. Powell proposed Mr. Ritson, Stellenbosch.

Agreed.

**The President:** There are two vacancies for Councillor Members of our Executive. The present members are Councillor H. H. Verity (Johannesburg) and Councillor C. Olley (Salisbury), with alternates: H. F. Gearing (Cape Town) and R. M. Thomas (Durban).

**Councillor Eden** (Kimberley): I propose Councillor H. E. Gearing, of Cape Town.

**The President:** In regard to Councillor Eden's proposal, I might say that it has been usual in the past to elect as Councillor Delegates a Councillor of the town at which we have been invited to hold our next Convention, as well as a Councillor of the town where we are holding our Convention. For the information of those present, I may say that you will shortly receive an invitation from the City Council of Bloemfontein to hold the next Convention in that city. I think, therefore, that it might be opportune to postpone the election of Councillors until after the next item has been dealt with: that is, Item 4.

**Councillor Eden:** In view of that, with permission, I withdraw my proposal.

Agreed.

# Venue and Provisional Date of Next Convention

**Councillor Pritchard** (Durban): Mr. President and Gentlemen,— Speaking on the subject of Council Members I should like to put forward this suggestion to your Executive. Whether it is adopted or not is entirely in your hands, but I should like to point out, as you are all probably well aware, Council Delegates who are Chairmen of Electricity Committees are subject to revision and change every

twelve months. That means that an individual who is elected a Council Member at this Convention may not be holding the position of Chairman of the Electricity Committee at the ensuing year, and this is a point I should like the Executive to take cognizance of. As an example we have as Council Member, Councillor R. M. Thomas, my predecessor, who to-day is not with us in view of the fact that he is no longer Chairman of the Electricity Committee. So, if I may be permitted to put forward a suggestion, it is this—that we designate the town where the gentleman may be a member of the Town Council, and the City Council would then designate the Councillor concerned and notify your Association.

**The President:** May I read the rule referring to the election and qualification of Councillor Members:

> "The Member whose Chief Electrical Engineer shall have qualifications acceptable to the Council of the Association shall be the Committee appointed by the Municipality or Local Authority to have control over its electricity undertaking and shall be represented as regards its qualifications to vote by one member of such Committee."

I feel that as far as the Constitution does permit us to have a member of the Electricity Committee, it would be in order to adopt Councillor Pritchard's suggestion, viz., that we appoint the town and not the Councillor by name.

**Councillor Pritchard:** May I further suggest that he be the Chairman of the Electricity Committee of the particular town concerned.

**The President:** Unfortunately, the Constitution states "one member of such committee," so I am afraid by so doing we would be going outside the strict wording of the Constitution. Therefore I think the town itself must automatically decide that question.

We now revert to the item "Venue and Provisional Date of next Convention" and, as we have received an invitation which has been addressed to your Executive, I will call upon the representative of the Bloemfontein City Council to speak.

**Mr. Powell:** I must apologise for the non-attendance of the Bloemfontein Councillor Member. In the circumstances I have to state that I have been authorised by the City Council of Bloemfontein to invite the Association to hold its next Convention in that city, and if you decide to go there I think you will have a happy time. Bloemfontein, which is known as the "Centre City," is most conveniently situated, and it also enjoys a high reputation for the welcome given to conferences. As regards the date, may I suggest May as a suitable month.

**The President:** On your behalf, Ladies and Gentlemen, I must thank Mr. Powell for his kind invitation but, before accepting, in the constitutional manner I must ask, "Are there any competitors?" If not, we accept, and the Executive will decide the actual date in due course. (Applause.)

I now call for nominations for Councillor Members and, later on, Alternates, to the Executive Council.

**Mr. Phillips:** I have pleasure in proposing a Councillor from the City of Bulawayo.

**Mr. Wilson:** I beg to second.

**Mr. Powell:** I nominate the Council Member of the Bloemfontein Council.

**Mr. Bradley:** I have pleasure in seconding.

**The President:** We should like two alternates and, as we are meeting here it will be useful to have a member from the Salisbury City Council.

**Mr. Phillips:** I have pleasure in proposing a Council Member from the Salisbury City Council.

**Mr. Wilson:** I second that.

**Councillor Beckett** (Johannesburg): I have pleasure in proposing Councillor Boylan as alternate.
Seconded by Mr. Fraser.

**The President:** If there are no other nominations I declare those two gentlemen duly elected. (Hear, hear.)

# Standing Committees

**The President:** We have a number of Standing Committees, and the programme lists the members of the Association who are at present representing you on those Committees.

**South African Standards Institute.**

The first is the S.A. Standards Institute. Your present representatives are Messrs. G. R. E. Wright, of Benoni, and Mr. D. J. Hugo, of Pretoria (alternate).

**Mr. Powell:** I propose the re-election of these two gentlemen.

Agreed.

**World Power Conference.**

**The President:** The next is World Power Conference, your representative being Mr. A. T. Rodwell.

**Mr. Fraser:** I have pleasure in nominating Mr. H. A. Eastman to take Mr. Rodwell's place, and I hope it will not be long before he actually represents us at a conference.

Agreed.

**Safety Precautions Committee.**

**The President:** Next is the Safety Precautions Committee, the present representatives being Mr. J. C. Fraser and Mr. G. R. E. Wright.

**Mr. Eastman:** I have pleasure in proposing the re-election of those two gentlemen on that Committee.

**Mr. Stevens** (Ladysmith): I beg to second. Agreed.

**Electrical Wiremen's Registration Board.**

**The President:** Next we have the Electrical Wiremen's Registration Board, Mr. A. T. Rodwell being our representative.

**Mr. Powell:** I have pleasure in nominating Mr. Fraser, who has this matter very much at heart.

**Mr. Bradley:** I second the nomination. Agreed.

**Auditors.**

**The President:** The next item is a resolution in regard to our Auditors.

**Mr. Eastman:** With the change at the end of our financial year, it is necessary, in terms of our Constitution, to appoint Auditors for the ensuing year, and to pass a resolution in regard to the operation of the bank account with the Standard Bank. I move that the Association retains the services of our present Auditors, Messrs. Warren & Hofmeyr, for the ensuing year, and that the Convention re-affirms the usual banking resolution in regard to the operation of the bank account.

**Mr. Fraser:** I second. Agreed.

**The President:** I have now received from the scrutineers the result of the ballot for Engineer Members to the Executive Council. They are Messrs. Hugo, Kinsman, Fraser and Wright. I declare them elected and congratulate them. (Hear, hear.)

# REPORTS

**The President:** As we have been rather quick in getting through the first part of our business, if you agree, we can carry on for half-an-hour with the afternoon's agenda.

Agreed.

The first report is that of the World Power Conference. I call upon Mr. Fraser to read the report in Mr. Rodwell's absence.

# World Power Conference

**(Report No. 2) By Mr. A. Rodwell.**

At our last two Conventions I have pointed out that nothing in this direction could be achieved during the world war, and expressed the hope that such organisations would again function in the near future for the advancement of science and world-wide betterment.

As President at our last Convention held in Johannesburg, I asked if you desired to elect a representative on the above organisation and expressed the opinion that I did not think it necessary (under the circumstances) at that time. You, however, did me the honour to re-elect me as your representative.

The war clouds are now lifting in Europe and it is hoped that the organisation will soon be in a position to take up the work and proceed on its career of usefulness.

There being no comments, Mr. Bradley proposed and Mr. Powell seconded the adoption of the report.

Agreed.

# Safety Precautions Committee

(Report No. 3) By Mr. J. C. Fraser.

I have to report that the Safety Precautions Committee met twice since the Association had its Convention in Johannesburg last year.

The Committee has drafted regulations for the requirements of medical and industrial X-ray and electromedical apparatus. A copy of these draft regulations has been forwarded to the Director of the National Physical Laboratory, Teddington, Middlesex, England, with the request that the British X-Ray & Radium Protection Committee favour the Safety Precautions Committee with its comments. When these comments have been received it will be the purpose of the Committee to formulate the final draft.

The Committee also had under consideration several communications in connection with the Standard Regulations for the Wiring of Premises, one of which was the Association's letter dated the 5th January, 1944, which dealt with a number of suggestions in regard to the modification of the regulations which arose out of the discussion at the last Convention. These matters have been dealt with and a great deal of discussion arose over item 5 of the Association's letter, which deals with the earthing of wireless sets. This matter is still under discussion and will be dealt with at the next meeting of the Committee. Most of the other items, however, were amended and will be submitted as a recommendation of the Committee to the S.A. Institute of Electrical Engineers to be included in the second edition of the Standard Wiring Regulations.

**The President:** In formally moving the adoption of the report, I am sure we are very much indebted to our representatives for the excellent work they have put in during the past year.

**Mr. Eastman:** In regard to the issue of the Second Edition of the Standard Wiring Regulations, which presumably includes a number of alterations from the previous edition, I want to make it clear that this edition cannot be put into effect by Municipalities without complying with the usual formalities involved in the amending of statutory regulations. It is not sufficient merely to publish the Second Edition of the Regulations and then to expect municipalities automatically to have the power to enforce those regulations.

**Mr. Fraser:** Mr. President and Gentlemen,—May I apologise for the error in the report—the date—which should be 5th June, 1944. As regards the second point, the position, as far as I am aware, is that the Second Edition will contain any amendments to the original Standard Wiring Regulations that the Safety Precautions Committee have considered necessary, together with any additional items which have been dealt with by this Committee.

**Mr. Wright** (Benoni): In view of the delays in the issue of the Second Edition, I have been authorised by the chairman of the Safety Precautions Committee to let you know there will be a small reprint of the First Edition, which will be available.

**Mr. Gripper** (Worcester): Are these modifications and suggestions which have been put to this Committee those which came from the discussions at the last Convention? Will we have any opportunity of knowing before this Convention adjourns which of those that have been previously mentioned have been put forward by the Committee and which have been considered by that Committee as being unnecessary to include in the Second Edition?

**Mr. Fraser:** If any member has any queries to raise and will see me during the Convention, I will be pleased to advise him of the position.

# Electric Overhead Line Regulations

**(Report No. 7) By Mr. J. C. Fraser.**

Members were advised by circular letter as to the reasons for the formation of this Committee and that the Executive Council had nominated myself to represent the Association on the Committee, which was formed by the South African Institute of Electrical Engineers to prepare a code for the guidance of Municipal Undertakings who may find it necessary to undertake the erection of overhead power lines.

Representatives of the Government Mining Engineer and the Chief Inspector of Factories have been nominated to this Committee and invitations have also been addressed to other Institute bodies and organisations to appoint representatives.

So far there has been no meeting of this Committee.

I now move the adoption of the report.

**Mr. Phillips:** I second the motion.

**The President:** Our representatives have done a very good job of work. We in Rhodesia do not get the benefit of what they have done, but nevertheless we recognise that the welfare of the various communities in the Union has been considerably improved in this way and our representatives deserve a vote of thanks for their energy and enthusiasm.

Before opening the matter for discussion, with your permission, Gentlemen, we will now adjourn for luncheon.

Agreed.

The Convention resumed at 2.45 p.m.

**The President:** In the absence of Mr. Rodwell I will call on Mr. Fraser to read the report on the Electrical Wiremen's Registration Board.

# Electrical Wiremen's and Registration Board

**(Under the Electrical Wiremen's & Contractors Act 1939)**

**(Report No. 4) By Mr. A. Rodwell.**

At the last Convention held in April, 1944, the activities of the Board up to that date were reviewed by its Chairman, whose remarks are recorded in the proceedings.

During the past year the work of the Board has proceeded smoothly, 13 meetings have been held and the following figures show the progress which has been made:

Number of applications to date:

| Area. | |
|---|---|
| Johannesburg .. .. .. .. .. | 1,406 |
| Pretoria .. .. .. .. .. .. | 323 |
| Cape Town .. .. .. .. .. .. | 722 |
| Natal (including Durban) .. .. .. .. | 575 |
| Port Elizabeth .. .. .. .. .. | 252 |
| East London .. .. .. .. .. | 129 |
| Orange Free State .. .. .. .. .. | 145 |
| Kimberley .. .. .. .. .. .. | 102 |
| Total .. | 3,654 |

An increase of 314 during the year.

Number of applicants registered 261, making a total of 2,161.

Number of applicants accepted for examination 206, making a total of 945.

Number of applicants refused 69, making a total of 419.

Number of applicants not finally dealt with 1,074.

Two written examinations were held, attended by 269 candidates. Approximately 30% passed both sections and 20% failed both sections; the remainder passed one of the sections only. At the five practical examinations held, 210 candidates presented and only 15 failed.

As from the 1st July, 1944, the following additional Magisterial Districts were determined in terms of Section 18 of the Act with the effect that the prohibitive provisions were applied to these areas:

| | | |
|---|---|---|
| Pretoria. | Potchefstroom. | Boksburg. |
| East London. | Germiston. | Nigel. |
| Pietermaritzburg. | Brakpan. | Vereeniging. |
| Bloemfontein. | Benoni. | Roodepoort. |
| Klerksdorp. | Springs. | Krugersdorp. |

This action resulted in a rush of applications for registration from the areas affected, chiefly from those who had hitherto adopted an apathetic attitude toward the requirements of the Act. Difficulties arose in some towns owing to the limited number of registered wiremen available but these are gradually being surmounted as additional men become qualified.

Seven prosecutions for offence under the Act were instituted. Each of the four cases decided to date were successful and fines were inflicted. The remaining three cases have not yet been heard.

In the very few cases in which protests or appeals, against decisions of the Board have been made to the Minister, the Board's decisions have been upheld.

Regarding the registration of electrical contractors under the Act, the limited staff at the disposal of the Board has somewhat delayed progress toward the co-ordination of the various views expressed on the subject, but it is hoped that concrete proposals for a suitable amendment to the Act will be placed before the Association at an early date.

Applications for registration are still being received at the rate of approximately 25 per month; these include applications from:

(a) Apprentices who have just completed their contracts.
(b) Wiremen who have been aroused from their lethargy in newly determined areas.
(c) Applicants released from military service.

In the latter category some of the applications from men where training has been interrupted by a period of active service are difficult to decide equitably. The policy of the Board is to treat each of such cases on its merits and as sympathetically as possible, having regard to the objects of the Act.

As our Association representative on the Board, I desire to thank the Chairman of the Board, Mr. Charles H. Clutterbuck, for furnishing me with the necessary statistics for this report, and for his never-failing courtesy and energy in carrying out the work of the Board.

Mr. President and Gentlemen,—I have pleasure in formally moving the adoption of the report.

Seconded by Mr. Powell. Adopted.

# Factories, Machinery and Building Act, 1941

**(Report No. 5) By Mr. L. L. Horrell.**

Very soon after the promulgation of the Act, difficulties were encountered in deciding exactly which employees came under the provisions of the Act.

(1) After some examination it became evident that municipal employees could be divided into the following three groups:

(a) Those who for all purposes definitely come under the Act.
(b) Those who for certain days of the week, or for portions of certain days, come into premises designated as factories, and who on other days are employed in or about premises which are not factories.
(c) Those whose employment completely excludes them from the provisions of the Act.

From a practical point of view, the municipality decided to place groups (a) and (b) under the provisions of the Act, and not group (c). To this extent they were going beyond the strict legal requirements of the Act in awarding to Group (b) the privileges beyond those to which they were entitled, but it was the only practical way of solving the problem.

The result of this classification was to create the following serious anomaly:

(2) Two artisans were both engaged as fitters: one actually at the works and the other in installing new services in private homes. Prior to the promulgation of the Act these two artisans were both treated in the same manner and received equal conditions of employment. Now, as a result of the Act, the former artisan becomes an employee entitled to all the privileges of the Factories Act, while the second artisan does not rank as a factory employee and is deprived of all the privileges. This gives rise to dissatisfaction among various sections of the municipal employees.

(3) The municipality was by no means convinced that the Sewage Disposal Works fell under any of the definitions of Section 3, but the Department ruled that it was in fact a factory and the employees concerned were accordingly brought under the provisions of the Act in terms of the above classification of employees.

(4) While it is appreciated that under the Act wide powers must be given to inspectors, there have been cases where the technical equipment of highly specialised branches, e.g., the gas works, has been criticised. It is in some cases doubtful whether inspectors have a sufficiently high technical knowledge of machinery and plant to offer suggestions as to equipment.

(5) The requirement of the Act for submission of plans is often very difficult to comply with. The workshops and premises contain machinery of a highly technical nature, which has been committed to plans. If the requirements of registration necessitate reprints of these plans, considerable trouble and expense is involved, and it is considered that an inspection by the Factory Inspector should suffice.

(6) Section 19 prescribing ordinary hours of work in factories has perhaps been responsible for the most important anomaly of all. Until the promulgation of the Act all employees were engaged on a uniform 48-hour week. As a result of Section 19, certain factory employees were now enjoying the maximum of 46 hours per week, anything in excess of that to be paid for at overtime rates; other factory employees, e.g., electricity workers, **also factory hands, were required to work 48 hours for the same pay that others were now getting for 46 hours' work,** without any overtime rates for the extra two hours. A large number of employees who were not covered by the Act had to continue the 48-hour week. The position was further aggravated by the Regulations of the Control of Industrial Man Power, which until the 15th May, 1943, imposed for the class of employees affected a minimum working week of 54 hours in some cases, and 51½ hours in other cases.

The anomaly of the electricity workers was removed after almost a year by the Minister prescribing certain minimum conditions for continuous activity which required shift workers working the 48 hours to be paid overtime for the last two hours.

(7) Because different employees were engaged with different rates of remuneration, e.g., per hour, per day, per week or per month, considerable administrative difficulty was experienced in calculating the remuneration for overtime due to these employees.

(8) Prior to the Act coming into force a uniform working week of 48 hours was composed of five days of 8 hours 40 minutes each, and one day of 4 hours 40 minutes. This was uniform throughout the municipal service, and entailed no difficulty from an administrative point of view. The Act, however, requires the working week to consist of a maximum of 46 hours, divided up into a working week of 6 days. It was found that uniformity was impossible, as each department had to divide up the 46 hours to suit its own requirements. In consequence a variety of different working hours was introduced, e.g., some departments worked five days of 8 hours 20 minutes and one day of 4 hours 20 minutes; others worked five days of 8 hours 15 minutes each, and one day of 4 hours 45 minutes. This involved different branches commencing work at different hours, with the result that from a central staff point of view difficulties in the control of daily earnings were considerably increased.

(9) This section also provides that any overtime for a total period not exceeding 10 hours may be worked in any one week. The case of a man doing stand-by shift in the Johannesburg Waterworks provides an example of the fact that, unless the Minister granted an exemption, the nature of the work constituted a contravention of the Act. In case of any possible breakdown (which might not occur and which in the majority of cases usually never occurs), men were required to do a stand-by shift, which in terms of the Act amounted to overtime, as they were not free to leave the premises. This stand-by period exceeded 10 hours, and if the provisions of the Act were to apply the anomaly resulted that, by carrying out certain provisions of the Act in respect of overtime, this constituted a contravention of other provisions of the Act limiting hours of overtime. To overcome this the Union concerned and the Council have arrived at some agreement and the Minister is expected to grant the necessary exemption.

(10) A further anomaly, difficult to understand at the time, was that soon after the Act came into operation the generation of electricity was declared to be a continuous process activity, with the result that these employees had to work 48 hours as mentioned above. To the Council's mind the working of the Gas Department was just as much a continuous process as the Electricity Department. The Minister refused the application for the Gas Works and Abattoirs to be declared continuous process activities, with the result that the Electricity Department had more onerous conditions than the Gas Department. This caused dissatisfaction in the department concerned, but the anomaly has been removed as the result of the Minister's now applying the same conditions to all activities in which continuous processes are necéssary.

(11) Section 20 dealing with Sunday and overtime pay has also been the subject of considerable difficulty. Read literally, the section requires double the remuneration of an ordinary working day to be paid for any period of time worked on a Sunday. The class of employee working on a Sunday must be considered under two headings:

(a) Continuous process shiftsmen, and

(b) Any other factory worker working on Sunday.

Consider the cases of shiftsmen working the following hours:

| Hours of shift. | Remuneration flowing from Section 20. |
|---|---|
| (a) 11 p.m. Saturday to 7 a.m. Sunday .. .. | 17 hours. |
| (b) 7 a.m. to 3 p.m. Sunday .. .. .. .. | 16 hours. |
| (c) 3 p.m. to 11 p.m. Sunday .. .. .. .. | 16 hours. |
| (d) 11 p.m. Sunday to 7 a.m. Monday .. .. | 23 hours. |

The strict application of the Act would result in the shift being rewarded by payment of the number of hours set opposite the period above, owing to the fact that either the whole shift or portion thereof occurred on a Sunday. It will immediateley be observed that for the same number of hours worked by four different shiftsmen, (a) gets 17 hours, (b) and (c) 16 hours, and (d) 23 hours. The argument that extra pay is due because a Sunday is included can have no application to the above table, as the Sunday factor is common to all four shifts cited. After considerable correspondence with the Department of Labour this anomaly was largely removed by a ruling from the Department of Labour based on two grounds:

(a) The commencing hour of the shift was to determine its nature; in other words, where a shift commenced on a Saturday it was to be paid for at ordinary rates as an ordinary shift, and where a shift commenced on a Sunday it was to be paid for and treated as a complete Sunday shift. This had the effect of bringing about two uniform shifts, one of 8 hours and one of 16 hours, for shiftsmen, thereby eliminating the 17 hours and 23 hours.

(b) Any other factory employee working on a Sunday is entitled on a strict interpretation of the Act to double pay for the number of hours ordinarily worked. This would normally be 16 hours, but as has already been pointed out supra, the result of the Factories Act has been to remove the uniformity of working hours and introduce different hours for different departments. It was at first sought to arrive at the ordinary hours worked per day by dividing the week of 46 hours by the 6 days worked during the week, and thereby arriving at a standard ordinary day of 7 hours 40 minutes. The Department of Labour, however, ruled against this, and said that where five out of six working days consist of more than 7 hours 40 minutes it was not fair to assess an ordinary day on this basis of 7 hours 40 minutes. As a result, the ordinary working day is in some cases 8 hours 15 minutes, in other cases 8 hours 20 minutes and in the third class of case 8½ hours. Thus, if any employee, other than

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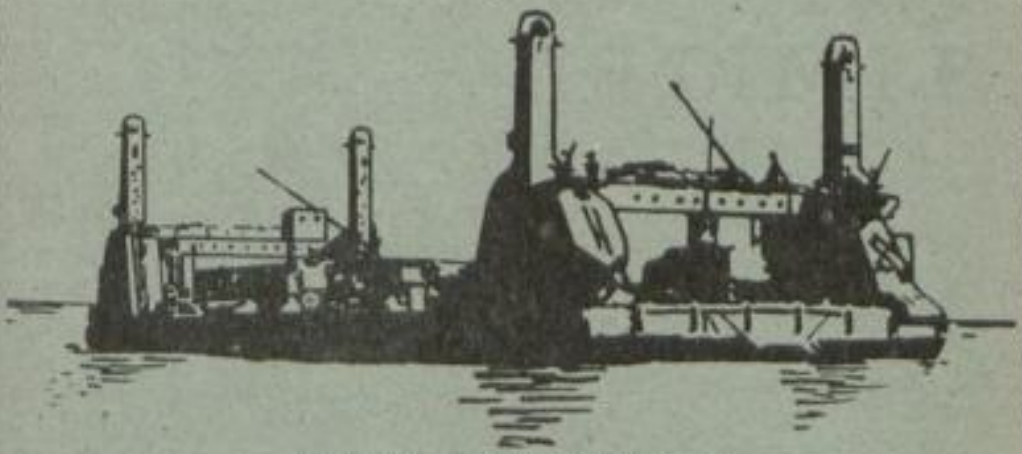

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a continuous process shiftsman, works on a Sunday, he must be paid either 16½ hours, 16 hours 40 minutes, or 17 hours, quite irrespective of the actual period of time worked by him. Thus, an employee working 10 minutes on a Sunday may be entitled to 17 hours' pay. This is considered quite inequitable, and is considered to be the most glaring anomaly at present calling for modification. At one stage the Department of Labour appeared to appreciate this anomaly, and intimated that the difficulty could be solved by paying this type of employee double the actual period worked, with a minimum of 4 hours' pay for 2 hours' or any portion thereof worked on a Sunday. Thus, 10 minutes, or anything up to and including 2 hours, would receive 4 hours' pay, 3 hours' work would receive 6 hours' pay, etc. The Council was strongly advised to make application on these lines by the Department of Labour, and accordingly did so, but for some unaccountable reason the application was turned down and the strict meaning of the section applied insofar as this class of employee is concerned. The justification for this has been said to be that where an employee is called out on a Sunday his whole Sunday is disturbed, and he is therefore entitled to double pay for a full day's work. This argument seems to be negatived by the Minister himself in the case of continuous process shiftsmen, as they are required to work their full shift of 8 hours, but are entitled to remuneration only at the rate of time-and-a-half, which the Minister considered to be equitable for proclaiming continuous activity.

This latter requirement of time-and-a-half to a Sunday shiftsman was introduced by the Minister in his minimum conditions for continuous processes, and signifies a further variation of the 16 hours shift indicated above, reducing the remuneration for a shift from 16 hours, which was the Department's first ruling, to 12 hours, in terms of its now being declared a continuous activity. If it is considered equitable (and it apparently has been as it is the Minister's own condition for continuous process work) to reward a shiftsman's full 8 hours' employment with a maximum of 12 hours' pay, then it is very difficult to appreciate how 10 minutes' work on a Sunday in the case of another employee requires, in some cases, 17 hours' remuneration, and in no case less than 16½ hours' remuneration. If the disturbance of an employee's Sunday for a full working shift of 8 hours is considered to be satisfactorily remunerated with 12 hours' pay, then a fortiori the interference with a Sunday only to the extent of 10 minutes is amply rewarded by the payment of a minimum of 4 hours.

The case of the employee other than a continuous shift worker working on a Sunday for a period longer than 8½ hours must be considered. Such an employee may be engaged on some emergency job requiring him to work, say, 10 hours. For the first 8½ hours he receives 17 hours' pay. The Act is quite silent as to his remuneration for the remaining 1½ hours. There is a definite distinction between overtime rates of pay and payment for Sunday work. If this 1½ hours is to be regarded as overtime it should be paid for at the rate of time-and-a-third, in terms of the Act, but, as is

probable, it is to be regarded as Sunday work, as is the case with the first 8½ hours worked, it may possibly mean that he is entitled to a further 17 hours for the extra 1½ hours worked on Sunday. Thus, for a total of 10 hours worked he is entitled to 34 hours' pay, whereas the shiftsman who works only two hours less gets only 12 hours. In other words, the extra hours worked by the non-shiftsman bring him in an additional reward of 22 hours' pay. These facts all serve to indicate that the whole question of payment for work on a Sunday to an employee other than a shiftsman requires to be carefully revised.

Under the minimum conditions for continuous process activity, any employee required to work on his day off is entitled to double pay for the whole of that day. The attitude of the Council is that a shiftsman is entitled to one day off in his working week, but not necessarily the same day each week. This depends entirely on the exigencies of the service, and can be varied from week to week as the conditions of service demand. Provided an employee is given off one day in seven, it is considered that the Minister's conditions have been complied with. In certain branches of the Council's service, however, certain employees have considered this as a right to regard the same fixed day each week as their weekly day off, and this dispute has caused a certain amount of argument. The minimum conditions laid down by the Minister are by no means clear on this point, and it is considered that the matter should be rectified.

A further anomaly arising out of the Minister's conditions in declaring certain activities to be those in which continuous activity is required was introduced as the result of Wage Determination No. 105 for the Witwatersrand and Pretoria. (The same anomaly will apply for certain areas of the Cape as a result of the introduction of Determination No. 109.) Certain unskilled employees are covered both by the Determination and by the minimum conditions. Under the Factories Act those shiftsmen in continuous activity processes received time and a half for their Sunday shift of 8 hours, and were permitted to work a full period of 8 hours without a break of one hour after five hours' work. As a result of the Determination, however, they would now be required to be paid double pay for the Sunday shift, and required also to have a full hour's interval after the first five hours of their shift. A concrete example of this anomaly would be afforded by the case of a European shiftworker in charge of a gang of native labourers. The shiftworker, not being an unskilled labourer, would be entitled only to time and a half for his Sunday work, and would be deprived of the hour's interval for his lunch. The native labourers working under him would be entitled to double pay, and also to the hour's interval. This anomaly was brought to the attention of the Department of Labour, which gave the necessary exemption from the Wage Determination, with the result that these unskilled employees who are now covered both by the Determination and the Factories Act shall continue under the conditions laid down by the Minister under the Factories Act, as though conflicting provisions of the Determination had not been promulgated.

(12) The effect of Government Notice No. 1370 of the 26th September, 1941, is that managers and foremen who receive remuneration at a rate of not less than £540/0/0 per annum are exempt from the provisions of Paragraphs (c) and (d) of Sub-section (1), and Sub-sections (2), (3) and (4) of Section 19, and Section 20 of the Act. This meant in effect that foremen and managers could work overtime in excess of 10 hours per week, and were not entitled to any pay whatsoever for this period, not even at ordinary rates, let alone overtime or Sunday rates. The result was that in many branches of the service artisans junior to the foremen were earning in actual money from wages plus overtime, an amount considerably in excess of that received by the foremen. This led to requests from the foremen for an extra bonus, and they were awarded an amount of £6/10/0 per month in the Electricity Department. The new Man Power Regulations which became operative as from the 15th May, 1943, reduced the minimum working hours to 48, and the bonus was correspondingly reduced to £1/12/6. The anomaly still remains that artisans can earn more than foremen.

(13) Section 21 provides that every employee must receive his period of leave not later than two months after the termination of twelve months' employment. This section may be a very salutary provision in safeguarding the leave privileges of employees in concerns such as a clothing factory, for example, where no hardship is incurred if the factory closes down for a certain period, as most do at the end of the year, and the employees all take their leave at the same time. In the case of those branches of the Council's service, however, which are classed as factories, there can be no such question of any closing down for a period of two weeks, as the supply of essential services to the community must be continued, and any closing down would seriously jeopardise such services or seriously prejudice the interests of ratepayers.

If strict effect is to be given to Section 21, then it would mean within 14 months of the Act coming into force there would have to be a general exodus of all factory employees on leave.

The disastrous consequences of such a step have already been emphasised.

In respect of native employees some relief has been given by Government Notice No. 482 published in Government Gazette No. 3022 of the 20th March, 1942. Under this Notice certain native employees are allowed to accumulate leave for a maximum period of two years, which permits of a certain staggering of the leave periods, and thereby enables the smooth functioning of essential services to continue. There appears to be no valid reason why a distinction in this regard should be introduced as between European and native employees, and if the need is recognised to allow accumulation of leave for native employees, then at the very least in respect of essential services which the Council's "factories" are, the same principle should be introduced, and the Minister should make the necessary exemption under Section 54 of the Act. In this connection

it may be stressed that the Council's leave regulations are at least 50 per cent. more favourable than the privileges afforded by the Act, and that the introduction of staggering will in no way prejudice the employees concerned. In respect of this period of leave granted, the Council has, in addition, generous sick leave privileges, whereas the Act makes no provision for payment of sick leave.

Emphasis is laid on the fact that it is not the grant of leave which is criticised, but the absence of the right to stagger.

In respect of Section 22, it can safely be stated that large sections of employees covered by the Act have been previously covered by Industrial Agreements or Wage Determinations, whose conditions are, in many cases, more favourable, e.g. the Council's general rate for overtime payment is time and one half, as opposed to time and a third prescribed by the Act.

(14) Section 45, which provides that the provisions of the Act cannot be varied by agreement or waived, appears to have overlooked the case where it is essential in the interests of the employer and employees to come to some arrangement. For example, the case of the Johannesburg Water Works Mechanics' Union may be mentioned. In that case the employees were required to do a stand-by shift periodically consisting of 117 hours per month. As these employees are, for the duration of the stand-by shift, confined to the premises, they must, in terms of Section 19 (4) (b), be deemed to be working. This would constitute a contravention of Section 19 (2) (b) limiting hours of overtime to ten per week. An agreement was arrived at between the Council and the Union which received the Minister's blessing, and the Minister has undertaken to grant the necessary exemption from the strict provisions of the Act and to honour the agreement arrived at. In so doing the Minister will presumably act under Section 54, as this is the only exemption section in the Act, but reference to Section 54 shows that it specifies those sections of the Act from whose provisions the Minister may grant exemption, and Section 45 does not appear to fall within them. The Minister by his action in sanctioning the agreement presumably realises that there are circumstances when an execellent case can be made for granting exemption from Section 43, but the Act strictly debars him from doing so. It appears necessary, therefore, that Section 54 should be amended to include within its ambit Section 45 and if necessary Section 46. In this connection attention is drawn to the recent Report of the Judicial Commission of Enquiry into the Pretoria Municipal Riot of the 28th December, 1942, in which it was pointed out that the Minister acted illegally in undertaking to grant certain exemptions from the Wage Determination. To avoid a recurrence of any further illegalities on the part of the Minister, it is suggested that this amendment be attended to forthwith.

Fairly lengthy regulations have been published, and in certain cases various Heads of Departments have complained that these regulations have been promulgated without due regard to the technical requirements of the service concerned. It is suggested that conditions in the workshops have been in existence for many

years, and that certain of the new regulations are very impracticable. In such cases where individual municipalities consider that the regulations cannot be complied with, provision is made under Section 54 for exemption to be granted.

(15) In conclusion it may be stressed that the above memorandum has attempted to set out the anomalies which arise from these sections of the Act as a result of the experience of the municipality in putting the Act into application, and where necessary these sections have been dealt with seriatim in some detail. There remains, however, the general and oft repeated criticism by the municipality that, being a supplier of essential services and not competing in any private economic sphere, a local authority should not be submitted to demands which are not at the same time made binding and applicable on the Provincial or the Government Departments as well, e.g. the Railways and the Mines. During the last two years, for example, the City Engineer's Department and the Power Station have been engaged on essential war services, and, as such, have had to do the same work as certain Government Departments, but under more onerous conditions. In this connection, the following extract from the Pretoria Judicial Commission of Enquiry already referred to appears to be relevant. In paragraph 64 of this Report the Commission says, inter alia:—

> "The City Council occupies a position of considerable difficulty. Within its limited jurisdiction it must govern its affairs in a manner differing only in degree from the Union or Provincial Government, and it has duties towards its ratepayers as well as towards its employees . . . It was entitled, they think, to emphasise the apparent anomaly that local authorities should be subject to a wage determination which was not made applicable to native employees of precisely the same type in the service of the Union and Provincial Governments."

Mutatis mutandis, it is submitted that the same remarks should be seriously considered in relation to the Factories Act, by substituting the Act for the words "wage determination" where the latter occurs in the extract from the Judicial Commission's Report.

In addition to the above anomalies under the Act, the following further observations arise as a result of applying the Wage Determination to certain employees hitherto covered by the Act but now covered by both pieces of legislation.

It may be pointed out that an analogy Wage Determination No. 105 has recognised some of the anomalies mentioned, viz., in Clause 3 (2):—

(a) It is provided that where a daily employee is precluded from working, but has to stand by for a period not exceeding three hours, he receives a fixed sum of 2/6d. and not a full day's work. While this admittedly applies only to week-ends and not Sundays, and only to daily employees and not others, it nevertheless affords a certain amount of recognition of the principle sought for.

(b) In terms of Clause 8 (3) of the Determination Sunday work is prescribed for by means of dividing the work week by the number of working days, which also supports the principle contended for in this connection.

The difficulty will be best understood by the following example:—

(16) An unskilled employee works at the power station whose hours of work are Monday to Friday, inclusive, 8 hours 15 minutes, and on Saturday 4 hours 45 minutes. This employee is required to work for 1 hour on a Sunday. Under the Factories Act he is entitled to 16½ hours pay, while under the Determination he is entitled to either 15½ hours, under Clause 8 (3) (a), or to 1½ hours plus a holiday on full pay, which amounts to 7 hours 40 minutes, making a total of 9 hours under the Clause 8 (3) (b). Thus the Determination has recognised the principle which is missing in the Factories Act.

This gives rise to the very interesting anomaly that the Minister has, under Government Notice No. 2251, published in Government Gazette No. 3114 of the 6th November, 1942, declared that the provisions of the Determination No. 105 are no less favourable to employees affected thereby than the relative provisions of the Factories Act, whereas the above example shows that unskilled employees covered both by the Act and by the Determination, at least insofar as casual Sunday work is concerned, have far more favourable conditions under the Factories Act, although as a result of the Minister's declaration and in terms of Section 22 (1) of the Factories Act, the Determination and not the Act shall have legal effect.

(17) In passing it may be noted that the Factories Act makes no provision for paid sick leave at all, and a large number of skilled employees are deprived of this benefit. As opposed to this, the Determination makes provision for sick leave, and thereby gives unskilled employees a privilege denied to skilled employees.

The leave provisions of the Determination (see Clause 6 (2) (ii) (a) and (b) ) recognise the principle of staggering of leave sought for in the anomaly mentioned under the Act. An employee other than a factory employee can take his leave within a period of six months after it is due, whereas the factory employee must take it within two months. Here again the Determination, which, it must be stressed, has a ministerial declaration to the effect that it is no less favourable to employees than the relative provisions of the Act, gives recognition to the principle desired in the application of the Act.

In terms of Clause 6 (2) (5) those factory employees who are also covered by the Determination may accumulate their leave for two years with the employer's consent. As the Determination largely affects Non-European employees, this provision coincides very largely with that of Government Notice No. 482 of the 20th March, 1942, and affords further recognition for the principle sought for in respect of European and skilled employees under the Act.

**The President:** You will note from the Secretary's Report that

it is necessary to appoint your representatives to meet the Minister in conjunction with the Executive of the Municipal Association. Would you like the Executive Council to deal with this matter, or appoint delegates yourselves?

It was moved and seconded that it be left to the Executive. Agreed.

# S.A. Standards Institute

**(Report No. 1) By Mr. G. R. E. Wright.**

As your representative on the Main Committee of the S.A. Standards Institute I attended the meetings of the Institute which were held on the last Thursday of each month. That Institute considers standards of all types, not necessarily engineering, and during the period numerous standards were approved, mostly British Standards Specifications adopted for use in South Africa. Nothing of particular importance to the engineers of this Association was dealt with.

I might say that the Standards Institute was largely interested in the Standards Bill now before Parliament, but which at a later stage is to be superseded by the Scientific Research Bill, which will incorporate the Standards Bill and the latter will be subservient to it.

**The President:** We are all indebted to Mr. Wright for the hard work he has put in on our behalf. I think if you have anything to say in regard to standards, this is the time to ventilate your views. You will note with gratification the degree of success which has attended the work of this Institute, particularly as the Union Parliament has got to the stage of a Bill dealing with the matter.

**Councillor Ferry** (Cape Town): I am not too well acquainted with the pros and cons of this matter, but what I do know is this, that there is general dissatisfaction with the Bill from an engineering and metallurgical point of view, and this view has also been taken up by the Cape Chamber of Commerce and Industries and more particularly by the S.A. Federated Engineering and Metallurgical Association. Also that this Bill has met with considerable opposition, and certain members voted against the Bill.

However, as far as I understand, the average engineer or man who handles metals in the Union is wholly in support of standards where it affects health and safety. But I understand too that these standards will be generally supplied, and even if you are going to manufacture something of little or no scientific or engineering consequence you will have to submit, if called upon, a specific analysis of the metal, whatever it may be, which we consider is contrary to the successful industrial development of this country and will have the tendency to throw the industrial work of the Union into the hands of monoply. What we would like would be for the Minister to extend the option on demand.

The letter received by the S.A. Federated Engineering and Metallurgical Association on the 27th of this month clarified the point,

and I fear the Minister is not going to make any changes in the Bill. But I sincerely trust that the Standards Committee of this Association will study the Bill from time to time and see if there are any points in it which detrimentally affect the electrical engineer in particular and the engineering industry in general.

**Mr. Wright:** Provision is made in the Bill for Standards to be made compulsory, but I do not think any standard would be made compulsory without consultation and approval of all concerned. It is for the purchaser to state whether an article is to comply with a prescribed specification or not. There was a clause in the Bill to which manufacturers of certain proprietary lines took definite exception, and that was where the Inspector under the Bill had the right to demand to be furnished with all the processes of manufacture of a particular article, and I think that objection was reasonable. I think such a firm was entitled to protection.

**Councillor Ferry:** I agree that in this letter to which I referred, from the Association to the Minister, dated 23rd of last month, ample provision is made for the manufacturer of articles which are "non standard". I have referred to the letter from S.A.F.E.M.A. in which they could not agree, and on the 27th of the month the Minister replied saying he could not introduce any further safe-guarding measures, and trusted they would assist the Bill to take its course.

**The President:** Mr. Wright will correct me if I am wrong, but I believe the S.A. Standards Institute has not done anything that has not been done already, particularly in Great Britain, and it has been done with the blessing and support both of users and manufacturers. And it must be borne in mind that the standards envisaged in the Bill are minimum ones—not maximum. If we want to take this matter further, and if Mr. Ferry will indicate any lines on which he thinks this Association should discuss this matter further, he should put forward a motion which we could approve or reject. Otherwise we cannot carry the matter further now. Would you like to have further time?

**Councillor Ferry:** I should like it discussed later if possible. As far as I can gather, the average industrialist in the Union does not mind working to a specification. In fact he welcomes it. But only on a voluntary basis. In shipping, for instance, they will adopt the British Standards. But we have other countries which have nothing to do with those standards, and prefer or demand standards of their own. I think some consideration should be given to that.

**Councillor Baskerville** (Salisbury): I think that we can carry these standards too far; for instance, if we lay down standards these will be adopted, especially by the smaller municipalities as their specification, and as we cannot spare the time yearly to bring them up to date, these specifications will lag behind the latest developments, tenderers being unable to offer improvements for fear that an extra 5 per cent. or 10 per cent. will put them out of the running, so that these municipalities get what is not the best.

Manufacturers have their laboratories employed on continuous research so that it would be best for engineers to state their requirements and any particular circumstances that have to be met and leave to the tenderers to put forward the best they can offer, be it a transformer or any other article that they judge will meet the case.

**The President:** If you agree, we will hold over discussion on this Report.
Agreed.

# Asbestos Piping in Relation to Its Use for Electrical Earthing Purposes

**(Report No. 6) by Dr. Hamlin and Mr. Fraser.**

In order to give you a background as to how this question arose, we submit the following extract from the minutes of the meeting of the Advisory Council of the Association of Municipal Electricity Undertakings of South Africa and Rhodesia, held in the Board Room, Electricity Department, on Wednesday, 30th August, 1944, at 2.15 p.m.:

(iii) Desirability or otherwise of establishing a joint A.M.E.U. and Association Municipal and County Engineers Committee to report on asbestos piping for water mains. (Resolution No. 4).

The Chairman said we had circulated the letter from Mr. Smith, Acting Town Engineer, Boksburg, to the Executive Council for their views. The various replies received had already been forwarded to Mr. Smith by the Secretary. Mr. Kinsman had called attention to his paper at the 15th Convention on this matter.

After discussion it was agreed that we write to the Association of Municipal and County Engineers asking what they have done in this matter, and if nothing had been finalised, suggesting that we establish a joint sub-committee to report thereon. It was also agreed that those nominated to deal with item 4 (b) hereof be requested to deal also with this question and nominate a sub-committee if the joint committee was eventually established.

It was resolved:

"That it be a recommendation to the Council of the Association that consideration be given to the establishment of a committee comprising representatives from the Association of Municipal and County Engineers and this Association to investigate and report on the use of asbestos piping for water mains in relation to use of water for electrical earthing purposes."

Subsequently a joint sub-committee was formed of both Associations and the following report of that meeting which took place in Dr. Hamlin's offices on the 6th March, 1945, is submitted by Dr. Hamlin and J. C. Fraser.

Those present at the meeting were:
Dr. Hamlin, City Engineer, Johannesburg.

Mr. P. P. van der Merwe, Town Engineer, Brakpan, representing the Association of Municipal and County Engineers, with Mr. H. G. Till, Engineering Assistant, Water Branch, City Engineer's Department, Johannesburg, in attendance.

Mr. Smith, Acting Town Engineer, Boksburg.

Mr. G. R. E. Wright, Electrical Engineer, Benoni.

Mr. J. C. Fraser, General Manager, Electricity Department, Johannesburg.

Mr. L. L. Horrell, representing the Association of Municipal Electricity Undertakings of South Africa and Rhodesia.

A general discussion took place on the question of asbestos piping replacing cast iron or steel piping for water mains, and views were expressed that it would be very unlikely for asbestos piping to replace steel piping for water mains to any great extent. There would be cases, however, where the ground would be more suitable for asbestos piping, and in these cases, it was agreed that the Town Engineer should notify the Town Electrical Engineer of such installations. It would then be the Town Electrical Engineer's responsibility to adopt whatever earthing system he prefers.

Various methods of earthing consumers' installations were mentioned, such as the multiple earth neutral adopted by the Electricity Department, Cape Town, and the running of a separate earth wire along with the overhead low tension mains and providing a connection for the consumer, but were not discussed in detail and no decision was arrived at as it was felt that it was largely a matter for each Town Electrical Engineer to adopt whatever system he considered suitable to his own particular requirements.

**Mr. Fraser:** Members will recall that this question was brought forward by Mr. Smith, the Acting Town Engineer of Boksburg. I propose the adoption of the report.

**The President:** For the purpose of discussion I formally second that.

Agreed.

Are there any comments on the subject matter of this report?

**Mr. Eastman:** The view expressed that it would be very unlikely for asbestos piping to replace steel piping for water mains, at least to any great extent, does not hold good in the Cape Peninsula where the mountain-collected water not only contains salt in appreciable quantities, but also corrosive acids supplied by the vegetation on the mountain slopes. In Cape Town asbestos piping is being used in an ever increasing extent in replacing steel piping in the smaller sizes. Therefore in the Cape we are faced with the problem of devising suitable and safer earthing arrangements on a very big scale.

**Mr. Stevens:** I should like to ask Mr. Eastman if the Post Office authorities have commented on Cape Town adopting the multiple earthed neutral system, because it appears that special permission must be obtained from the Postal Department for earthing at more than one point.

**Mr. Eastman:** We have not experienced any difficulty whatever from the Postal Authorities.

**Mr. Stevens:** At Ladysmith we have multiple earthing of the neutral that has worked very satisfactorily and we have not had complaints from the Postal Department.

**Councillor Webb** (Benoni): I must confess that in listening to this report I cannot conceal a little dissatisfaction. In every town almost we find improvised earthing systems—here, there and everywhere—and I cannot help thinking that a recommendation from this Conference to every Municipality would be a good thing. That is to say, to introduce the same system as at Cape Town. They have a neutral wire throughout the town, and all earthing arrangements are connected with that system, and in this way the consumer is safeguarded. Why cannot that system apply to all householders as well? As regards the block arrangement there is no safeguard. We have had accidents on the Reef, so I maintain that a recommendation should emanate from this Convention and go to every Municipality —that is to say, a recommendation of some arrangement whereby the consumer is safeguarded: in other words, it shou'd not be left to each individual Council to do exactly as it likes in this matter.

**Mr. Powell:** I should like to associate myself with these remarks. We know that under the Wiring Regulations it definitely states what should be done where a satisfactory earth to the town main cannot be obtained. Owing to the shale formation in a place like Bloemfontein, you cannot drive a spike more than six inches below ground level, whereas at Cape Town I understand they can drive it in many feet. So I agree with the previous speaker. The present position is not satisfactory. Some places have adopted earth wires, others earth plates, pipes or rods, while others have adopted an earth neutral conductor on the poles along the road, etc.

**Mr. Eastman:** Mr. President and Gentlemen: A circular letter in the following terms was sent out in May, 1941, to all electric wiring contractors on this point:

# Earthing of Consumers' Installations

Owing to the fact that cement asbestos composition piping is now being used fairly extensively, in the Department's area of supply, for water mains, the electrical continuity of the water reticulation system is being broken up and connection thereto can no longer be universally relied upon as an adequate means of earthing consumers' installations.

In order to meet the situation which has now arisen the Department proposes to declare its supply system permanently and effectively connected to earth in terms of paragraph 112 of the Institution of Electrical Engineers Regulations for the electrical equipment of buildings (11th edition) and to introduce the system of earthing known as "Multiple Earthed Neutral".

In this system the non current carrying parts of the consumers installation are bonded together in the usual way and connected by means of an earthing conductor to the best earth available on the

consumers' premises which in the local case may be the water system or, in areas where the value of this as an effective earth is doubtful, a driven spike or spikes. In addition, whatever system of direct earthing is adopted will be backed up by the connection of the earthing system in the consumers' premises to the supply neutral by the Council.

To give effect to these proposals the following requirements must be met by electrical wiring contractors carrying out new installations or making alterations to existing work.

(1) Conduit and all other non-current carrying metal parts of the electrical installation beyond the consumers' main switch shall be bonded in the usual way to the main switch controlling the supply except that the minimum size of bond used shall be or be equivalent to a doubled No. 14 s.w.g. copper wire. From the main or cooker switch and the conduit of the internal service connection separate bonds will be provided and fixed by the Council to the earthing system specified below. The electrical wiring contractor will be required, however, to provide and fix the necessary approved earthing clip at the termination of the interval service conduit.

(2) The main earthing conductor shall be an insulated stranded wire run in screwed conduit from a position adjacent to the internal end of the lead-in conduit to the position where the direct earth on the consumer's premises is located. This main earthing conductor shall, in general, have a cross sectional area equal to 50 per cent. of the cross sectional area of the phase conductor of the internal service connection, subject to a maximum of 0.1 square inch and a minimum of 0.007 square inch (7/.036 inches). The ends of the conduit in which this conductor is run shall be bushed with brass or steel bushes and shall itself be earthed by bonding to the conduit of the internal service connection.

(3) The direct earth on the consumers' premises in areas where the value of the water system as an effective earth in the opinion of the Council is doubtful, shall consist of one or more driven earthing spikes. In other areas an approved connection to the water supply system will be accepted as the consumers' direct earth.

(4) Where, in terms of (3) above, driven earthing spikes are required to obtain an effective consumers' direct earth, such spikes shall consist of 12 to 14 ft. lengths of 1 inch gas galvanised piping pointed and carefully driven to within 1 foot of their full length, in a convenient location, as near as possible to an outside wall of the premises.

(5) The maximum acceptable earth resistance of the direct earth obtained by driven spikes shall, in general be 44 ohms, but in the case of blocks of more than 6 flats, or installations, the effective loads of which are in excess of 50 amps per phase, the maximum acceptable earth resistance so obtained shall be 22 ohms. If an earth resistance of acceptable value is not obtainable by the driving of a single spike to the required depth, additional spikes must be driven and together with the first connected in parallel until an acceptable total

earth resistance is obtainable. The test for compliance with this requirement will be by blowing a fuse of relevant size on dead grounding one phase of the supply system to the earthing system through such fuse. When more than one driven spike is required to comply with the overall resistance requirements set out above a minimum distance of 5 ft. must be kept between adjacent spikes.

(6) Where an artificial earth has been provided in terms of (3) above the water supply system shall be connected to the earthing system. This shall be effected by running an insulated stranded bonding conductor of the same section as the main earthing conductor in screwed conduit from the meter board to the nearest water pipe. The connection to the water piping shall under no circumstances be made by looping in on the main earthing conductor between the meter board and the ground spike.

(7) At the location of the earth connection the earthing conductor shall be connected to the spike or water pipe by means of an approved earth clip and ample slack shall be left in the conductor and spiralled at this position.

(8) Where outbuildings are wired and fed by overhead conductors the non-current carrying metal parts of the installation in such outbiuldings shall be bonded to the conduit in the main building by means of an additional overhead conductor which, in general, shall have a cross sectional area one half of that of the phase conductor of the overhead line but shall under no circumstances be less than a No. 10 s.w.g. In addition to the bond provided by this conductor of the non-current carrying parts of the installation in the outbiulding/s shall be locally earthed to a earth spike or spikes by means of an insulated earth conductor in screwed conduit in similar manner to the main earth, to give a maximum local overall earth resistance of 44 ohms.

(9) Where a premises takes supply at more than one tariff rate there shall be no deliberate inter-connection of the non-current carrying metal parts of the portion of the installation supplied at one tariff rate with the non-current carrying metal parts of the portion supplied at any other tariff rate, on the load side of the consumers' main switches.

(10) The Council will provide a multihole connection block in place of the present neutral link and will connect to this the supply neutral, the main bond from the cooker switch or main switch, the insulated bond from the internal service conduit, the main earthing lead to the consumers' earth and the insulated bond to the water piping.

(11) No fuse or unlinked switch shall be inserted in any conductor which is connected to the supply neutral. This will involve the use of distribution fusegear fused on the live pole or poles only with a multihole connection bar for the neutral.

(12) Cooker switches shall be provided with 3 fuses for the range, 6 subsidiary single pole fuses for 6 sub-distribution circuits and the neutral link shall be provided with 7 outlets. The case shall have 1 hole in the lower wall tapped ¾ inch gas for incoming supply and on

the upper wall one hole tapped ¾ inch gas for the range circuit and six holes tapped ½ inch gas for subsidiary circuits.

(13) Main switches for installations supplied on the two wire system shall consist of ironclad double pole switches fused on the live pole only..

The general arrangement required is shown diagramatically for domestic residences and single tariff rate installations on the attached sketch S.F. 1017.

Blocks of flats and multi-rate installations will follow the same general lines, the details of the respective arrangements being shown on the attached sketches S.F. 1018 and S.F. 1025.

The Council's requirements, as set out above, will be brought into force on 1st September, 1941.

Attached: Sketches S.F. 1017, S.F. 1018, and S.F. 1025.

In Cape Town difficulty is sometimes found in persuading consumers to comply with the requirements, as a safety measure, but ultimately we have generally managed to convince them of the need for doing so.

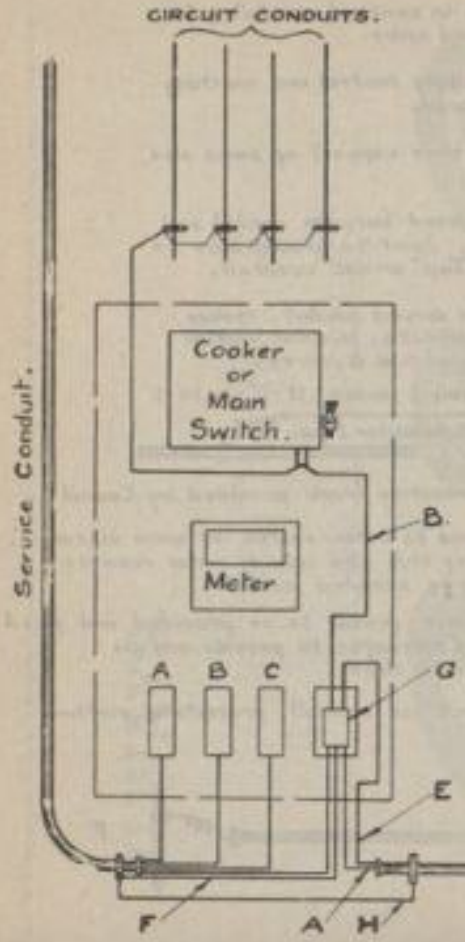
**Mr. Powell:** I have mentioned our particular difficulty. It seems to me that if you are going to have a standard form it will have to take the shape of an overhead earth wire or multiple earth neutral conductor.

**Mr. Gregor** (Standerton): I think it essential that a recommendation should come from this Association regarding earthing. The Executive should go into this with the various departments and bodies concerned to evolve a system to be used, which is not only efficient but which is safe.

**Mr. Wright:** I am afraid we are in a sense blaming the members of the sub-committee for something they were never asked to do. This sub-committee, I would remind you, was appointed on the application of the Town Engineer of Boksburg, who enquired if there was any earthing procedure laid down when a steel water main was replaced by an asbestos main, and could we give him an idea as to the best procedure to adopt in order to overcome the difficulty of earthing the consumers' installation thereafter. This sub-committee went into that question—not from the point of view of substituting an entire reticulation system of steel mains by asbestos mains, but for the replacement of certain corroded sections of steel mains or cast iron mains which required replacement and which were being replaced by asbestos mains, and it was suggested that there were a number of methods whereby this breaking of the earth continuity through the water mains could be made good. But for us to say which of those each particular engineer should adopt would be going rather too far. That, I think, was the main object of that sub-committee meeting: it was not, in other words, to draw up a safety code for earthing in general.

**Mr. Fraser:** I should like to support the remarks of Mr. Wright. The points we are concerned with is that provision for earthing is

## GROUNDING SYSTEM FOR SINGLE TARIFF RATE INSTALLATION.




A. Insulated ground wire in screwed conduit from meter board to ground spike.

B. Insulated bond of same size as "A" provided and fixed by the Council.

C. Bare copper bond between conduit and cooker or main switch. Minimum section equivalent to two No. 14 S.W.G. wires.

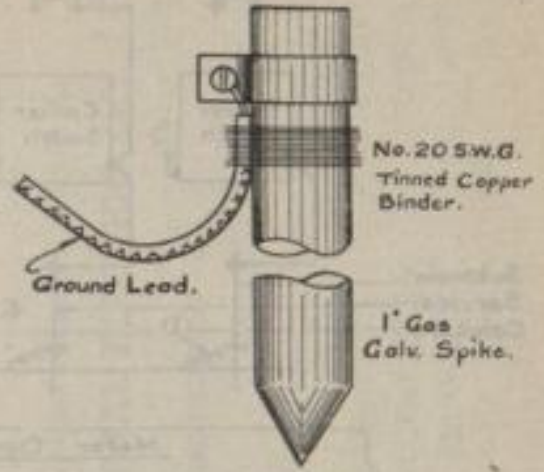
D. Ground spike or spikes (1" gas galv.) driven to depth of 12'0" to 14'0".

E. Insulated bond of same size as "A" between meter board and water piping.

F. Bond between internal service conduit and earthing system to be provided and fixed by the Council. Electrical Contractor to provide and fix necessary earth clip.

G. Multihole connection block provided by Council.

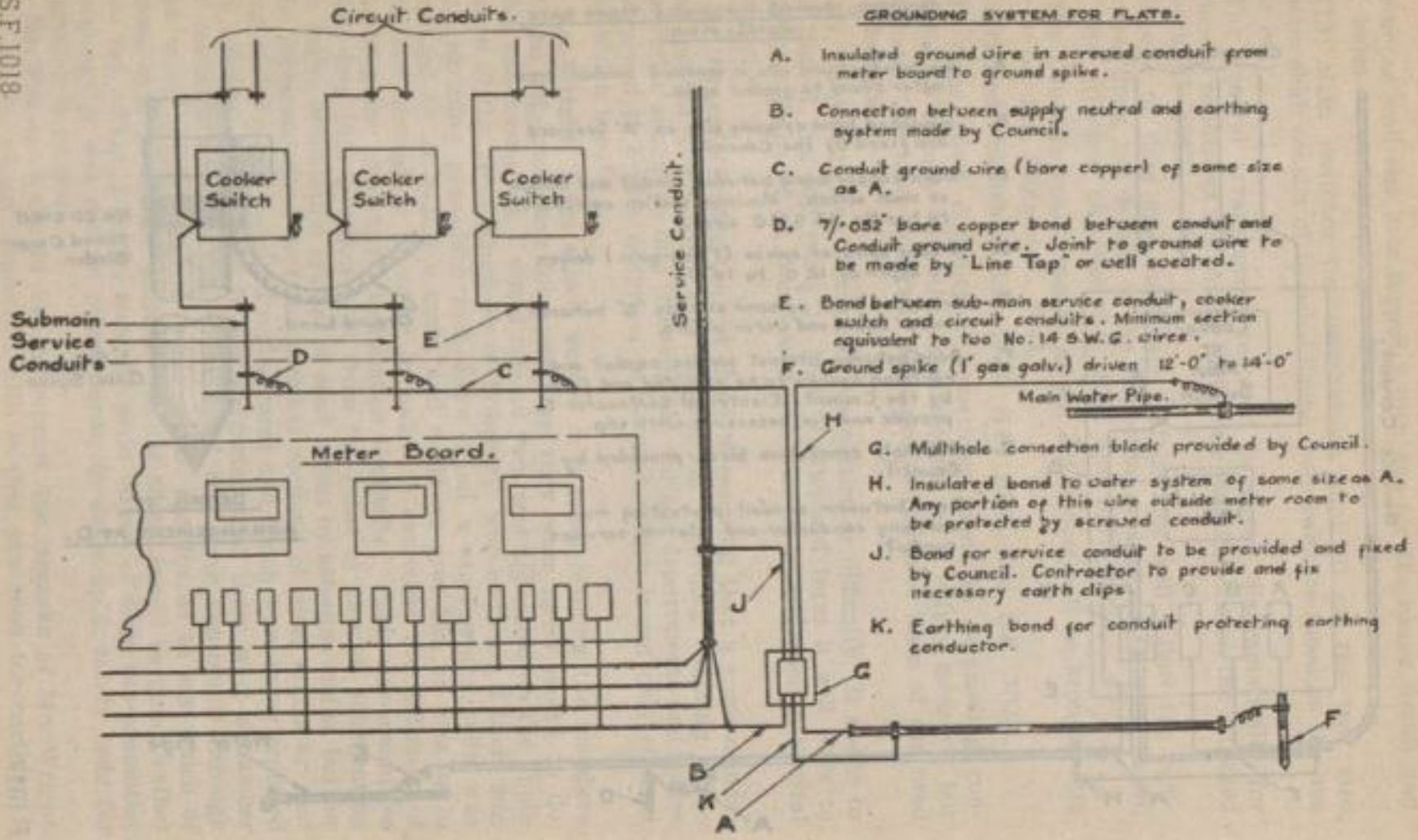
H. Bond between conduit protecting main earthing conductor and internal services conduit.




DETAIL OF ARRANGEMENT AT D.

47

S.F.1017




## GROUNDING SYSTEM FOR FLATS.

A. Insulated ground wire in screwed conduit from meter board to ground spike.

B. Connection between supply neutral and earthing system made by Council.

C. Conduit ground wire (bare copper) of same size as A.

D. 7/·052" bare copper bond between conduit and Conduit ground wire. Joint to ground wire to be made by "Line Tap" or well soldered.

E. Bond between sub-main service conduit, cooker switch and circuit conduits. Minimum section equivalent to two No. 14 S.W.G. wires.

F. Ground spike (1" gas galv.) driven 12'-0" to 14'-0"

G. Multihole connection block provided by Council.

H. Insulated bond to water system of same size as A. Any portion of this wire outside meter room to be protected by screwed conduit.

J. Bond for service conduit to be provided and fixed by Council. Contractor to provide and fix necessary earth clips

K. Earthing bond for conduit protecting earthing conductor.

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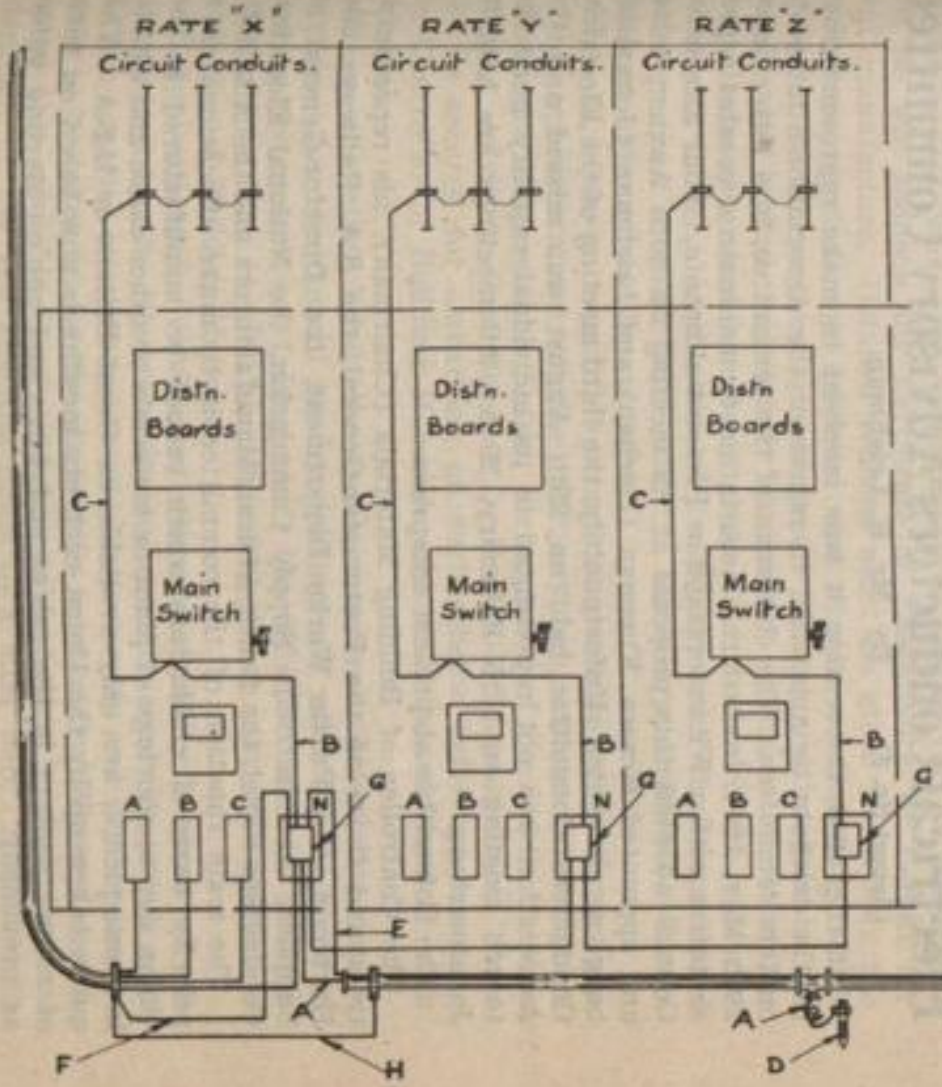
**THE CHLORIDE ELECTRICAL STORAGE CO. (S.A.) (PTY.) LTD.**

**P.O. Box 7508, Johannesburg.**




## GROUNDING SYSTEM FOR MULTI-TARIFF RATE INSTALLATION.

A. Insulated ground wire in screwed conduit from meter board to ground spike.

B. Insulated bond of same size as A, provided and fixed by Council.

C. Bare copper bond between conduits and main switch. Minimum section equivalent to two No. 14 S.W.G. wires. This bonding to be kept separate for separate rates.

D. Ground Spike or spikes (1" gas galv.) driven to depth of 12'-0" or 14'-0"

E. Insulated bond of same size as A, between meter board and water piping.

F. Bond between internal service conduit and earthing system provided and fixed by Council. Electrical Contractor to provide and fix necessary earth clip to end of internal service conduit.

G. Multihole connection block provided by Council.

H. Bond between conduit protecting main earthing conductor and internal service conduit.



S.F.1025

covered adequately in the standard regulations for the wiring of premises, and it is the consumer's own responsibility to see that his installation is efficiently earthed. I do not think for one moment that any specific system that we, as an Association, could recommend would meet the requirements of every Municipality. There are advantages and disadvantages to all systems, and I can only suggest that it should be the function of the Electrical Engineer in each particular Municipality to say which form of earthing would suit his purpose best.

**The President:** This ad hoc committee has no doubt done its job, but if you want it to do another job there is no reason why you should not frame a suitable resolution or why you should not be specific in regard to its terms of reference.

TEA INTERVAL

**On resuming:**

**The President:** Gentlemen: I should like you to continue the discussion on this Report, No. 6—"Earthing". We can postpone discussion to a later stage if you so desire.

**Councillor Pritchard:** I move, accordingly, that it be deferred.

Agreed.

# Electrical Conductors Advisory Committee

**(Report No. 8)** **By Mr. R. Leishman.**

At the 1944 Convention it was resolved to make representations that a delegate be appointed to represent the Association's interests on this committee. The chairman of the committee, in a letter dated 29th May, 1944, invited the Association to nominate a coastal representative with a Witwatersrand or Pretoria alternate. Your Executive Council adopted this proposal at its meeting on 30th August, 1944, and appointed Messrs. Kinsman (Durban) and Leishman (Johannesburg) as alternates. Unfortunately, the third meeting of the Electrical Conductors Committee held on 25th August was missed and the Association was not represented in its individual capacity until the fourth meeting on 12th February, 1945. All meetings are held in Johannesburg.

The Committee at present comprises:

The Controller of Building Materials (Chairman), his representatives and those of the Postmaster-General, the S.A. Railways and Harbours, the Public Works Department, the Director-General of Supplies, the Electricity Supply Commission, the National Electrical Conductors Panel, the South African Manufacturers and the A.M.E.U.

The main function of the committee is to make allocations on a priority basis of conductors which cannot be manufactured in the Union due to shortage of plant or materials or other cause and which, in consequence, are only available ex Great Britain or U.S.A. The quota taken up by the Union each six months is now based on tons of copper content in the cables and wires and not on sterling value as previously.

For the general information of members, the following classes of cables and wires are roughly those which materials and production programming have permitted to be manufactured locally in later war years and on which import control had been particularly stringent:

(a) Paper-insulated power cables up to and including 12,500 volt having a number and cross-section of cores such that the overall cable diameter over the lead sheath does not exceed 3 inches.

(b) Vulcanised rubber-insulated cables, wires and flexibles of nearly all grades and types (.018 inches being the smallest locally manufactured strand) having a maximum overall diameter of 2½ inches for T.R.S. and 3 inches over sheath for lead covered.

(c) Certain rubber or paper-insulated pilot and telephone cables.

(d) A.M.E. wires up to 6 s.w.g. solid and 19/.044 inches stranded.

(e) All usual sizes of bare copper conductors from 0000 down to 26 s.w.g. solid, 37/.116 inches down to 3/.104 inches stranded and grooved trolley wires up to 0000 s.w.g. max. There has been a great shortage of finer wire than 26 s.w.g. which has to be imported.

N.B.—This list does not cover the whole range of conductors which could be, or in the past already have been, made in the Union during more normal times.

Whether conductors are to be purchased ex local manufacture or ex import it is essential to make application to the Controller of Buildings, P.O. Box 7795, Johannesburg, asking for his assurance that he will sponsor any Certificate of Essentiality, or Permit for local manufacture. Detailed reasons must be given as to why the conductors required are essential and of the consequences which would follow unless they are obtained. This should be done before tenders are invited and tender documents should state that the Controller's assurance has been given as contractors are othrwise unlikely to tender. At the time of placing the order on the successful tenderer, the Controller will issue the necessary certificate without which an order cannot be executed.

There is, however, a qualifying condition precedent to this procedure. If the conductors are required for any one scheme involving an expenditure of more than £1,000, the approval of the Public Utilities Building Advisory Committee, P.O. Box 1049, Johannesburg, must first be secured for embarking on such scheme before approaching the Controller of Building Materials who must be informed of such approval.

If, on the other hand, the conductors are required for "stock purposes" for the normal sundry jobbing and maintenance work in running the system not falling under the definition of "new schemes costing more than £1,000", then direct approach may be made to the Controller of Building Materials.

All applications for conductors whose essentiality is approved are co-ordinated by the Electrical Conductors Advisory Committee with (1) the capacity to manufacture the items locally and (2) the import quota to be taken up for the six months in question. Where demands exceed this available supply it becomes necessary to postpone consideration of the less essential items to a later date. It should be

understood that even when the finally approved schedules of conductors for import are sent overseas they still have to secure raw materials and export licences at the manufacturing end. While conditions have been very difficult up to the present in securing such licences, the latest information received from British manufacturers indicates a present tendency for a considerable easing of the position in securing the necessary licences for items which are covered by Ceritficates of Essentiality. Such a condition seems to be aimed at rehabilitating Britain's export trade.

The position in the Union today is very serious due to exhaustion of stocks of electrical conductors and very heavy calls on local manufacturing resources. Control measures are therefore necessarily strict but the Advisory Committee is taking definite steps in the effort to ease the position.

Members will therefore appreciate not only the necessity of meticulously following the channels provided for the pre-tendering stage if delays are to be avoided but also for securing sponsorship of essential needs well in advance.

For items which are of the highest urgency, a sub-committee of the Advisory Committee has been set up to deal with such items as soon as received. This sub-committee has been empowered to issue Certificates of Essentiality forthwith where it concurs that immediate importation is of prime importance.

**Mr. Leishman,** (Johannesburg): Before formally moving the adoption of the report I would appreciate it, Mr. President, if the meeting could first hear of certain changes of circumstances which, I understand, have arisen since this report was compiled.

**The President:** Before I ask the meeting to approve of this report, I feel sure you would like to hear something from one of the representatives of cable firms present. I understand he has some information which will assist us in regard to some of the remarks recorded in this Report.

**Mr. Russell** (Johannesburg): Mr. President and Gentlemen: May I say in the first place that I am speaking without any special authority, but as one who has been in close contact with the control of electrical conductors since that control came in. In connection with the first paragraph on page 2, and the point which Mr. Leishman mentioned, I may say that during the last two or three years there has been an agreement between all importing cable firms, that they would not refer any enquiry for cable to their principals or submit any tenders locally unless that enquiry definitely contained the assurance of a Certificate of Essentiality. That position is now changed. We consider the necessity for that has now passed, and on general requests from manufacturers in England, we are again proposing to quote against available enquiries. Our intention to do so, I may add, has been referred to the authorities in England, who welcome it, and the Controller of Building Materials has been advised accordingly, and he has raised no objection to our cancelling the previous arrangement.

**Mr. Leishman:** I move the adoption of the report. Agreed.

# Electricity Generating and Distribution Advisory Committee

(Report No. 9) By Mr. H. A. Eastman.

Subsequent to the last Convention the Association received the following communication, dated the 19th June, 1944, from the Controller of Building Materials:

"It has been decided to establish a Committee advisory to the Director-General of Supplies Organisation with the following functions:

(1) To co-ordinate the Union's war-time requirements of electricity generating and distribution plant and equipment.

(2) To prepare the ground for the proper co-ordination of the Union's post-war requirements of heavy electrical plant.

The Committee will consist of:

(a) The Controller of Building Materials (Chairman).
(b) The Assistant Controller of Iron and Steel (Industrial Machinery and Equipment), Mr. V. Bright.
(c) Mr. P. Furness, Electricity Supply Commission. (Alternate Mr. E. T. Price).
(d) Representative of the Municipal and Public Utilities Building Advisory Committee (with alternate).
(e) Representative of the Association of Municipal Electrical Undertakings (with alternate).

I should be pleased to receive the approval of your Association to the appointment of the representative and alternate mentioned in (e) above, together with the names and addresses of its nominees.

For the consideration of your Association it is suggested that it may be thought desirable to nominate a representative from a coastal town, with a Transvaal alternate, in this way it can be assured that the coastal viewpoint is adequately represented, while the Transvaal alternate, who would attend most of the meetings, would also be in a position to ensure that the interests of the inland centres are not overlooked.

As most meetings will be called at short notice, either the representative or the alternate should, if possible, be resident in Johannesburg and should be able to afford the necessary time to attend whenever called upon."

The Executive Council of the Association decided to accept the invitation and, in accordance with the wish expressed by the Controller in the penultimate paragraph, nominated Mr. H. A. Eastman (Cape Town) as the Association's representative with Mr. D. J. Hugo (Pretoria) as alternate.

## ARRANGEMENTS IN THE UNITED KINGDOM FOR THE AUTHORISATION OF MANUFACTURE OF HEAVY ELECTRICAL PLANT.

In order to enable members to appreciate the duties and functions of this Committee it would be as well to place on record, for the information of members, the arrangements which now exist in the

United Kingdom for the authorisation of manufacture of heavy electrical plant.

A Civilian Goods (Supplies) Committee (called the Portal Committee) has been established and deals with all requirements, particularly of capital goods, that are of a civilian nature as distinct from war weapons.

The Portal Committee does not handle individual applications but deals solely with the release from time to time of large blocks of manufacturing capacity. There is no combined export planning of heavy electrical plant for civilian needs with the United States of America and the Portal Committee accordingly deals only with the output of the United Kingdom and does not refer to the Combined Production and Resources Board in Washington.

Application for generating plant for overseas countries, having been presented to the Board of Trade by the country's High Commissioner, the Board of Trade pass them to the Heavy Electrical Plant Committee. This Committee (called the Tom Smith Committee to distinguish it from the defunct Kennedy Heavy Electrical Plant Committee) consists of 19 members representing the Ministries of Fuel and Power, Labour, Supply and Production, the Scottish Office, the principal turbine and boiler manufacturers.

Having received from the Board of Trade the application for plant, the Heavy Electrical Plant Committee determines how many of them the available capacity of the industry can deal with, and arranges them in order of priority. The Committee then passes the list to the Allocation Committee. This is the B.E.A.M.A. Committee and consists of the seven biggest turbine manufacturers. The Allocation Committee allocates each generating set to the manufacturer preferred by the purchaser provided that he has the capacity to complete in the time specified by the purchaser. The Allocation Committee send their recommendations to the Heavy Electrical Plant Committee who approve and tell the Board of Trade to authorise manufacture up to the amount released by the Portal Committee.

It is not intended under the procedure now prescribed by the British Authorities that overseas purchasers should be prevented from seeking competitive tenders. The British authorities point out, however, that purchasers who adopt the procedure of inviting tenders that, owing to the additional time evolved, find themselves at a slight disadvantage in delivery compared with those who negotiate orders directly. Whether, however, prospective purchasers decide to proceed by tender or not, it is most desirable, in their own interests, that the Heavy Electrical Plant Committee should have knowledge of the purchaser's order of preference among a number of manufacturers rather than that a single maker should be specified; the committee would then consider whether the maker chosen as first preference would be in a position to deliver the plant approximately by the date required and, if not, what delay must be expected. In the latter case the Committee might be in a position to name a maker who could deliver earlier; the prospective purchaser could then make his choice. In cases where the purchaser did not wish to call for tenders or to specify a maker the Committee would nominate a suitable maker.

One of the main difficulties with which municipalities are faced is in connection with the necessity for calling for competitive tenders, particularly in view of the present greatly increased cost of equipment of this nature. The Chairman of the Committee has frequently been requested to advise on this aspect and has found it difficult to do so in view of the varying circumstances surrounding each case and of the doubt which exists whether really competitive tenders are obtainable under present day conditions.

The matter is being further explored and the Chairman has addressed a Minute to the South African High Commissioner in London to obtain further information with a view to establishing the circumstances under which it is advisable to dispense with normal tender procedure, and whether any really competitive tenders are available under prevailing conditions. If no real competition exists the High Commissioner has been requested to ascertain whether any measures have been taken to ensure reasonable prices.

**Mr. Eastman:** I might explain in connection with one point mentioned in the report that the alternate has all the functions of the representative at the meetings of the committee referred to.

**The President:** We are indebted to Messrs. Eastman and Hugo for their efforts on our behalf. From the report read you can gauge the work which has been done.

**Mr. Eastman:** I thank you, and propose the adoption and noting of the report.

Seconded by Mr. Bradley. Agreed.

The Convention adjourned until 9 a.m. on Wednesday, 16th May, 1945.

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## WEDNESDAY, 16th MAY, 1945

The Convention resumed at 9 a.m.

**The President:** Gentlemen: Under Item 1 it was decided by the Committee which dealt with Report No. 7—Page 3 of your Programme —that we should continue the work during the coming year, and that Mr. J. C. Fraser should be the representative and the alternate would be Mr. Muller of Krugersdorp, who is unfortunately not here today. But I am certain he will undertake it. Then in regard to No. 8, the Executive decided that Mr. Kinsman should carry on the work of the Electricity Conductors Advisory Committee, with Mr. Leishman as alternate. In regard to No. 9 ,it was decided that Messrs. Eastman and Hugo should be your representatives on that committee for the coming year. Those from 10 to 14 inclusive were not appointed, because we felt that the decisions should be left over until the reports had been dealt with in Conference.

Then you will note that Item 2 set out for to-day covers the reports left over from the previous day. We felt that before we took these reports the paper under Item 4 should be read, and after that there should be discussion. If there is time this morning, these reports will be dealt with; otherwise they will be carried forward to Thursday or Friday. Do you agree to these proposals?

Agreed

# Development of Salisbury Municipal Electricity Undertaking

By J. S. CLINTON, *City Electrical Engineer, Salisbury.*

## 1.00—SUMMARY.

The paper covers the progress of the undertaking, principally over the past ten years, and outlines the line of development on which it has been planned. The economic area is determined, and thereafter the layout of the 33 kv. network fixed.

The standards of construction adopted for the distribution system, after considerable experimentation, are recorded, together with consumers' maximum loads and consumptions. Methods of maintenance and the development of two-way carrier and radio telephony for communication work are explained. Voltage regulation is discussed.

The main features of the generating plant have been set out, in particular, with reference to the steam storage installation and its operating characteristics.

Staff and industrial relations, and the question of increasing the output per manhour, form the final subject of the paper.

## 2.00—THE ECONOMIC AREA OF SUPPLY

2.10 **Physical Controls.** Salisbury, the capital city of Southern Rhodesia, is located in the centre of a fertile agricultural district. The extent of farming operations can be gauged from Table No. 1, (See opposite page) summarising the main crops by districts.

Mining of gold and other minerals forms part of the economy of the area. Its measure is set out in Table No. 2. Although gold mining has declined, due to the curtailment of operations over the period of the war, it is anticipated some recovery will be achieved. It is not, however, believed mining will ultimately form a large proportion of the area's economy.

TABLE No. 2

ANNUAL MINING OUTPUTS AND VALUES FOR THE SALISBURY MAGISTERIAL DISTRICT

| Year | Gold oz. | Value |
|---|---|---|
| 1938 | 104,430 | £878,000 |
| 1939 | 104,144 | 857,000 |
| 1940 | 104,066 | 874,500 |
| 1941 | 98,694 | 828,000 |
| 1942 | 93,113 | 782,000 |
| 1943 | 72,413 | 608,000 |

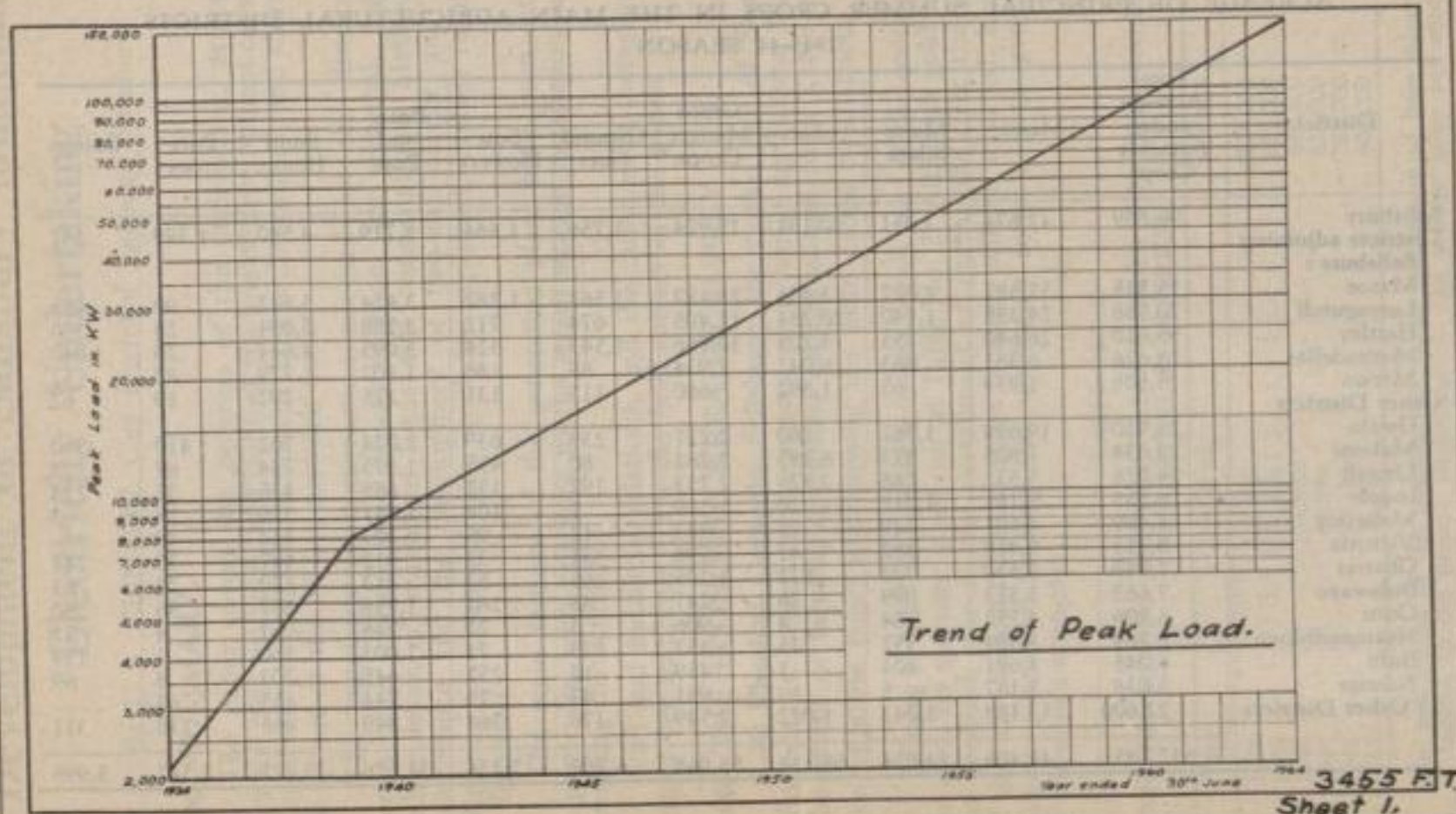
The publication of the outputs and values per annum of base minerals is banned in the present circumstances. The average value per annum might approximate £100,000.

TABLE No. 1

ACREAGE OF PRINCIPAL SUMMER CROPS IN THE MAIN AGRICULTURAL DISTRICTS

1943-44 SEASON

| District | Total Acreage under Summer Crops | Maize | Maize Silage | Tobacco | Green Manure Crops | Ground Nuts | Sun Flowers | Bean and Peas | Sunn Hemp | Potatoes | Cotton |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Salisbury ... | 96,889 | 42,674 | 3,051 | 10,131 | 19,924 | 1,756 | 1,884 | 8,719 | 4,540 | 1,399 | 232 |
| **Districts adjoining Salisbury:** | | | | | | | | | | | |
| Mazoe ... | 115,535 | 57,597 | 1,027 | 13,436 | 28,187 | 1,562 | 1,282 | 3,824 | 5,842 | 90 | 688 |
| Lomagundi ... | 70,758 | 24,395 | 1,140 | 20,284 | 12,495 | 674 | 712 | 3,288 | 5,094 | 23 | 373 |
| Hartley ... | 55,610 | 26,640 | 755 | 3,205 | 10,966 | 1,543 | 524 | 3,095 | 4,644 | 26 | 3,040 |
| Marandellas ... | 18,626 | 6,385 | 663 | 6,042 | 1,934 | 89 | 188 | 1,802 | 779 | 82 | 52 |
| Mrewa ... | 5,508 | 1,939 | 65 | 1,892 | 660 | 113 | 131 | 125 | 297 | 19 | 62 |
| **Other Districts** | | | | | | | | | | | |
| Gwelo ... | 28,920 | 19,694 | 1,762 | 160 | 2,227 | 239 | 639 | 2,074 | 702 | 410 | 380 |
| Makoni ... | 23,034 | 7,805 | 873 | 8,195 | 2,282 | 80 | 455 | 1,975 | 744 | 67 | 73 |
| Umtali ... | 14,628 | 5,531 | 288 | 3,826 | 2,253 | 192 | 132 | 688 | 436 | 32 | 223 |
| Insiza ... | 8,555 | 5,151 | 1,012 | 20 | 109 | 7 | 108 | 1,311 | 376 | 28 | 3 |
| Melsetter ... | 8,499 | 4,501 | 249 | 77 | 383 | 12 | 95 | 203 | 144 | 49 | — |
| Victoria ... | 8,353 | 5,419 | 382 | 47 | 798 | 31 | 33 | 912 | 447 | 35 | 144 |
| Charter ... | 7,949 | 4,530 | 302 | 821 | 1,205 | 65 | 53 | 413 | 270 | 22 | 63 |
| Bulawayo ... | 7,663 | 3,373 | 999 | 26 | 247 | 46 | 261 | 1,758 | 357 | 36 | 80 |
| Gutu ... | 6,806 | 4,752 | 84 | 4 | 906 | 3 | 21 | 248 | 67 | 4 | 51 |
| Nyamandhlovu | 6,769 | 3,994 | 552 | 25 | 453 | 123 | 71 | 1,003 | 160 | 1 | 154 |
| Bubi ... | 6,045 | 3,691 | 404 | 1 | 459 | 12 | 252 | 645 | 203 | 8 | 69 |
| Ndanga ... | 5,038 | 3,187 | 5 | — | 931 | 43 | 25 | 144 | 155 | 63 | — |
| **13 Other Districts** | 22,600 | 13,148 | 1,041 | 1,022 | 2,549 | 170 | 368 | 2,449 | 465 | 118 | 311 |
| | 517,785 | 244,406 | 14,654 | 69,214 | 88,968 | 6,760 | 7,234 | 34,676 | 25,722 | 2,512 | 5,998 |

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Sheet 1.

The Electricity Undertaking was commenced in 1913. The feature of the concern is its high rate of growth. Sheet 1 shows the annual maximum demand upon the undertaking from 1934 onwards. Table No. 3 gives the rate of increase per annum for the pre-war years; the average was 29.6% per annum. Since then it has averaged 12.1%.

TABLE No. 3

ANNUAL MAXIMUM DEMANDS AND PERCENTAGE INCREASES THEREOF

| Year | Maximum demands in kilowatts | Percentage increase over previous year |
|---|---|---|
| 1933/34 | 1,720 | 26.5 |
| 1934/35 | 2,700 | 24.1 |
| 1935/36 | 3,900 | 44.5 |
| 1936/37 | 4,650 | 19.2 |
| 1937/38 | 6,200 | 33.3 |
| 1938/39 | 8,050 | 29.9 |
| 1939/40 | 9,200 | 14.3 |
| 1940/41 | 10,600 | 15.2 |
| 1941/42 | 12,000 | 13.2 |
| 1942/43 | 13,300 | 10.8 |
| 1943/44 | 14,200 | 6.8 |

The maximum demands represent the figure in each financial year (as distinct from the calendar year) ending 30th June. A more true indication would be the figure for each calendar year, for the winter peak takes place in July of each year. Moreover, annual load factors based upon the financial year are similarly misleading.

When about 1934 the City Council was asked to entertain giving a supply of electricity outside the urban boundaries, it became apparent some decision would eventually have to be taken in regard to the economic limits of supply. At that time no national controlling body was in existence. The initiative had, therefore, to be taken by the local authority. For a time, each application for an extension was treated on its merits and the conditions determined accordingly. The right to extend electrical supplies beyond the civic boundaries depended upon a permissive clause in a Municipal ordinance originally designed to permit the serving of the Prince Edward Dam pumping station some twelve miles from the City.

Working to such a system, the proper layout of a rural network would have become impossible. It was apparent something more logical was necessary if an orderly development of the area and undertaking, with a minimum of waste, was to be achieved. Planning of the network had to begin by determining the extent to which a supply was justified on economic grounds. Thereafter, the question of a subsidy or a capital contribution from the consumer had to be considered for extensions beyond the economic limits of supply. The designed network pre-supposed the right of everyone within an economic coverage to a supply at the pooled average rate.

The plan necessitated the supply undertaking carrying the responsibility for all main and skeleton feeders throughout the area, irrespective of the location of the individual applicant.

A scheme incurring these responsibilities naturally required careful consideration of the relevant factors. Mining, whilst providing the

basis on which development could be commenced, would in all probability decline in importance as the density of population increased. Agriculture has to date not used electricity to any great extent as an aid to increased efficiency and to reduce the consumption of manpower. It is obvious this must eventuate. The tobacco curing load was visualised as a distinct future source of demand. When reference is made over a period to growth of agriculture, coupled with the assistance of mining, it was apparent the risk would be a negligible factor, and no different from that involved in every human venture. The stability of the areas' economy was therefore reasonably assured.

Nevertheless, whilst the Council of the day showed a great foresight, it was forced to plan cautiously for the economics limited the wide extension of electricity beyond the Municipal boundaries.

Whilst conscious that its responsibilities to the rural area were inseparable from those to its ratepayers, and that their common welfare was interwoven, the Council found its outlook curtailed by these economic controls which the problem of a widely served area introduces.

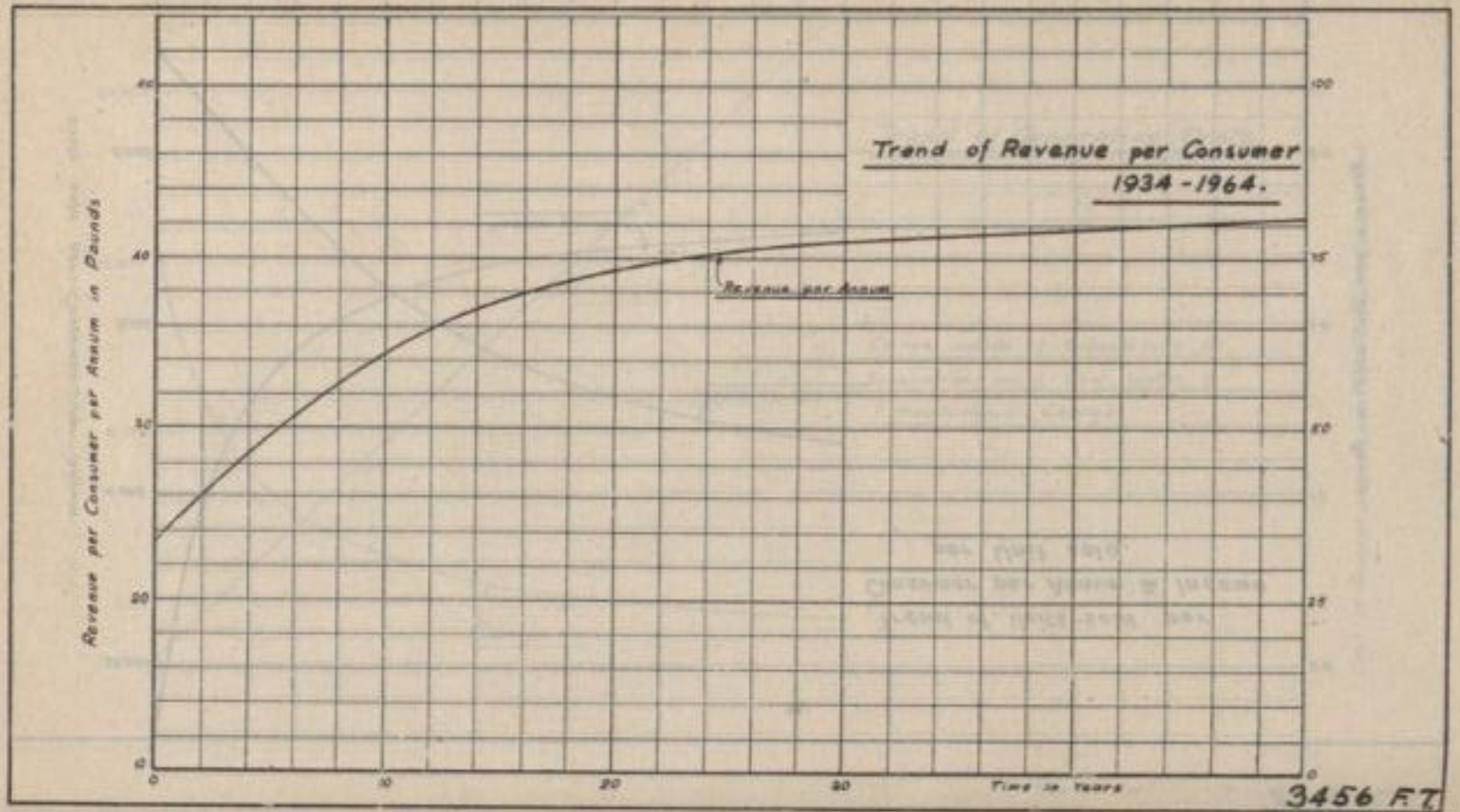
2.20 **Bases of calculating economic area.** In order, therefore, to pre-determine the economic radius of supply, it was essential to assume the accuracy of a number of basic future trends, namely:—

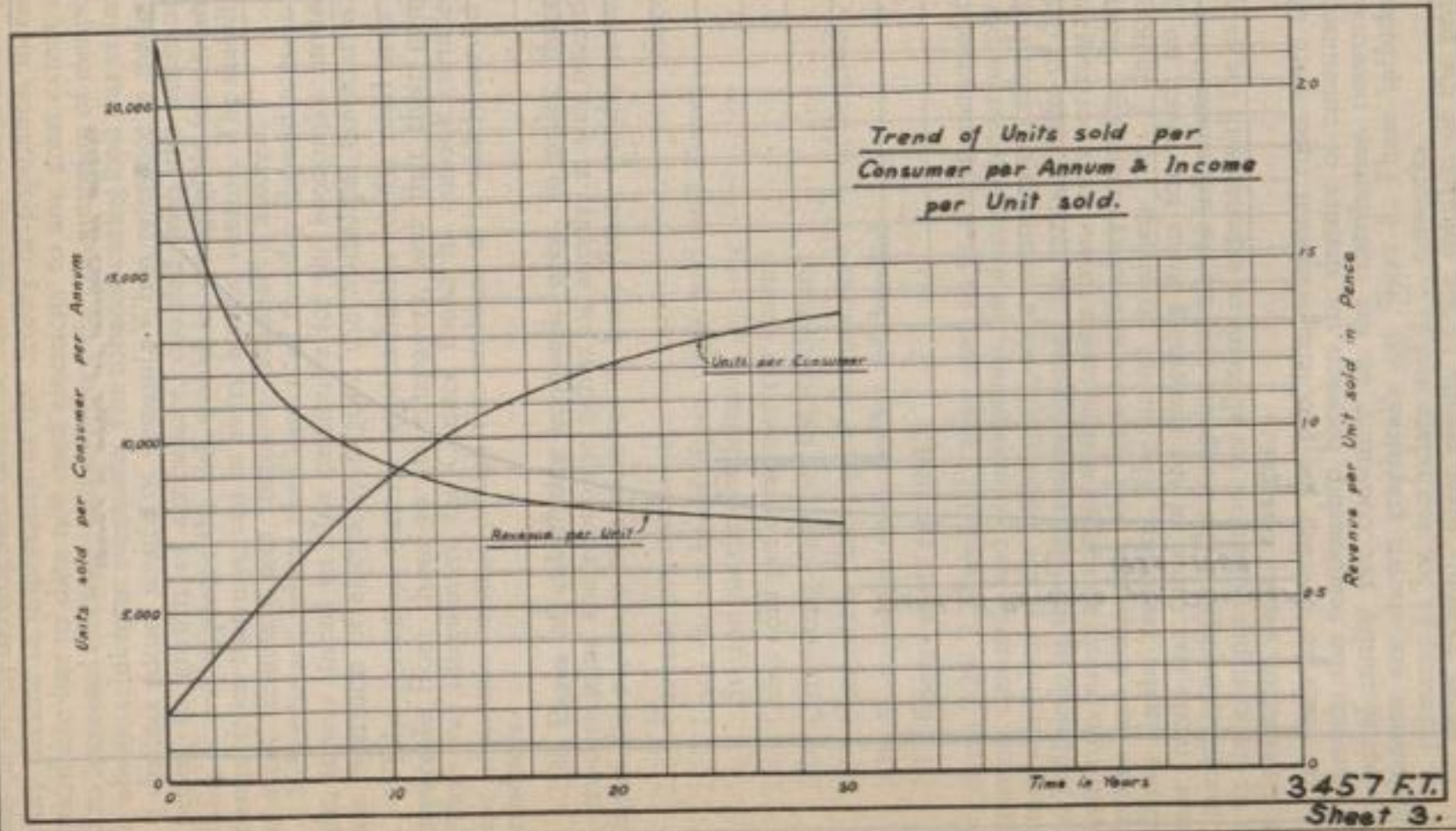
| | | |
|---|---|---|
| 2.21 | Revenue per consumer ... ... ... ... | Sheet 2 |
| 2.22 | Load factor based upon units sold and Power Station maximum demand ... ... ... | ,, |
| 2.23 | Units sold per consumer per annum ... ... | ,, 3 |
| 2.24 | Generating costs per kw. of demand ... ... | ,, 4 |
| 2.25 | Generating plant capital charges per kV.A. of demand | ,, 5 |
| 2.26 | Management costs per kw. of demand ... ... | ,, 6 |
| 2.27 | Energy costs per unit ... ... ... ... | ,, 7 |

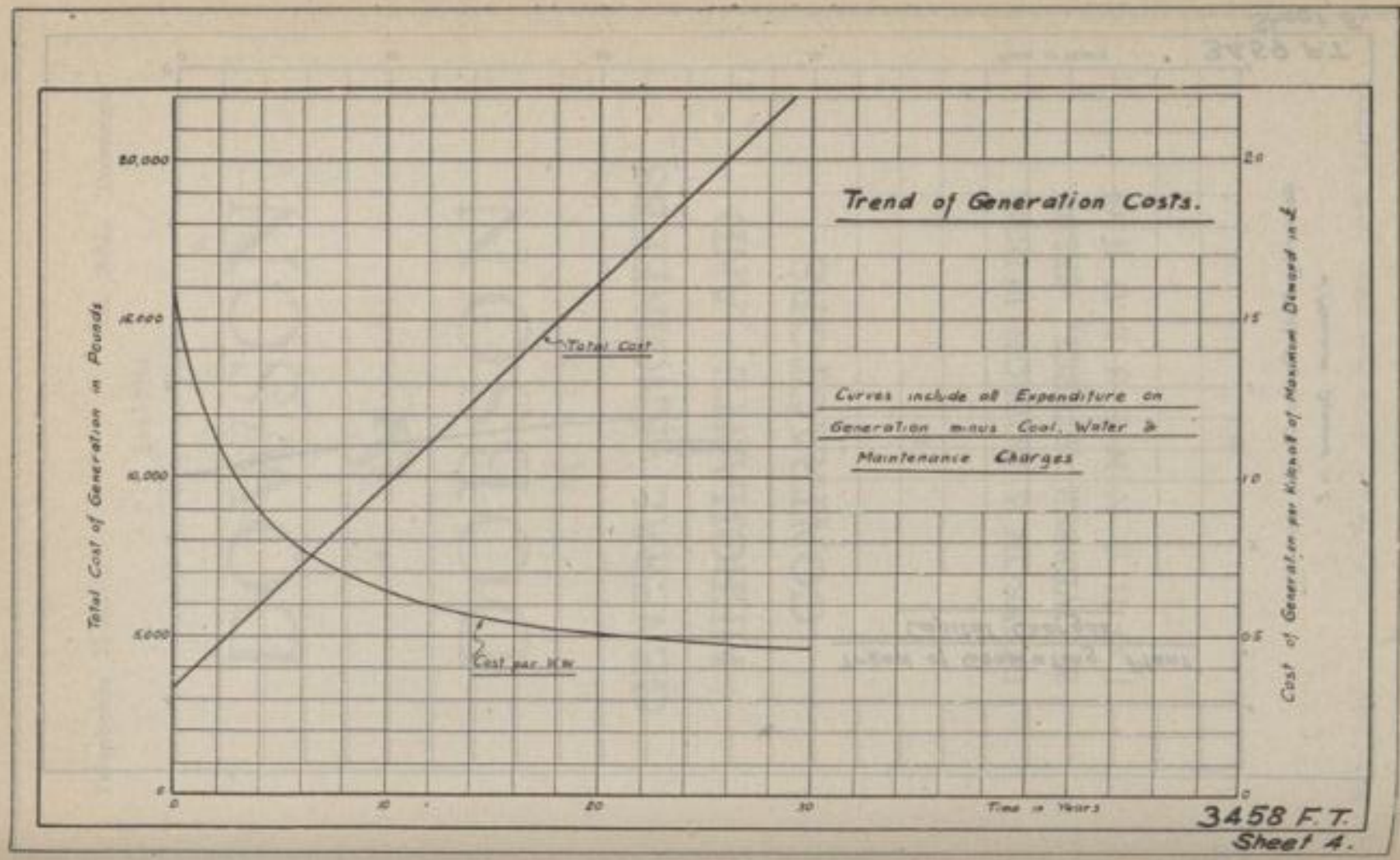
Items 2.21, 2.22 and 2.23 were used to fix the character of future consumer demands and consumptions. In doing so, revenue per consumer was taken as the limiting amount a consumer can afford directly and indirectly as the City passes through the various stages of development, from purely an administrative centre to one incorporating tertiary services and industries, and later to secondary industries. Item 2.23 follows similar reasoning. The curves on sheets 2 to 7 demonstrate these trends and those of the remaining items for which no special comment is necessary. The foregoing provide the information necessary to fix the cost per consumer for all items of expense with the exception of distribution capital charges.

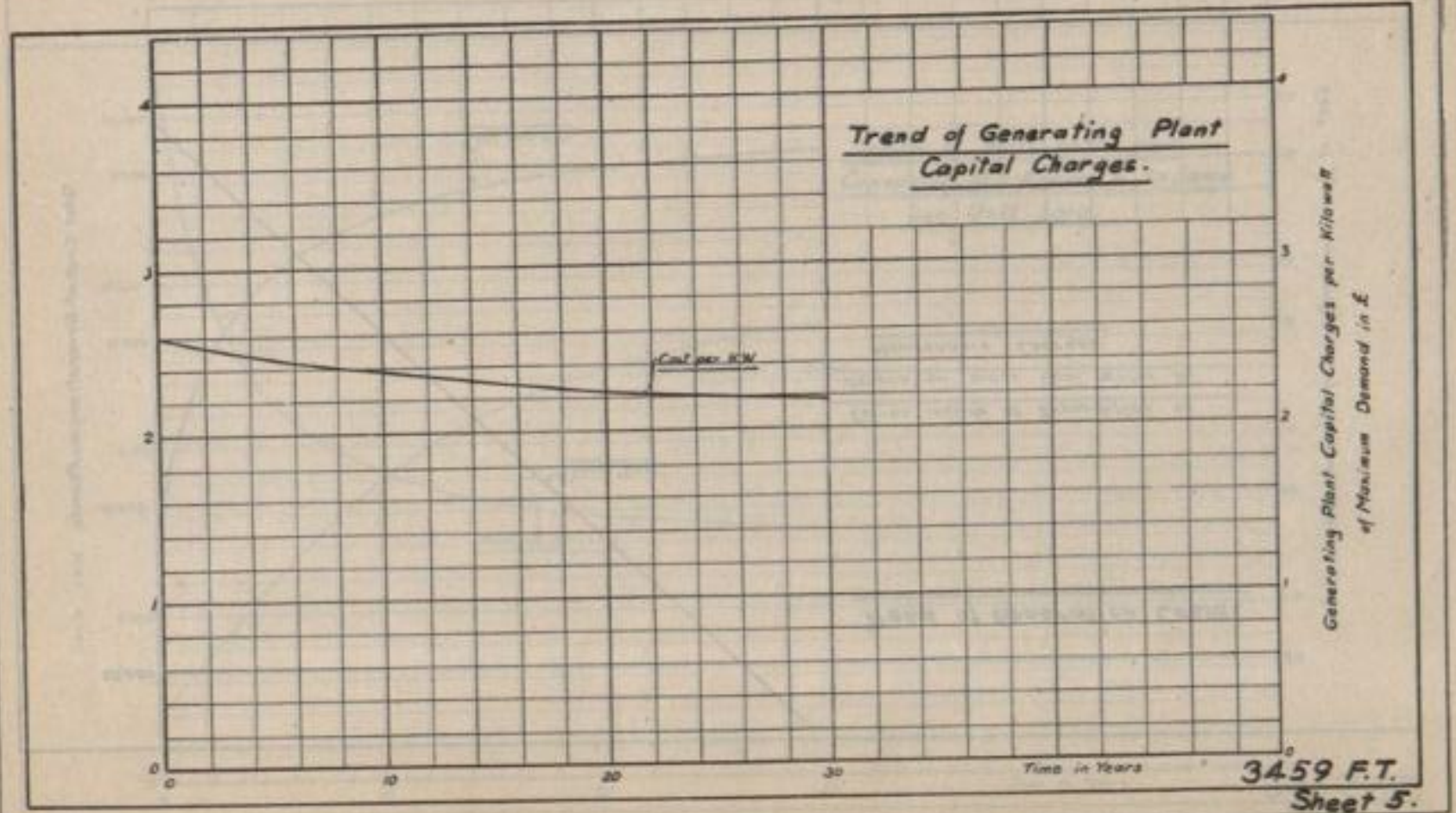
In order to develop the problem, statistical rules were applied to ascertain the relationship between the density of consumers and the capital outlay per consumer on the distribution network. The conclusions are shown graphically on Sheet 8. These include for a 33 kv. primary, 11 kv. secondary and L.T. networks.

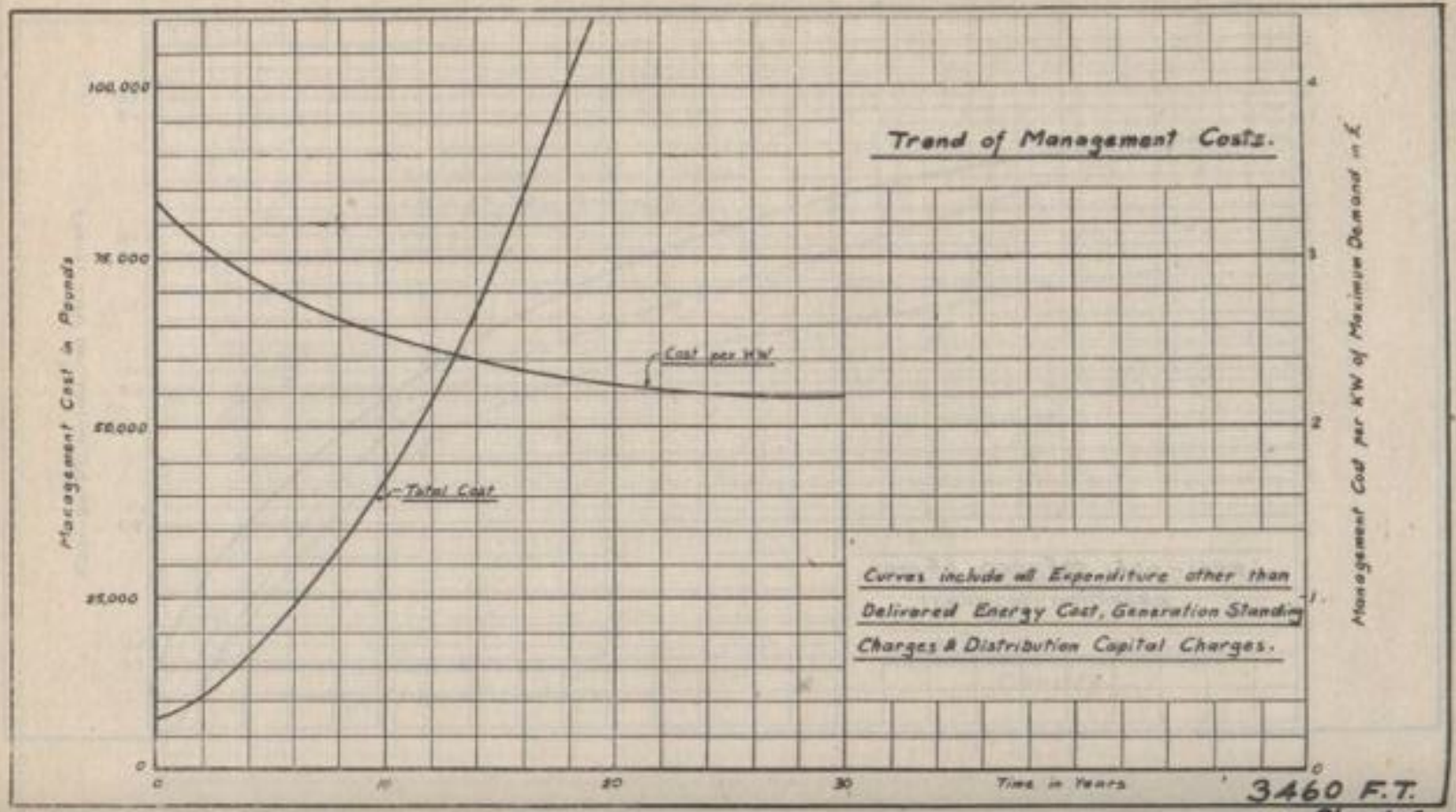
In order to apply these results to the solution of the problem, it was finally necessary to determine the trend of consumer density

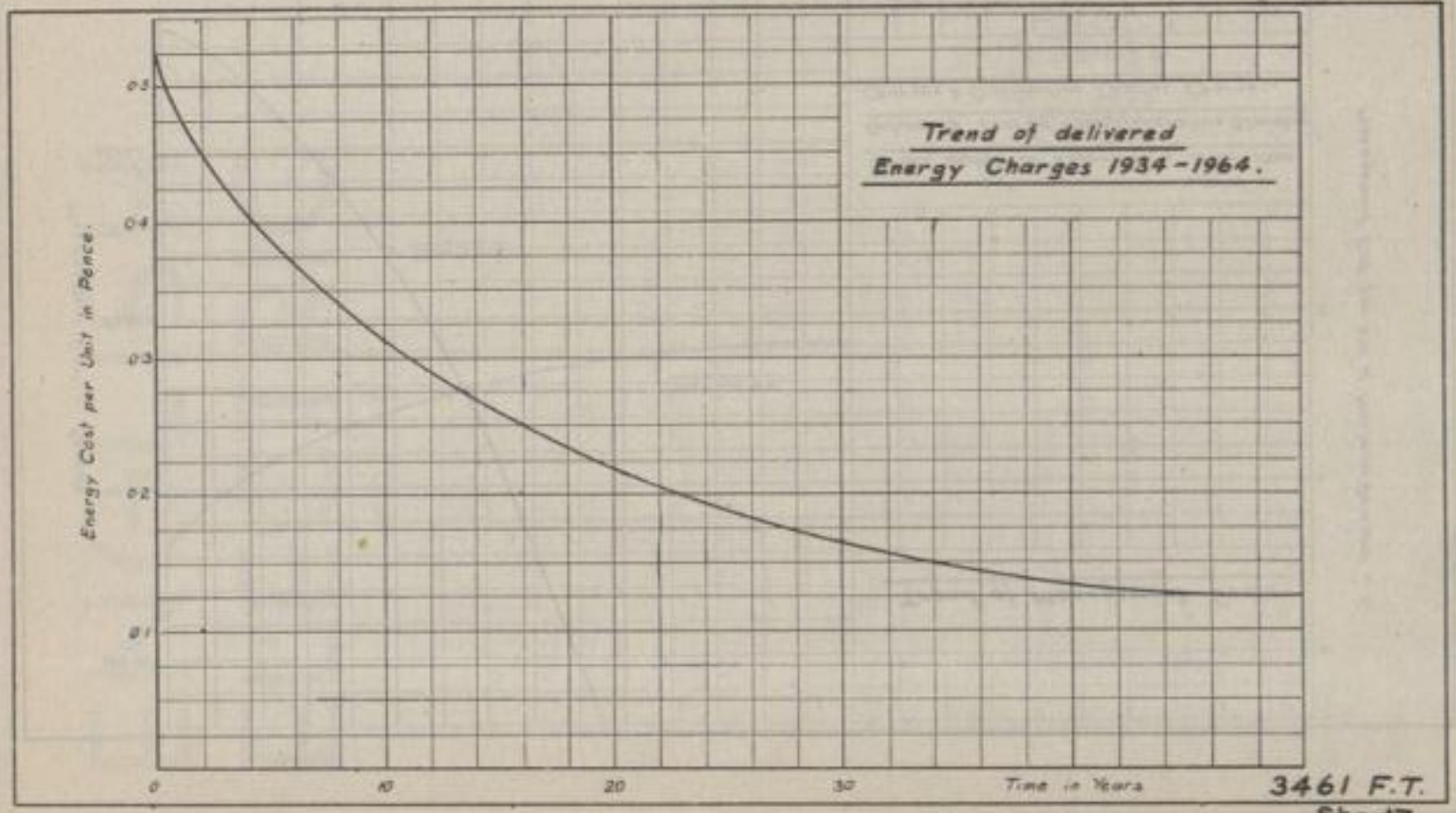

Trend of Revenue per Consumer
1934 - 1964.
Revenue per Consumer per Annum in Pounds
Revenue per Annum
Time in Years
0
10
20
30
40
50
100
75
50
25
0
3456 F.T.
Sheet 2.


Trend of Units sold per Consumer per Annum & Income per Unit sold.
Units sold per Consumer per Annum
Revenue per Unit sold in Pence
Units per Consumer
Revenue per Unit
Time in Years
20,000
15,000
10,000
5,000
0
10
20
30
2.0
1.5
1.0
0.5
0
3457 F.T.
Sheet 3.

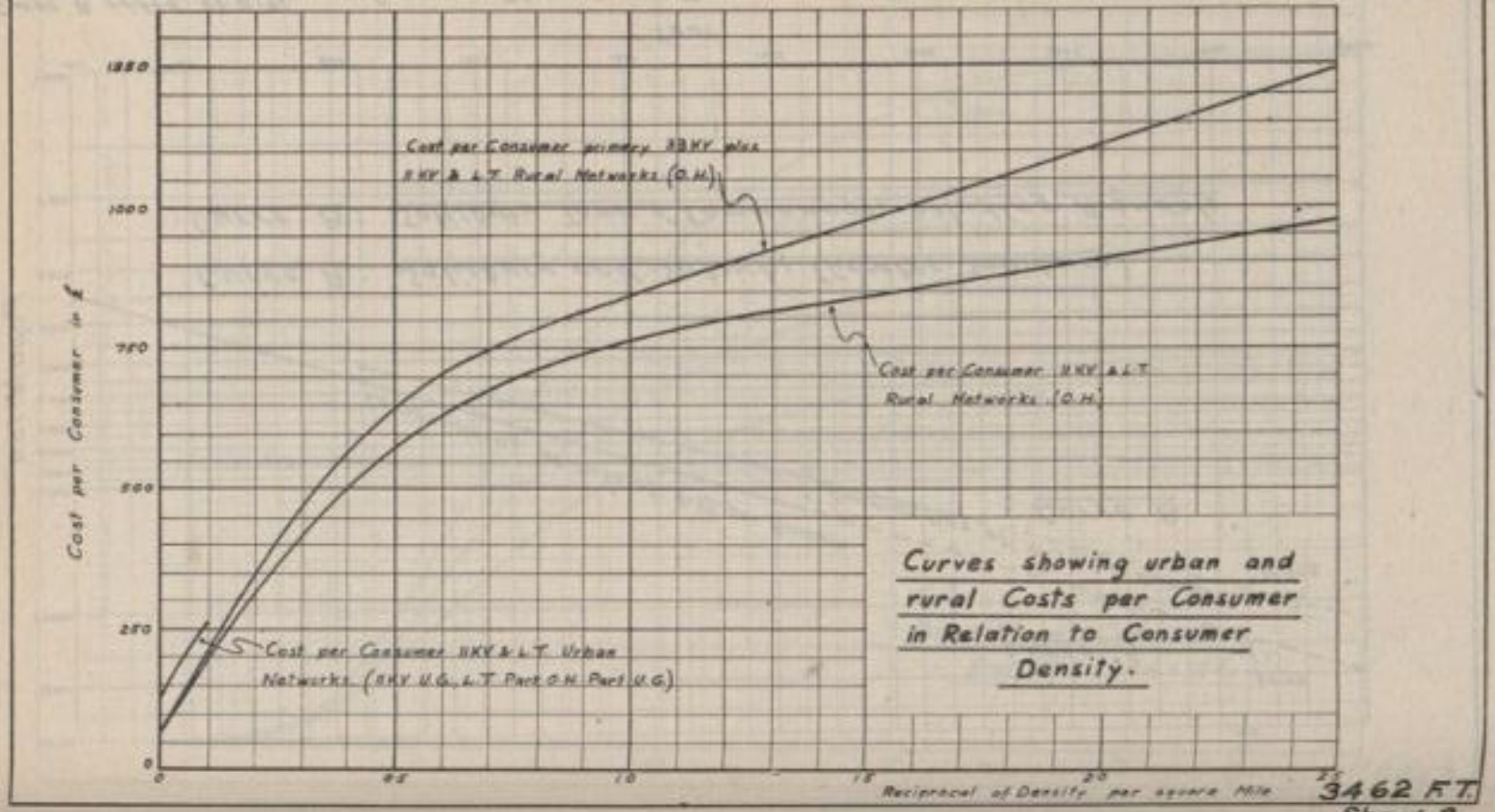

Trend of Generation Costs.
Curves include all Expenditure on Generation minus Coal, Water & Maintenance Charges
Total Cost
Cost per K.W.
Total Cost of Generation in Pounds
Cost of Generation per Kilowatt of Maximum Demand in £
Time in Years
50,000
25,000
10,000
5,000
0
20
15
10
0.5
0
10
20
30
3458 F.T.
Sheet 4.


Trend of Generating Plant Capital Charges.
Cost per KW.
Generating Plant Capital Charges per Kilowatt of Maximum Demand in £
Time in Years
0
10
20
30
1
2
3
4
3459 F.T.
Sheet 5.

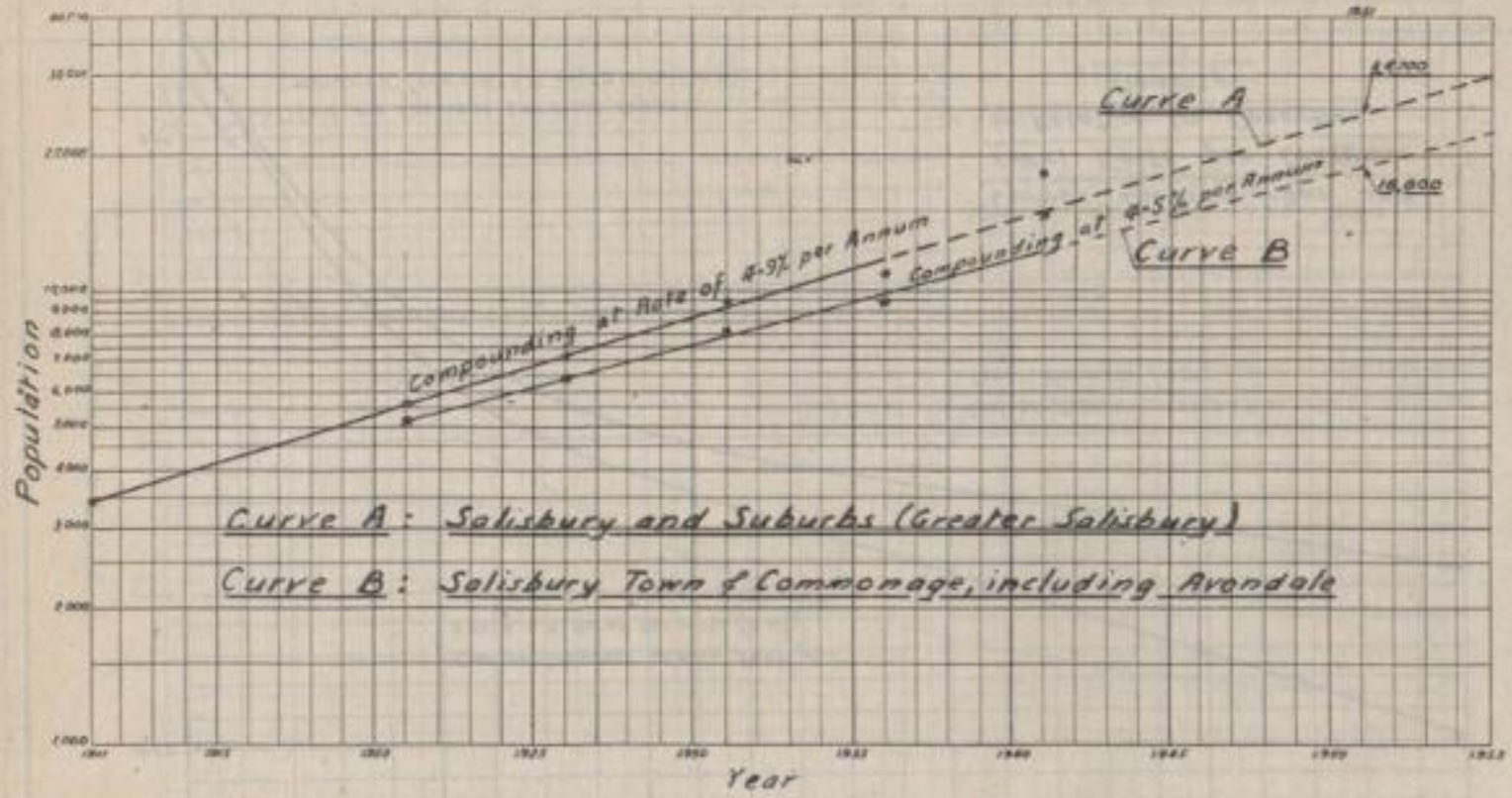

Trend of Management Costs.
Management Cost in Pounds
100,000
75,000
50,000
25,000
0
Cost per K'W
Total Cost
Curves include all Expenditure other than Delivered Energy Cost, Generation Standing Charges & Distribution Capital Charges.
Management Cost per K'W of Maximum Demand in £
4
3
2
1
0
0
10
20
30
Time in Years
3460 F.T.
Sheet 6.




3461 F.T.
Sheet 7.


1250
1000
750
500
250
0
Cost per Consumer in £
Cost per Consumer primary 33KV plus 11KV & L.T. Rural Networks (O.H.)
Cost per Consumer 11KV & L.T. Rural Networks (O.H.)
Cost per Consumer 11KV & L.T. Urban Networks (11KV U.G., L.T. Part O.H. Part U.G.)
0
5
10
15
20
25
Reciprocal of Density per square Mile
Curves showing urban and rural Costs per Consumer in Relation to Consumer Density.
3462 F.T.
Sheet 8.

07



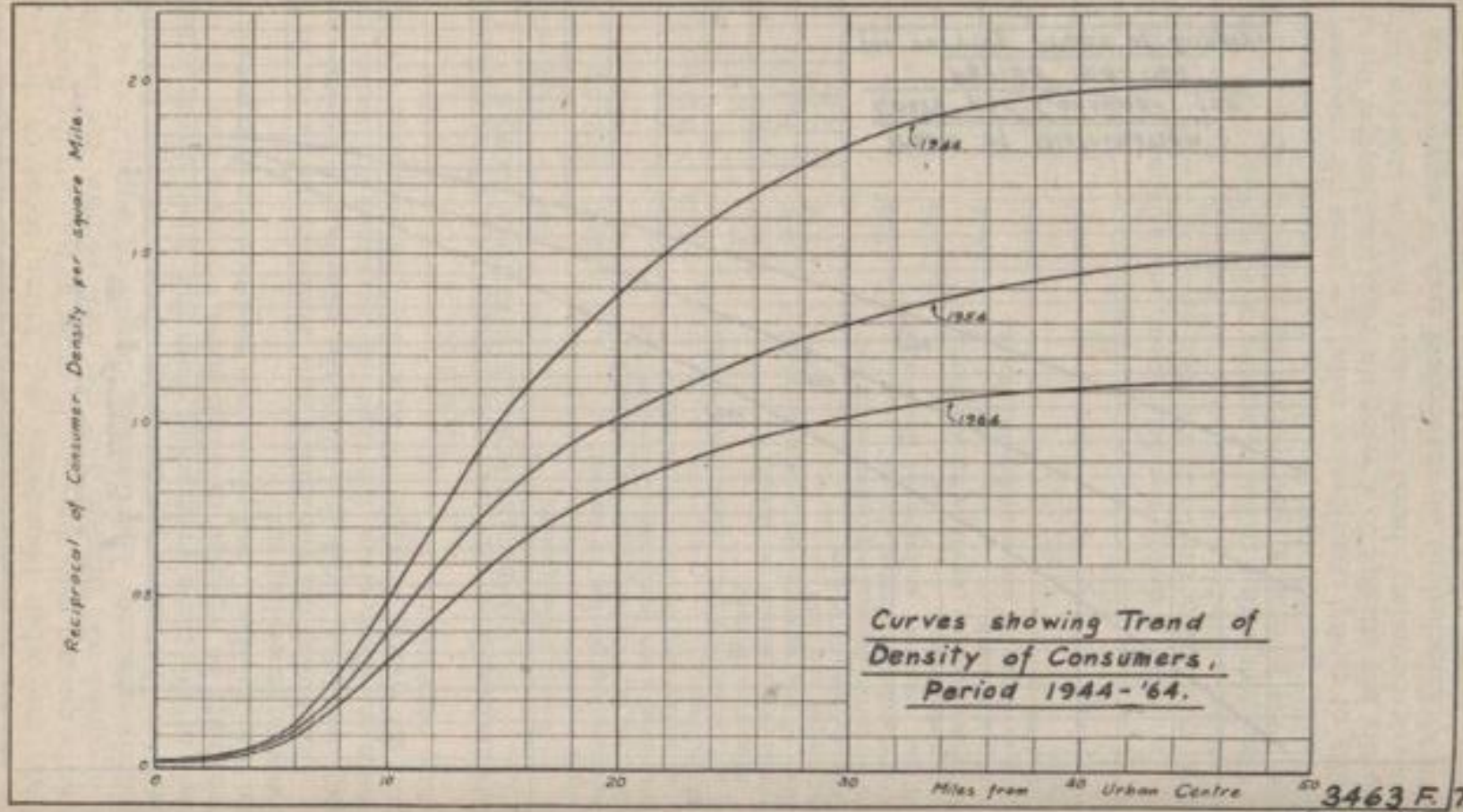

Curve B added 21-8-41

City of Salisbury
Electricity Department
12-3-41

## Curve Showing European Population of Salisbury and Suburbs Based on Census Figures

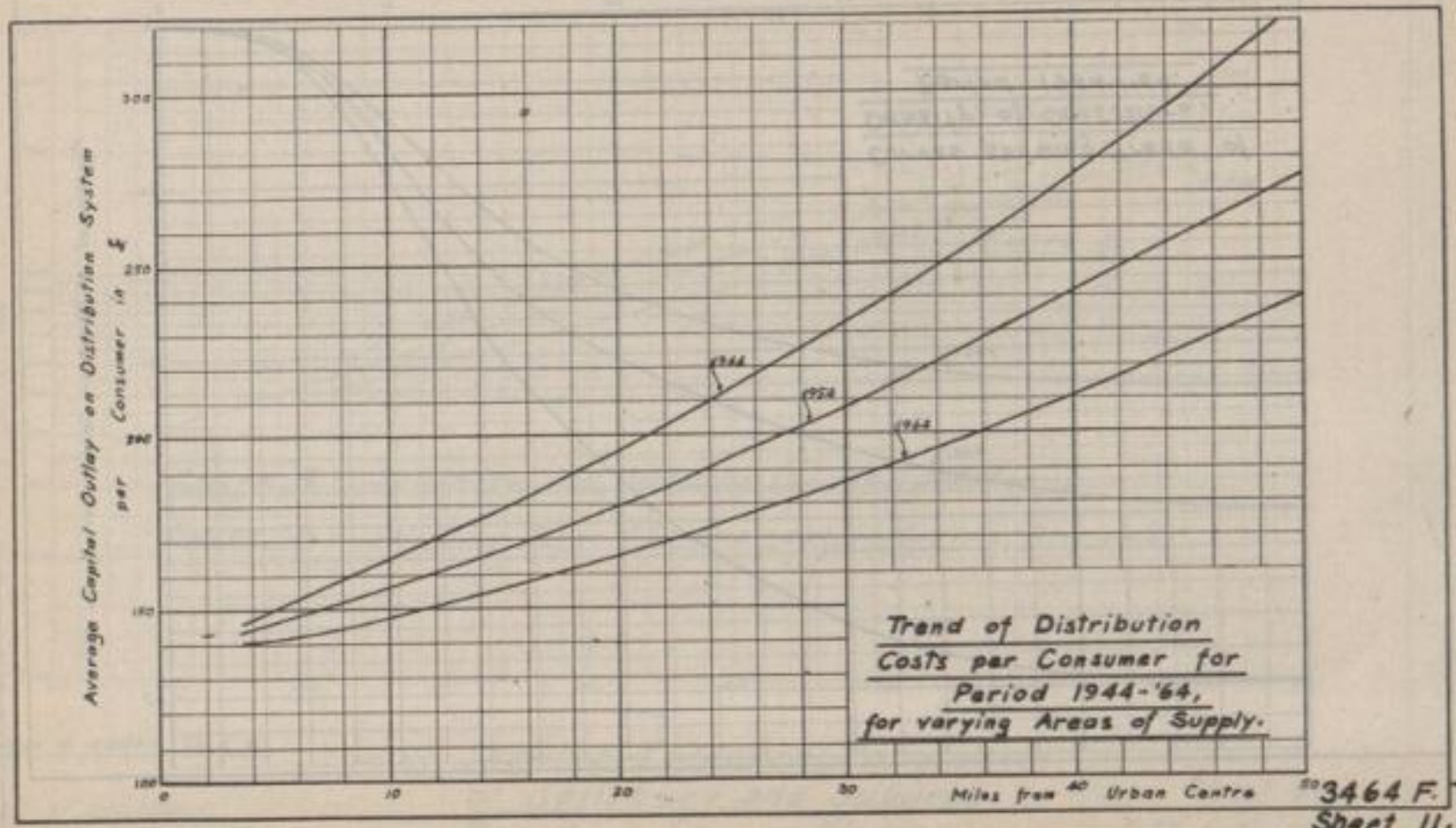
Sheet 9.

1812 F.T.




Curves showing Trend of Density of Consumers, Period 1944-'64.

3463 F. T.
Sheet 10.




3464 F. T.
Sheet 11.

within the City and outwards from its centre.

The curves on Sheet 9 show the rates of increase of population within the urban boundaries and within those of the peri-urban suburbs merged with the City. In order to forecast the future,the rate so obtained was utilised. For the rural picture, the rate used was similarly obtained. The resulting density of population is shown on Sheet 10. The curves are drawn for 10-year intervals from 1944. The shape of the curve proceeding from the urban centre would in all probability be repeated in a like manner moving from the next large centre to Salisbury, and provides a yardstick for determining the next economic generating site.

Combining the particulars now available, the curves in Sheet 11 detail for 1944, 1954 and 1964 the distribution capital outlay per consumer. These show the effect of increasing the radius of supply upon the overall average capital outlay per consumer for the distribution network.

TABLE No. 4

DETERMINATION OF CAPITAL EXPENDITURE AVAILABLE PER CONSUMER FOR DISTRIBUTION WORKS

| Designation | 1944 | 1954 | 1964 |
|---|---|---|---|
| Generating cost per kw. of demand ... ... | £0.64 | £0.52 | £0.47 |
| Generating capital charges per kw. of demand | £2.375 | £2.23 | £2.175 |
| Management costs (including distribution, but excluding distribution capital charges) ... | £2.55 | £2.25 | £2.18 |
| Energy charge ... ... ... ... ... | 0.313d. | 0.219d. | 9.166d. |
| L.F. per annum on units sold and Power Station maximum demand ... ... ... | 40% | 43% | 46% |
| Revenue per consumer per annum ... ... | £34.5 | £39.4 | £41 |
| Units sold per consumer per annum kwhours | 9,000 | 12,220 | 13,500 |
| Revenue per unit sold ... ... ... ... | 0.93d. | 0.78d. | 0.73d. |
| Maximum demand in kws. ... ... ... | 2.56 | 3.24 | 3.35 |
| Cost per kw. of demand per consumer exclusive of distribution capital charges ... ... | £5.565 | £5.00 | £4.825 |
| Cost per consumer exclusive of distribution capital charges ... ... ... ... | £25.95 | £27.33 | £25.49 |
| Balance available per consumer for distribution capital charges ... ... ... ... | £8.55 | £12.07 | £15.51 |
| Capital available per consumer for distribution system ... ... ... ... ... | £142.5 | £203 | £258.5 |
| Interest —4.06% | | | |
| Sinking fund —1.94% | | | |
| Total ...6% | | | |

Table No. 4 details the determination of the amount available for capital expenditure on the distribution network It will be noted in 1964, the amount available per consumer will be £258.5 and the average cost per consumer with a radius of supply of 50 miles is £233. The starting point 1934 gives a 30 year period for which to design the network. The results provide data for the feeder demand to be met, and the subsidy or capital contribution called for from the consumer in order to justify any attempt to develop the rural load beyond the theoretical economic boundary, based only upon revenue account income.

2.30 **Conclusions on theoretical area of supply.** In the examination, the capital contribution or subsidy necessary and for what period is clearly shown. For these reasons a compromise was adopted to

determine coverage and supplies limited to areas where a basic mining load enabled the Department to anticipate the ultimate wider economic boundaries. In addition, an averaged capital contribution as a connection fee is charged, plus a fixed minimum.,

Sheet 12 depicts the Salisbury area and the projected 33 kv. primary network. It will be noted hexagons of 22 miles across the flats divide the area into 11 kv. districts. In the early progress towards the completed plan, the remoter districts would seem to justify individual plants and networks which ultimately could be merged in the extended primary network.

In laying out 33 kv. feeders, the ultimate limits were kept in view, and the design incorporated provision for the loads then necessary. Meantime, the provision of sums ex revenue account surpluses and capital contributions by the consumer enable supply to be given which otherwise could not economically be justified.

## 3.00 LAYOUT OF NETWORK

3.10 **Planned 33 kv. primary and 11 kv. secondary networks.** The 33 kv., 11 kv. and L.T. networks have of recent years been planned to fit ultimately into the final plan. Meantime, much older work and even present additions are expedient measures in the interests of economy. Sheet 12 details diagrammatically the 33 kv. network planned to radiate from a central 11/33 kv. step-up substation in the Power Station grounds, all fed direct from Power Station No. 2. Until this is constructed, the 11 kv. underground feeders have been laid out radially, and in a series of rings from Power Station No. 1 and a central substation in the City area.

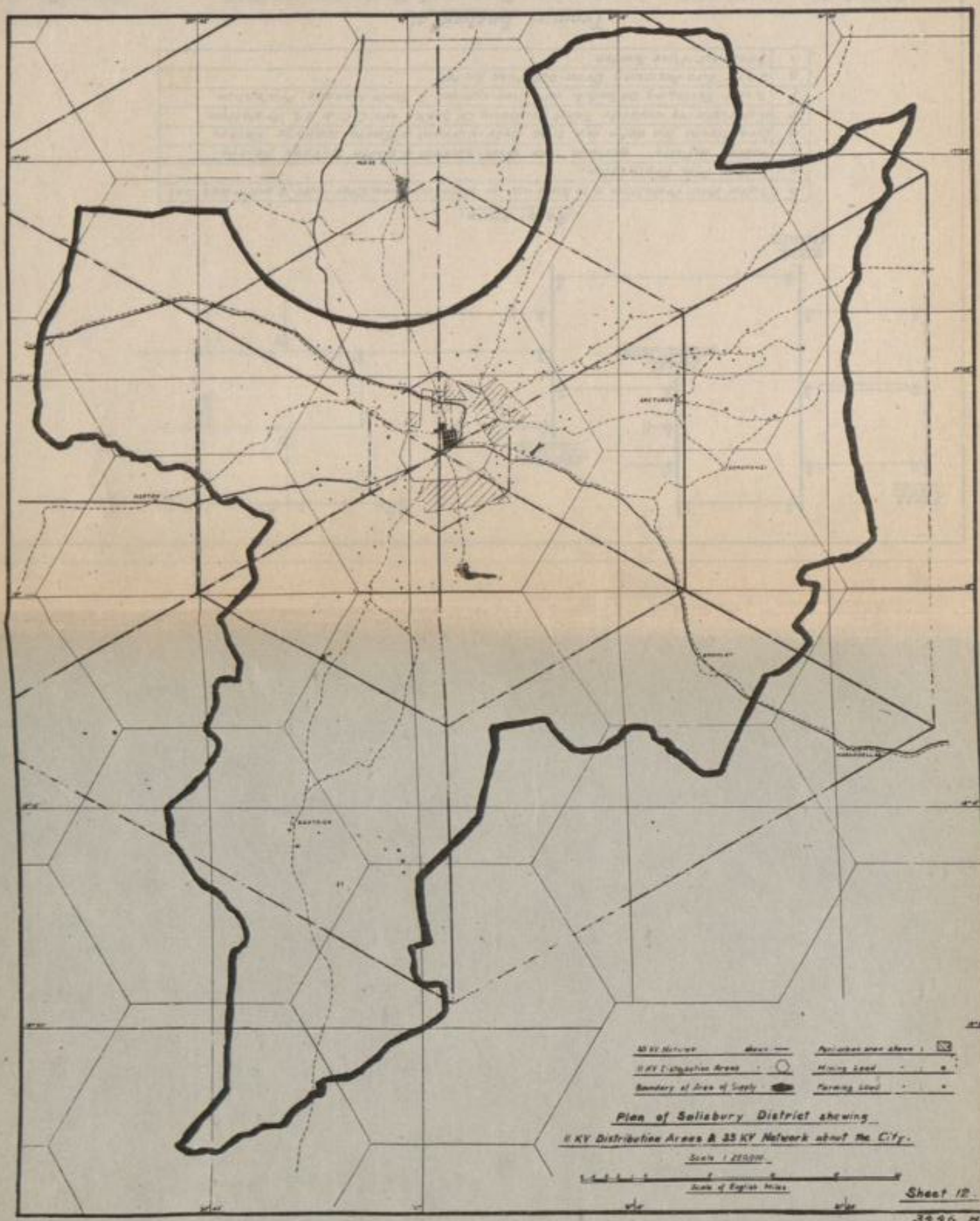
The rural network has followed the principle enunciated earlier, and represents a compromise in regard to coverage. The main developments have centred around the mining areas. The 11 kv. network is designed to merge into the major plan with centrally situated transforming points.

3.20 **Protection of distribution plant and equipment.** The protection of distribution plant and equipment follows conventional lines, and is temporarily designed to meet the immediate layout. As the network is developed towards the final layout, the various expedients will naturally be modified. It was explained that the present network included supply to a main distributing substation in the City area, the protection of which is by Solkor pilot protection, with back up inverse definite minimum time over-current and earth leakage relays on the switches at the Power Station end of the feeders.

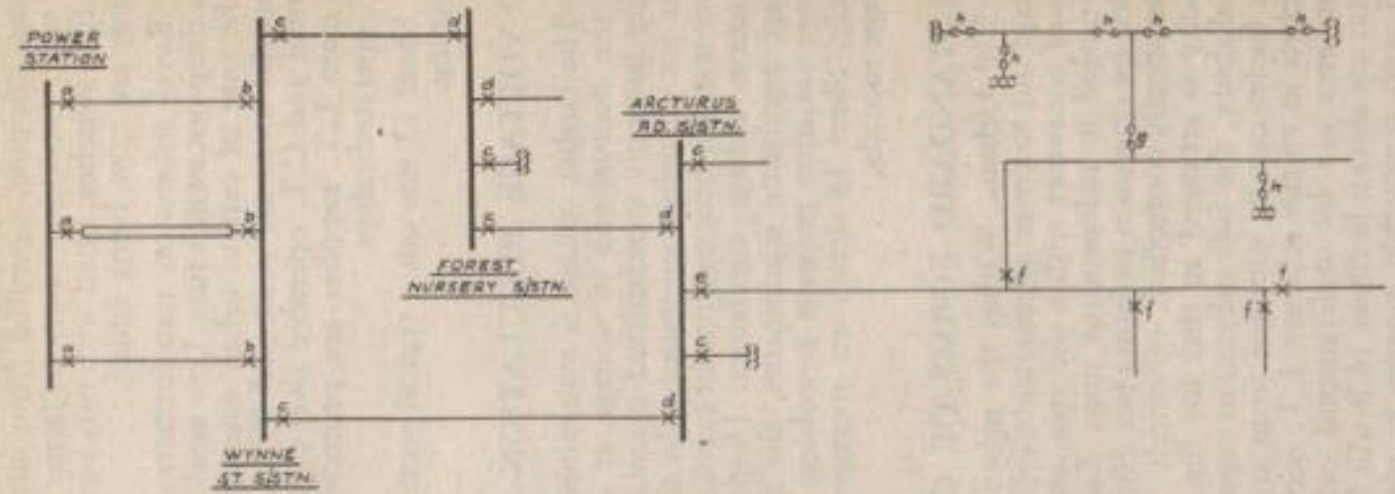
Ring mains are protected by means of inverse definite minimum time lag relays, with over-current and earth leakage elements fitted to the O.C.B's. Directional relays are fitted in suitable situations, and where their application is desirable.

The substation transforming equipment is protected by over-current and earth leakage relays tripping the O.C.B.

Radial feeder switches in substations, where of the automatic type, have 3-shot reclosures and over-current and earth leakage relay protection.


Plan of Salisbury District showing
11 KV Distribution Areas & 33 KV Network about the City.
Scale 1 2500ft
Scale of English Miles
Sheet 12.

3990 H.T.




## Reference.

| | |
|---|---|
| a | Solkor Pilot Protection with Back-up inv. defin. min. time Over-curr. & earth leak. rel. |
| b | Solkor Pilot Protection. |
| c | Inverse definite minimum time Over-current & Earth leakage Relays. |
| d | Directional inv. defin. min. time Over-current & Earth leakage Relays. |
| e | High rupturing capacity 3-shot Reclosing Oil Switch with O.C. & E.L. Protection. |
| f | 3 shot Reclosing Oil Switch with Over-current & Earth leakage Protection. |
| g | 2 shot Auto-Reclosing Drop-out Fuse Switch. |
| h | Drop-out Fuse Switch. |

## Typical Section of Distribution 11 KV Network showing Forms of Protection applied.

Sheet 13.

3454 F.T

Spur lines from main radial feeders are protected by outdoor O.C.B's of the 3-shot reclosing type, fitted with over-current and earth leakage tripping, operated from current transformers situated inside the tank. Secondary spurs to farms are protected by means of drop-out fuse switches, fitted with two automatic reclosures. Delaying action fittings are now being added.

Rural substation transformers are protected on the H.T. side by a drop-out switch fuse. Low tension protection is by fusegear, except in the case of certain urban substations, where individual circuits in industrial areas are protected by O.C.B's or air break switches with thermal and C.T. operated over-current relays. In urban substations, the main L.T. supplies are protected by O.C.B's with over-current C.T. operated relays...

Sheet 13 sets out a typical section of the network illustrating the foregoing.

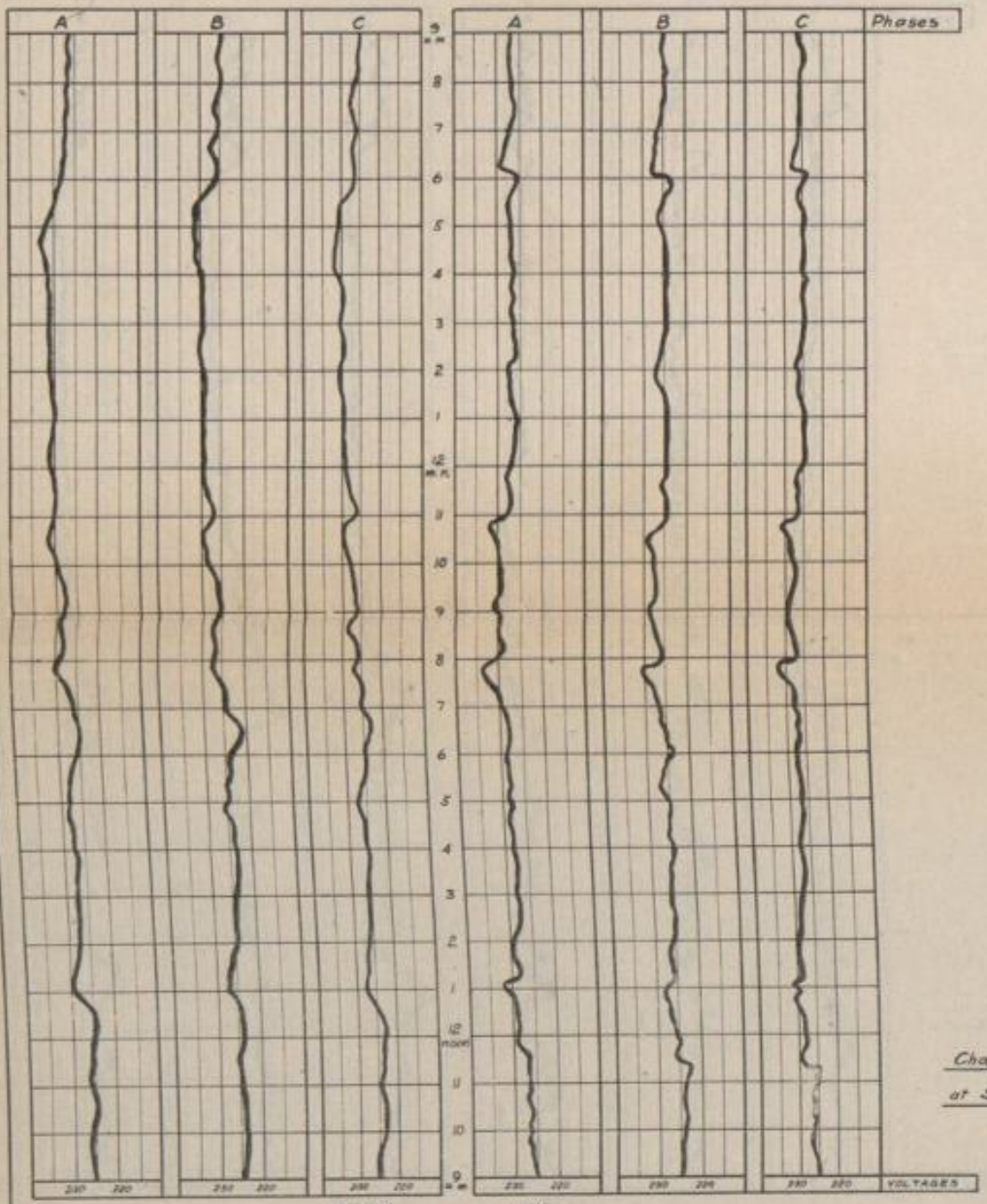
## 4.00 VOLTAGE REGULATION

The busbar voltage is maintained at fixed values. In order to iron out the fluctuations in voltage at consumers' premises, the undertaking has now standardised upon auto-on-load tap changing equipment for all urban substations. In the case of peri-urban substations where transforming equipment exists, it was decided to instal automatic induction voltage regulators. Despite the use of these automatic voltage regulating equipments, the maintenance of narrow limits of voltage variation presents a problem which has not been solved completely. Sheet 14 details an average set of substation and consumer voltage records.

## 5.00 STANDARD FORMS OF CONSTRUCTION

5.10 **Urban.** Within the urban centre, the transforming points are laid out to cover approximately 40 to 50 acres, depending upon the class of consumer within the area, and the density. The feeder system is arranged in independent rings. Each ring supplies substations controlled by ring main isolators (see Sheet 13), and also at wider intervals automatically-controlled oil-switch substations. The transformer capacity is arranged so that for the short winter period experienced in Salisbury, the full substation capacity is in use. On the L.T. side, each feeder can be supplied from an alternative connection manually switched in to the adjacent L.T. network. All 11 kv. supplies in the urban area are by underground cable. The standard types of substation are shown in Sheet 16.It will be noted a design has been developed with removable louvres in place of doors to the transformer chambers. The two types shown detail the ring main and fully automatic H.T. switchgear substations.

The L.T. supplies from each substation are by cable and overhead construction, erected in service lanes at the back of each stand. Sheet 17 and 18 details these forms. The standards supporting L.T. lines are reinforced concrete poles with vertical formation of conductors. Lightning arresters are fitted to each end of the line.

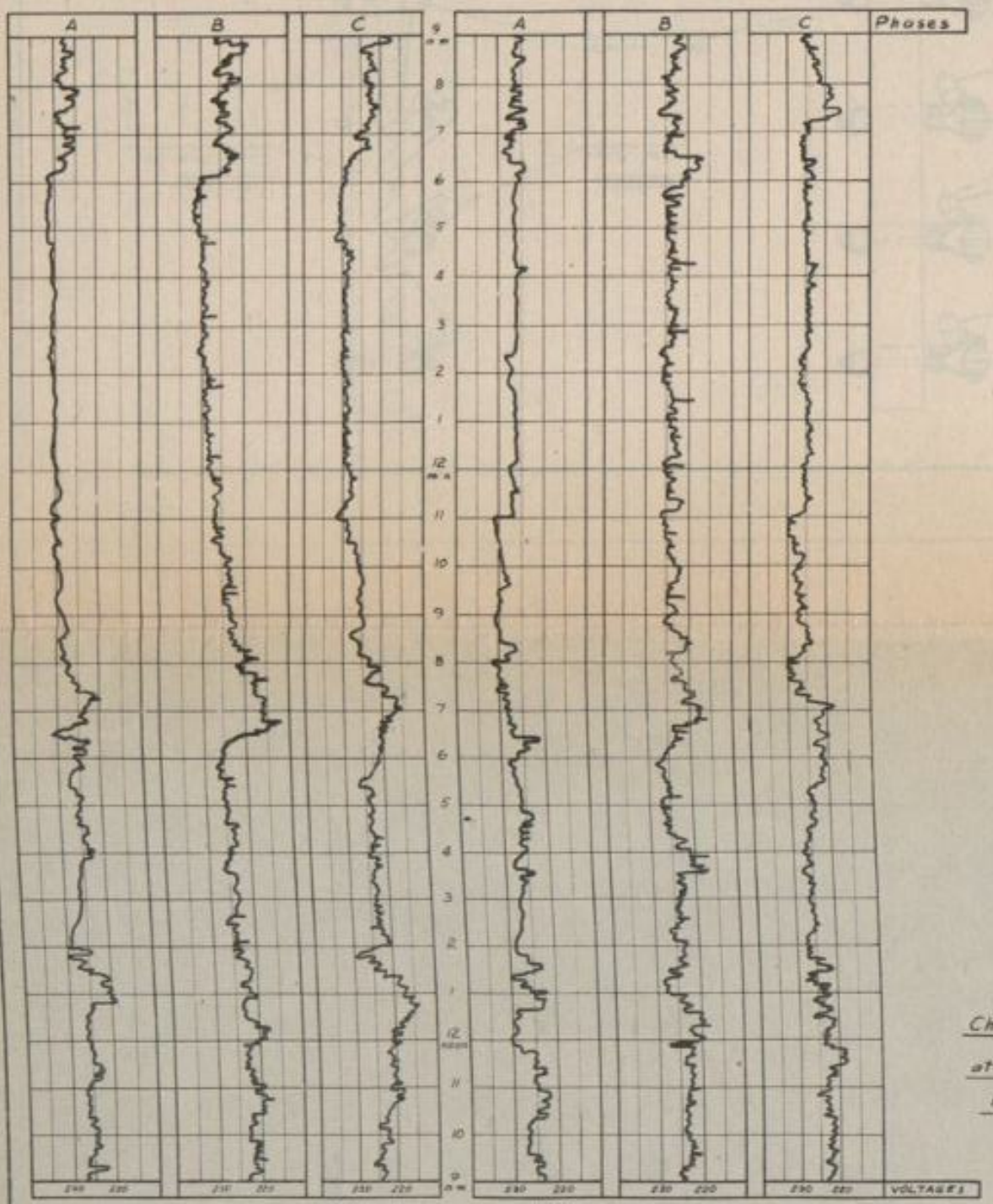



Charts recorded at Sub-Station.

## Voltage Variation Charts.

Sheet 14(a).

3448 Q.T.




Charts recorded at Consumer's Premises.

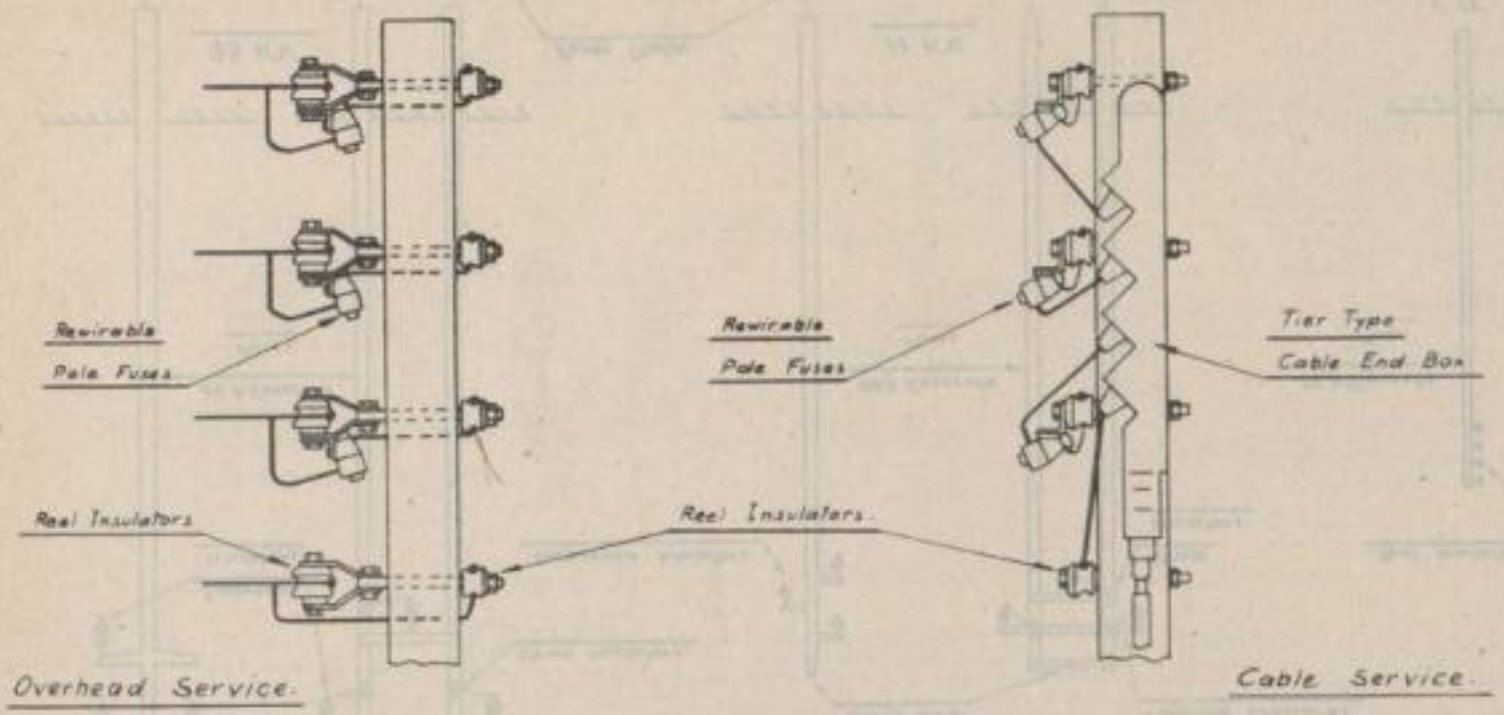
Without Voltage Regulation.

With

Voltage Variation Charts.

Sheet 14(b).

3449 Q.T.

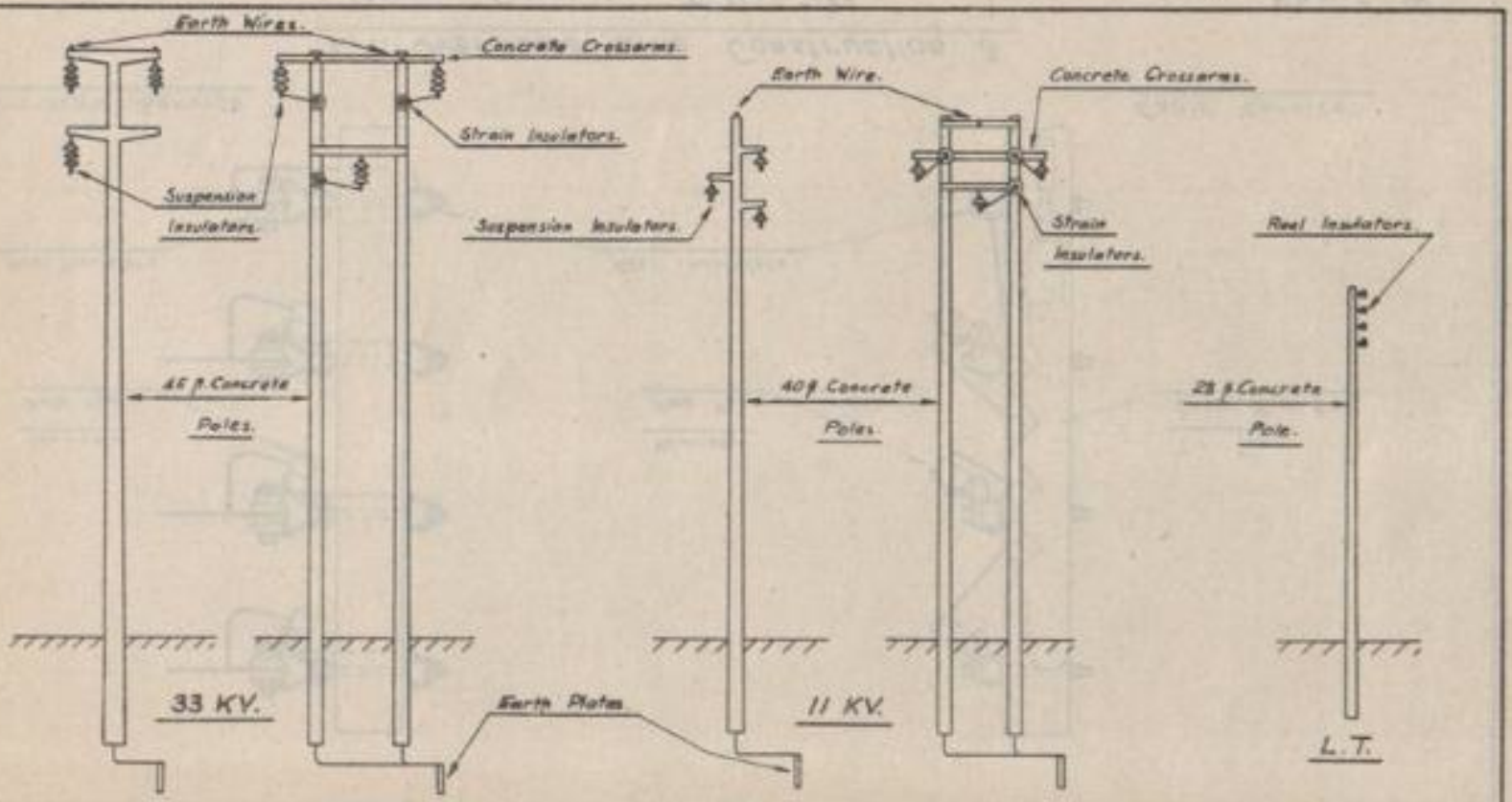



L.T. Overhead Line Construction &

House Service Take-off.

Sheet 18.

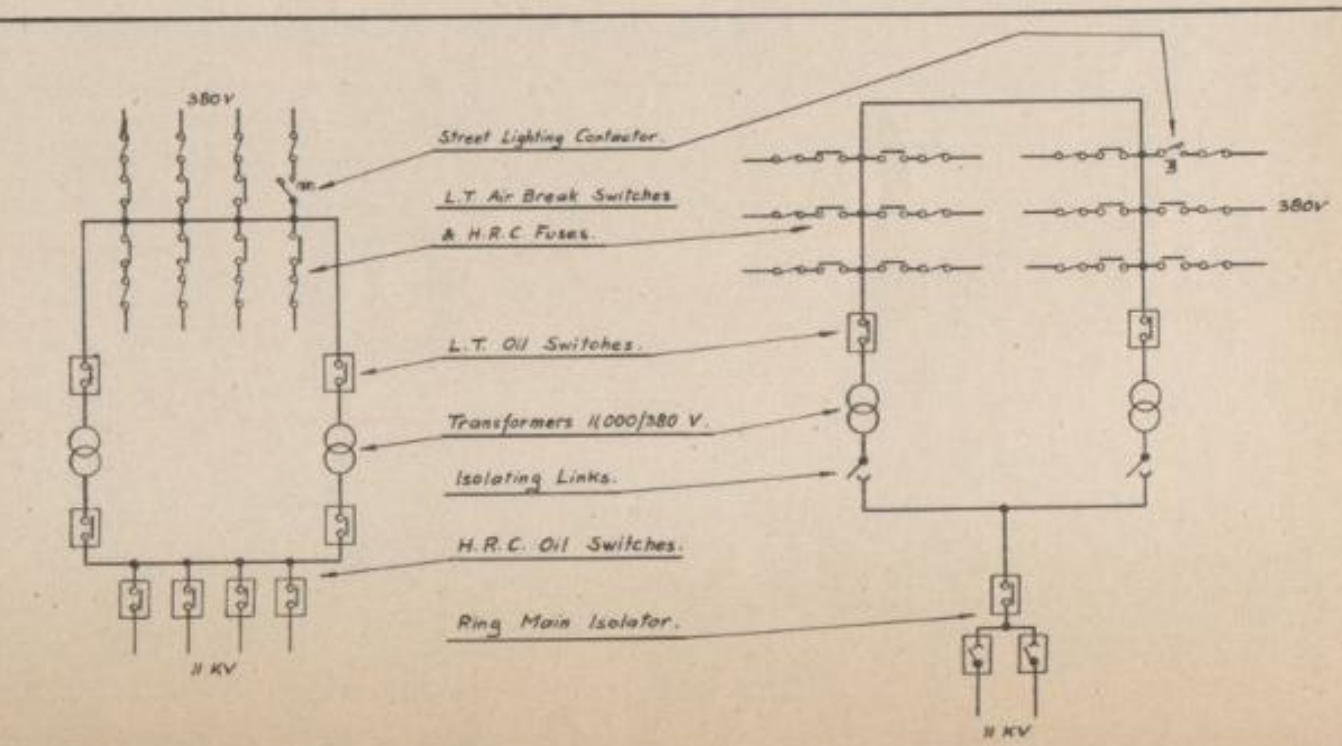
3453 F.T.

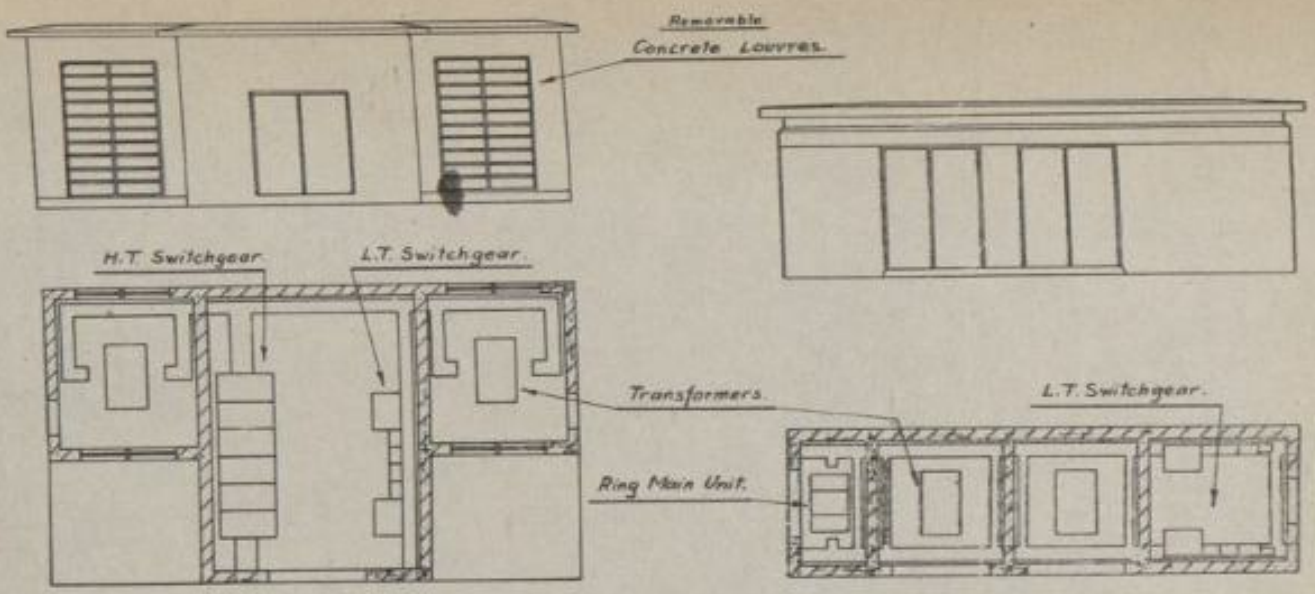



Standard Forms of Conductor Supports.

Sheet 15.

3452 F.T.



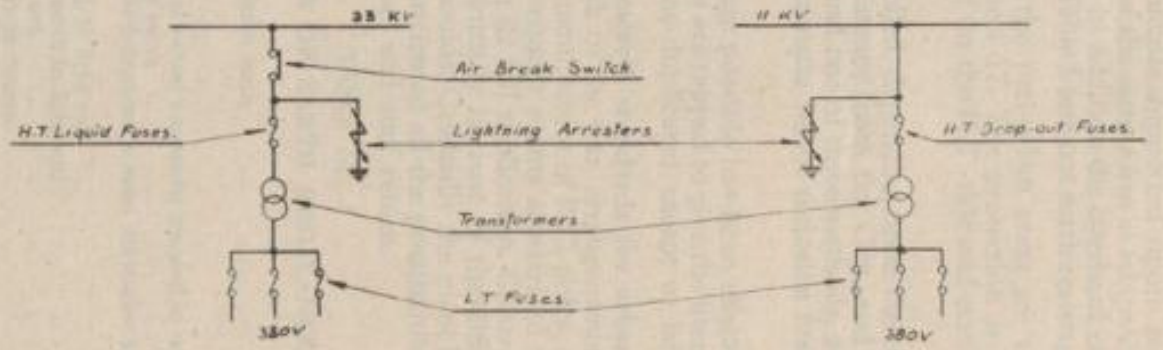



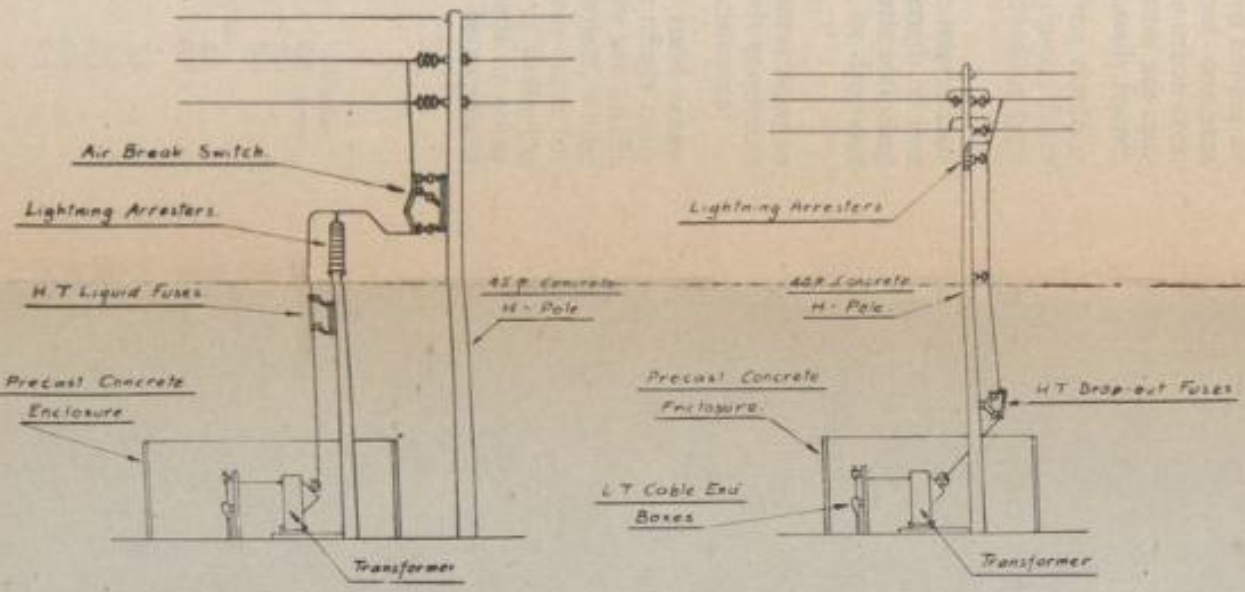

Scale: ¼" = 1 Foot.

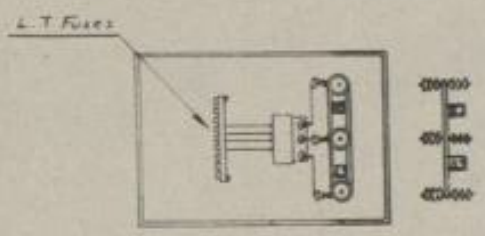
## Standard Substations, Urban Designs.

Sheet 16.

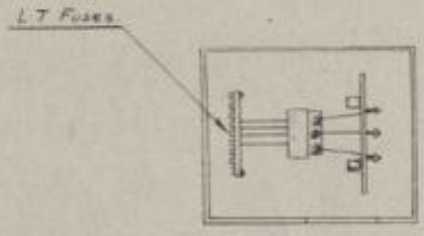
3450 O.T.




33 KV.




11 KV.

Scale: $\frac{1}{8}$" = 1 Foot.

## Standard Substations, Rural Design.

Sheet 17.

3451 Q.T.

The house services both underground and overhead 3 phase and single phase as demanded. It is intended, in the peri-urban and rural areas, to standardise upon auto-earth leakage switches to overcome the difficulties attendant upon relatively high earth resistances in the dry season.

5.20 **Rural.** 33 kv. and 11 kv. overhead construction has been standardised as shown in Sheets 15 & 17, using steel-cored copper or copper cored steel conductors supported upon reinforced concrete standards. L.T. lines are of the same form as adopted in the urban area. Each pole is earthed, and in addition the overhead earth wires are connected to special earths. Table 5 sets out earth resistances usually found.

Substations outside the peri-urban areas are all of the outdoor type, as illustrated in Sheet 17. The protection is by drop-out fuses at the transforming point on the H.T. side and standard outdoor type L.T. fuses.

Spur lines are controlled, depending upon the relative importance of the feeder spur, its distance from the City, and the length of line to be protected by links and one of three methods, automatic reclosing outdoor oil switches, automatic 3-shot reclosing fusegear, or drop-out single shot fusegear.

Until the full coverage possible has been effected, connections to main 33 and 11 kv.feeders are tapped to give the immediately economic solution. Supplies are not duplicated except to large consumers.

5.30 **Reinforced concrete standards for urban and rural areas.** Just prior to the outbreak of the war, arrangements were nearly completed to commence the manufacture of R.C. poles, etc., for use on the distribution system. Subsequent events accelerated the project, whilst at the same time delaying its full application. Concrete cross-arms, for example, were not used initially because of the difficulty of designing and manufacturing the moulds. Gradually the plant has made up some of the leeway.It is not anticipated all the possibilities will be explored until after hostilities cease, and staff return.

TABLE No. 5

VALUES OF EARTH RESISTANCES

| | Value |
|---|---|
| **1. Urban area** | |
| Eastlea No. 1 substation main earth ... ... ... ... | 0.2 ohms |
| Eastlea No. 2 substation ... ... ... ... ... ... | 0.3 ,, |
| Kingsway substation ... ... ... ... ... ... | 0.1 ,, |
| The foregoing are typical values for earths coupled to water mains. | |
| Belvedere substation main earth ... ... ... ... ... | 2.2 ,, |
| Express Nut and Oil works (consumer's main substation earth) | 0.8 ,, |
| **2. Rural area** | |
| Substation 108 main earth in light soil ... ... ... ... | 3.5 ,, |
| Substation No. 109 main earth in light soil ... ... ... | 3.5 ,, |
| Substation No. 29 plant earth ... ... ... ... ... | 0.4 ,, |
| Substation No. 29 transformer neutral ... ... ... ... | 0.6 ,, |
| Substation No. 29 arresters (H.T.) ... ... ... ... | 0.4 ,, |
| (heavy red soil, marshy ground) | |
| Substation No. 167— | |
| Before rains ... ... ... ... ... ... ... | 9.0 ,, |
| After rains ... ... ... ... ... ... ... | 0.9 ,, |

The pilot plant erected within the Power Station grounds was intended to see the department through, and was located in its present position merely to centralise staff. Plans to transfer the activities elsewhere, with a properly laid out plant, have been approved.

Meantime, the usefulness of reinforced concrete standards and other products has been proved. Costs of steel and other items have risen, and give no fair comparison with pre-war costs. Nevertheless, there is no likelihood of steel competing with the types in use after normal conditions return. It is estimated the use of concrete has saved the Department some £100,000 over the period it has been in use.

As was expected, minor teething troubles have been experienced: their nature was not such as to cause any worry. Transport difficulties have been negligible, despite what we now know are somewhat unnecessarily clumsy handling arrangements. New designs for off-loading have been prepared and will shortly be in use, based upon experience gained. Some of the original designs of standards were on the conservative side, leading to rather heavy poles. It is now possible, however, to design to closer limits, and the weight of the heavier poles will be reduced when new designs are used. The whole project must therefore be viewed against the background of wartime difficulties and the lack of previous experience of this form of construction.

Contemplated street lighting improvements were suspended at the outbreak of hostilities. It was intended to utilise R.C. ornamental standards, the designs for which have been prepared. A small standard for special applications can be seen within the Power Station grounds.

The main products manufactured at the plant up to date are as follows:—

| Product | Length | Weight lbs. | No. |
|---|---|---|---|
| 33 kv. cross-arm poles ... ... ... | 45'0" | 3,600 | 456 |
| 33 kv. straight poles ... ... ... | 45'0" | 3,150 | 411 |
| 11 kv. cross-arm poles ... ... ... | 40'0" | 1,900 | 809 |
| 11 kv. straight poles ... ... ... | 40'0" | 1,800 | 505 |
| L.T. intermediate poles ... ... | 28'0" | 1,100 | 2,969 |
| L.T. terminal poles ... ... ... | 29'6" | 1,500 | 190 |
| Roof beams for Power Station ... | up to 14'8" | — | 1,286 |
| 10'...4' precast louvre sections for Power station and substations ... | — | — | 55 |
| 4'0"...3'6" precast cable tunnel... ... | — | — | 600 yds. |
| 12'0"...12'0" substation cages ... ... | — | — | 35 |
| Posts and standards ... ... ... | 3'0" to 15'0" | — | 16,720 |
| Sundry small products, slabs, cable ducts, cross-arms, water meter boxes, flower pots, etc. ... ... ... | — | — | 40,000 approx. |

## 6.00 DISTRIBUTION MAINTENANCE AND SERVICING

6.10 **Service facilities.** A 24-hour service is maintained for consumers' fault calls and for attending to distribution outages. Special faults vans and trucks have been designed and ordered to facilitate this work. The duties are of a normal nature: where faults appear to be of a major nature, staff on standby are called out to assist the faulstman.

The difficulties a large area of supply introduces, in servicing and fault elimination, can be readily appreciated. A call to reset an automatic reclosing breaker 20 miles from town may show up a fault and require immediate assistance by the faultsman, who is meantime not available for minor calls in town. Telephone facilities are not possible at all points, and on occasions, lightning troubles affecting the power supply in a district dislocate the communication system of the G.P.O.

It was clear early on, that the effective distribution of electricity and the maintenance of a high degree of continuity of supply to mining areas necessitated other means of communication. The matter was discussed at various times with the officials of the Department of Posts and Telegraphs. It was at first considered tapping post office lines would provide a solution. This was not favoured by the Post Office on account of the possible abuse and the demands for secrecy. The officials of the Engineering branch of the Post Office co-operated in the end in developing a two-way carrier system of communication for the remote areas, and a two-way radio telephone system for the urban areas. Appendix 1 details technical features of these systems. Wartime difficulties have delayed the completion of these, and the provision of all the equipment required, so that sufficient experience has not yet been gained to pass comment on the advantages. It is sufficient to record that the ultimate possibilities are expected to ease the difficulties presently experienced, to reduce the consumption of manpower, and to improve the reliability of the supply.

6.20 **Plant and equipment maintenance.** The development of supply over so large an area increased the problems of maintenance of plant and equipment. The speed with which the system has developed, and the attendant difficulties introduced by call-ups for war service, have precluded proper attention to much of the system. Reconstruction was abandoned temporarily as undesirable in wartime. The programme of maintenance laid down is as follows.

Preventive maintenance is being carried out on all distribution plant at present in service. This does not allow for re-conditioning, repair work or commissioning (on-load tap changing transformers, etc.), which would be required to bring substations up to 100% servicability in the first place.

The calculations for this maintenance are based on a three-year cycle, annual figures being derived as an average therefrom.

The maintenance cycle comprises:—
the monthly maintenance of O.L.T.C. transformers and regulators.
the yearly maintenance of transformers and switchgear.
the three-yearly reconditioning of transformer oil.

It is expected that, owing to weather conditions, filtering of transformer oils will be carried out mainly during the months of April to October, while the yearly maintenance of plant will largely take place between the months of November and March.

**Maintenance schedule.** Details of the maintenance to be carried out are laid down in the schedule set out in Appendix 4.

## APPENDIX No. 1

## DESCRIPTION OF THE COMMUNICATION SYSTEM DESIGNED AND INSTALLED BY THE ENGINEERING SECTION OF THE DEPARTMENT OF POSTS AND TELEGRAPHS FOR USE BY THE SALISBURY MUNICIPAL ELECTRICITY DEPARTMENT

The Salisbury Municipal wireless scheme is intended as a dual purpose system providing the following:—

(a) Communication with a fault truck, which might be anything up to forty miles from Salisbury and will generally cover such matters as cutting off or restoring power. This communication will invariably be undertaken with the truck stationary, in fact this is obligatory with the types of transceiver in use since the aerial mounting is an integral part of the carrying case which must therefore be placed on a tail board or running board in order to allow of unobstructed erection of the aerial.

(b) Communication with a patrol truck which might be anywhere in Salisbury or environs and probably not more than five miles from Wynne Street. The truck will generally be on the move hence the system must be an integral part of the truck and a "listening watch" must be kept in order to lose as little time as possible in notifying the crew of a breakdown or complaint.

As yet only that part outlined in (a) is in operation. Suitable equipment for (b) is not available but is on order, and is expected to arrive in the near future.

Very serious difficulties have been encountered in the full application of system (a). Although reliable communication up to the maximum distance (some forty miles) is obtainable during daylight the very great increase in noise level, approximately 30 decibles, obtaining after sunset reduces the reliable range to approximately fifteen miles, and this only with a very powerful (150 watts) transmitter run off an auxiliary petrol engine driven alternator. With the normal small transceivers the night range falls to eight or nine miles.

The wavelength chosen 144 metres is a compromise between various factors. Both the attenuation of the direct ray and the efficiency of a given aerial for transmission vary directly with the frequency or increase with the wave length, and the noise level varies inversely with the frequency or directly with the wavelength. The use of a high frequency, although satisfactory in daylight utilising the indirect or reflected ray, fails at night owing to "skip," i.e. insufficient bending in the ionised layer to deal with the necessarily high radiation angle required.

The various types of equipment are:—

(1) A headquarters set of about 40 watts carrier output feeding into a folded two quarters waves in series aerial giving essentially vertical poliarisation which favours the direct ray. The operation is "simplex," i.e., "talk" or "listen" in order to economise in the frequency spectrum required.

(2) Small transceivers with two six volt accumulators to give the twelve volts for the rotary converter supplying the four hundred volts high tension. The carrier output is from ten to twenty watts into a fifteen feet sectionalised rod working to earth. Operation is simplex and a hand microtelephone is used. The apparatus packed consists of the two 170 ampere hour batteries a tubular case for the aerial rods, and the transceiver occupying about 3 cubic feet, and weighing 50 lbs.

3) A high power transmitter with receiver, working off a petrol set supplying 110 volts A.C. The power output is approximately 150 watts into a 15 feet rod aerial. This equipment weighs 200 lbs for the transmitter receiver, and 170 lbs for the petrol set, occupies 7 cubic feet, and is obviously only of use in the case of a distant breakdown at night where a large truck could be used.
A solution to the difficulty of communictaion with a distant working party at night is being sought in the utilisation of carrier current working in the G.P.O. lines which in most cases closely parallel all power routes. This it is hoped will overcome the objection to the use of a carrier system tapped on the power lines with the element of risk for the personnel.

## APPENDIX No. 4

## COMPLETE DISTRIBUTION PLANT MAINTENANCE SCHEDULE (THREE-YEAR CYCLE)

### MONTHLY MAINTENANCE:

**On load tap changing transformers and regulators:**

Examine contact making voltmeter, clean contacts and adjust voltage. Check position indicator and indicating voltmeter: examine and clean time delay relays: electrical and manual operation of tapping changes. Record cyclometer readings. Examine breather on tap change tank. Check bus bar volts and consumer's voltage.

### YEARLY MAINTENANCE:

**Tap changing transformers:**

Filter or change oil in switch tank, overhaul tapping switches, overhaul all relay contacts: clean all operating mechanism: oil or grease all bearings of same: check wiring. General tighten-up of contacts and mechanism.

**Transformers:**

Check oil levels. Take oil samples from bottom of tank, flash test the sample. General tighten up of all glands, gaskets and connections. Clean all external bushings and examine for signs of fracture. Examine gauge glasses. Examine tapping switches and check operation with voltmeter: examine vent diaphragms: megger H.T. and L.T. windings. Examine H.T. and L.T. fuses and re-grade if necessary. Test transformer earth. Clean inside and outside of substations, and report on condition of paint work.

**Switchgear H.T. and L.T. switches:**

Tank to be lowered: switch contacts to be examined(cleaned, faced up or changed). All bushing and inside of tank to be cleaned; switch oil to be changed. Switch mechanism to be examined, cleaned and oiled. Relay operated switches with batteries: carry out electrical trip tests from relays: examine condition of tripping battery: H.T. switches which have tripped on fault on four occasions, tank to be lowered. contacts and oil to be examined (Test room change battery).

**Auto-reclosers and line switches:**

Tanks to be lowered: contacts faced up or changed: mechanism examined and cleaned: tanks cleaned out and oil changed.

### THREE-YEARLY MAINTENANCE:-

**Transformers:**

All transformers above 10 kva to be filtered on site: oil flash tests to be taken before and after filtering and logged on report sheet: transformer to be painted if necessary.

**Non-conservator type transformers:**

Top cover to be removed: examine for corrosion on under-side of cover: clean off all scale and corrosion and paint with oil resisting varnish: transformers up to 10 kva, drain off oil: flush with clean oil, top up with new oil, save time of filtering: paint cage if necessary.

**H.T. switchgear:**

Secondary injection tests and re-timing of relays.

**Maintenance sheets.** On completion of maintenance at each substation, the maintenance report sheet is returned to the office. One sheet covers general substation maintenance, while the other monthly inspections of O.L.T.C. and regulators.

**Record system.** The record system employed comprises a card index system of the Roneodex type, kept in the Distribution Department office.Each card is entered up after completion of maintenance work from the respective substation maintenance report sheets. These cards have colour signals attached, which enable the subhead to see at a glance which work has to be carried out monthly, annually or three-yearly.

TABLE No. 6

## ANALYSIS OF CONSUMER CONSUMPTION AND REVENUE FOR ALL SCALES YEAR 1943/1944

| Scale | Average No. of Consumers | Average Total Consumers | July-June 1943-1944 Units | July-June Total Units | July-June 1943-1944 Revenue | July-June 1943-1944 Total Revenue | Average cost per unit | | Average units per year per Consumer | Average units per year per Consumer Total | Average amount paid by each Consumer p.a. | Average amount paid by consumer per year Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A. | B. | C. | D. | E. | F. | E÷C | F÷D | C÷A | B÷D | E÷A | F÷B |
| A | 2,813 | | 13,336,825 | | £52,510 15 5 | | .945d | | 4,741 | | £18.672 | |
| A+H | 705 | | 2,702,265 | | 13,684 8 11 | | 1.215d | | 3,833 | | 19.416 | |
| A+I | 477 | | 1,688,203 | | 10,207 12 8 | | 1.451d | | 3,539 | | 21.396 | |
| | | 3,995 | | 17,727,293 | | £76,402 17 0 | | 1.034d | | 4,437 | | £19.128 |
| B | 825 | | 3,523,658 | | 24,089 2 9 | | 1.641d | | 4,271 | | 29.196 | |
| B+H | 20 | | 90,043 | | 756 0 7 | | 2.015d | | 4,502 | | 37.800 | |
| B+I | 14 | | 57,605 | | 400 9 9 | | 1.669d | | 4,144 | | 28.608 | |
| Total | | 859 | | 3,671,306 | | 25,245 13 1 | | 1.650d | | 4,273 | | 29.388 |
| C | 23 | | 1,125,861 | | 5,219 17 10 | | 1.113d | | 48,950 | | 226.956 | |
| C+I | 3 | | 24,131 | | 104 5 7 | | 1.037d | | 804 | | 34.764 | |
| Total | | 26 | | 1,149,992 | | 5,324 3 5 | | 1.111d | | 44,230 | | 204.780 |
| Da | 196 | | 2,055,394 | | 15,487 3 11 | | 1.808 | | 10,486 | | 79.020 | |
| Da+H | 13 | | 85,265 | | 798 17 2 | | 2.249 | | 6,558 | | 61.452 | |
| Da+I | 10 | | 154,153 | | 1,386 4 8 | | 2.158 | | 15,415 | | 138.624 | |
| Db | 1 | | 106,274 | | 365 12 3 | | .826 | | 106,273 | | 365.616 | |
| Db+H | 2 | | 128,755 | | 1,103 3 11 | | 2.056 | | 64,377 | | 551.604 | |
| Dc+H | 2 | | 76,008 | | 354 10 2 | | 1.120 | | 38,004 | | 177.252 | |
| Dc | 10 | | 1,498,757 | | 5,775 7 0 | | .925 | | 149,875 | | 577.536 | |
| Dc+I | 4 | | 456,675 | | 1,809 14 7 | | .951 | | 114,168 | | 452.436 | |
| Total | | 238 | | 4,561,281 | | 27,080 13 8 | | 1.425 | | 19,165 | | 113.784 |
| Eb | 6 | | 2,621,696 | | 6,593 13 4 | | .604 | | 436,949 | | 1,098.948 | |
| Eb+I | 2 | | 3,809,763 | | 9,482 19 9 | | .597 | | 1,904,881 | | 4,741.488 | |
| Total | | 8 | | 6,431,459 | | 16,076 13 1 | | .600 | | 803,932 | | 2,009.580 |
| Fa | 13 | | 291,496 | | 763 11 1 | | .629 | | 22,422 | | 58.740 | |
| Total | | 13 | | 291,496 | | 763 11 1 | | .629 | | 22,422 | | 58.740 |
| G | 14 | | 19,115 | | 516 17 5 | | 6.490 | | 1,365 | | 36.924 | |
| G+H | 1 | | 16 | | 15 1 | | 11.310 | | 15 | | .756 | |
| G+I | 2 | | 3,413 | | 100 0 3 | | 7.033 | | 1,706 | | 50.004 | |
| Total | | 17 | | 22,544 | | 617 12 9 | | 6.575 | | 1,326 | | 36.336 |
| TOTAL | | 5,156 | | 33,855,371 | | £151,511 4 1 | | 1.074 | | 6,566 | | 29.388 |

## 7.00 CONSUMER DEMANDS AND CONSUMPTION

The consumer groupings are as follows:—

| Scale | Class of consumer | Type of load |
|---|---|---|
| A | Domestic urban area | All classes of domestic appliance plus lighting |
| B | Commercial urban area | Office lighting and office equipment |
| C | Licensed premises, clubs, theatres, etc. | Lighting and associated equipment supplies |
| D | Motive power up to 100 kw. urban area | All classes of light industrial requirements |
| E | Ditto, over 100 kw. urban area | All types of heavy industries, mining, special consumers, etc. |
| F | Water heating, air-conditioning, etc. | Special tariff for off-peak supplies, etc. |
| G | Lighting and temporary | Lighting scale |
| H | All peri-urban suburbs incorporates a surcharge on all foregoing classes | All foregoing types |
| I | All rural incorporates a surcharge on the relevant urban scale | All foregoing types |

TABLE No. 7

| Year | Sales of energy per annum | No. of consumers | Revenue per consumer per annum |
|---|---|---|---|
| 1933/34 | £52,853 | 2,236 | £23.65 |
| 1934/35 | 55,315 | 2,258 | 24.50 |
| 1935/36 | 70,103 | 2,857 | 24.52 |
| 1936/37 | 85,924 | 3,166 | 27.2 |
| 1937/38 | 88,840 | 3,496 | 25.4 |
| 1938/39 | 106,230 | 3,822 | 27.8 |
| 1939/40 | 127,442 | 4,263 | 29.9 |
| 1940/41 | 147,076 | 4,535 | 32.4 |
| 1941/42 | 162,122 | 4,828 | 33.6 |
| 1942/43 | 175,945 | 5,100 | 34.5 |
| 1943/44 | 191,555 | 4,396 | 35.5 |

Table No. 6 analyses the revenue per scale. Over the period of the last ten years, the average price per unit sold has dropped from 2.14d. to 0.962d.

Table No. 7 following details the growth in the sales of energy from 1934 onwards, and the corresponding revenue per consumer.

Rural farming loads average 6.5 to 10 kws. per consumer. These demands do not coincide with the undertaking's winter peak. No tobacco curing has as yet been commenced. It is anticipated this will increase the total rural average demand to 7.5 kws. per consumer. The average individual rural demand will then be as high as 150 kws.

The R.A.T.G. camps were equipped with all electric water heating and cooking facilities. The kw. loading of a representative camp is as follows:—

| | | |
|---|---|---|
| **Airmen's Mess, load** | | 265 kws. |
| Cooking | 230 kws. | |
| Water heating | 29 ,, | |
| Lighting | 6 ,, | |
| **Sergeants' Mess, load** | | 100 kws. |
| Soup boiler | 7.6 kws. | |
| Fish fryer | 7.0 ,, | |
| Range | 30.0 ,, | |
| Grilles | 5.0 ,, | |
| Urns | 9.0 ,, | |
| Warming oven | 10.4 ,, | |
| Steam oven | 12.0 ,, | |
| Roasting oven | 5.0 ,, | |
| Water heating | 9.0 ,, | |
| Lighting | 5.0 ,, | |
| **Officers' Mess, load** | | 94 kws. |
| Cooking | 76 kws. | |
| Water heating | 12 ,, | |
| Lighting | 6 ,, | |
| **Ablution blocks, load** | | 294 kws. |
| 250 gallon water heater | | |
| 150 ,, ,, ,, | | |
| 120 ,, ,, ,, | | |
| 60 ,, ,, ,, | | |
| And smaller units | | |

Air Force housing schemes were fully equipped as follows:—

| | |
|---|---|
| Cooker | 6.0 kws. |
| Water heater | 2.5 ,, |
| Radiator | 1.0 ,, |
| Kettle | 0.75 ,, |
| Iron | 0.45 ,, |
| Refrigerator | 0.25 ,, |
| Lighting | 0.6 ,, |
| | 11.55 ,, |

The substation loading in a residential area averages the following:

| Substation | Summer M.D. | | Winter M.D. | | No. of Consumers | Units sent out per month | |
|---|---|---|---|---|---|---|---|
| | Total | Per Consumer | Total | Per Consumer | | Summer | Winter |
| Bronte | 292.5 | 1.43 | 430 | 2.1 | 204 | 63,800 | 105,908 |
| Mazoe | 132.75 | 1.05 | 211 | 1.67 | 126 | 33,540 | 07,518 |
| Blakiston | 204 | 1.08 | 340.6 | 1.81 | 188 | 49,740 | 58,268 |

## 8.00 GENERATING PLANT

During the last ten years the installed plant has been increased in accordance with the particulars set out in Table No. 8.

TABLE No. 8

| Year | M.D. recorded | Total Installed capacity | | Units added | |
|---|---|---|---|---|---|
| | | Genl plant | Steam raising plant | Generating | Steam raising |
| 1934 | 2,175 | 6,000 kws. | 55,000 lbs. p.h. | 1-3,000 kw. | 1-22-000 lbs/hr. |
| 1935 | 2,700 | 6,000 ,, | 55,000 ,, | — | — |
| 1936 | 3,900 | 6,000 ,, | 55,000 ,, | — | — |
| 1937 | 4,650 | 6,000 ,, | 55,000 ,, | — | — |
| 1938 | 6,200 | 13,500 ,, | 111,500 ,, | 1-7,500 kw. | 1-50/60,000 lbs/hr. |
| 1939 | 8,050 | 13,500 ,, | 111,500 ,, | — | — |
| 1940 | 9,200 | 13,500 ,, | 207,500 ,, | — | 1-50/60,000 lbs/hr. 2 accumulator shells |
| 1941 | 10,600 | 13,500 ,, | 300,000 ,, | — | — |
| 1942 | 12,000 | 18,500 ,, | 300,000 ,, | 1-5000, kw. | 1-50/60,000 lbs/hr. 2 accumulator shells |
| 1943 | 13,300 | 23,500 ,, | 300,000 ,, | 1-5,000 kw. | — |
| 1944 | 14,200 | 23,500 ,, | 300,000 ,, | — | — |

The high rate of increase of demand on plant, already referred to, caused a decision to be taken in 1939 to augment the capacity of the plant by commencing a new station, known as Power Station No. 2, designed for an ultimate capacity of 65,000 kws., to be operated in parallel with Power Station No. 1. The essential features of the plants follow conventional designs, with the exception of Power Station No. 1. In this case, the demand for low capital outlay plus the advantages normal to a steam accumulator system, resulted in the installation of two mixed pressure turbines and a steam storage system. One existing turbine was converted to mixed pressure operation. The main particulars of this plant are:—

Peak rate of discharge of accumulators ... ... 5,000 kws.
Time over which peak rate can be sustained ... 1 hour
Maximum storage of accumulators in kwhrs. ... 5,500

The plant was designed for a peak with a time base of 3 hours, rising from zero to 2,500 kws. on stored steam in 1 hours, remaining at this figure for 1 hour and falling thereafter to zero in 1 hour.

Unfortunately shortage of personnel, and a large number of changes in operating staff as a result of call-ups for service, have precluded the complete testing of the plant. It has given trouble-free service, and fully lived up to the advantages claimed. In several power station plant breakdowns, it has been invaluable in speeding up the restoration of supply. Its disadvantage, compared with a boiler under steam, of not being able to give an output when discharged, has not been felt. The reason is that the need for extra steam, should a breakdown occur when discharged, coincides with off-peak conditions of load, hence there is then ample boiler plant available. The simplicity of operation has enabled the staff to handle the equipment without difficulty. Rough

tests taken with and without the accumulators in service have confirmed the savings in coal consumption anticipated. A full report upon the performance will be the subject of a special paper after the war.

The main generation voltage is 11,000. A 33,000 volt step-up substation within the Power Station grounds is contemplated for future construction, to which existing separate radial 33,000 volt feeders will be connected.

The statistics published under aegis of the Association details all relevant annual operating results of the undertaking. It is considered a sub-committee of the Association should review the form in which these are published, and endeavour to frame them differently. There appears to be a need to co-ordinate the results, and to reduce them to common bases, e.g., load factor, price of coal, water costs, % of spare plant, etc. The resulting figure of merit should form the basis for a fine competitive motive amongst undertakings. It is true the results can be worked out individually, but only by the technical officers. On the financial side, particularly in regard to the capital outlay, amounts written off, etc., a clearer indication of the requirements would greatly assist undertakings, and be of general assistance. Until these standards have been settled, it is felt the publication of the bare operating results are not as useful as they might be.

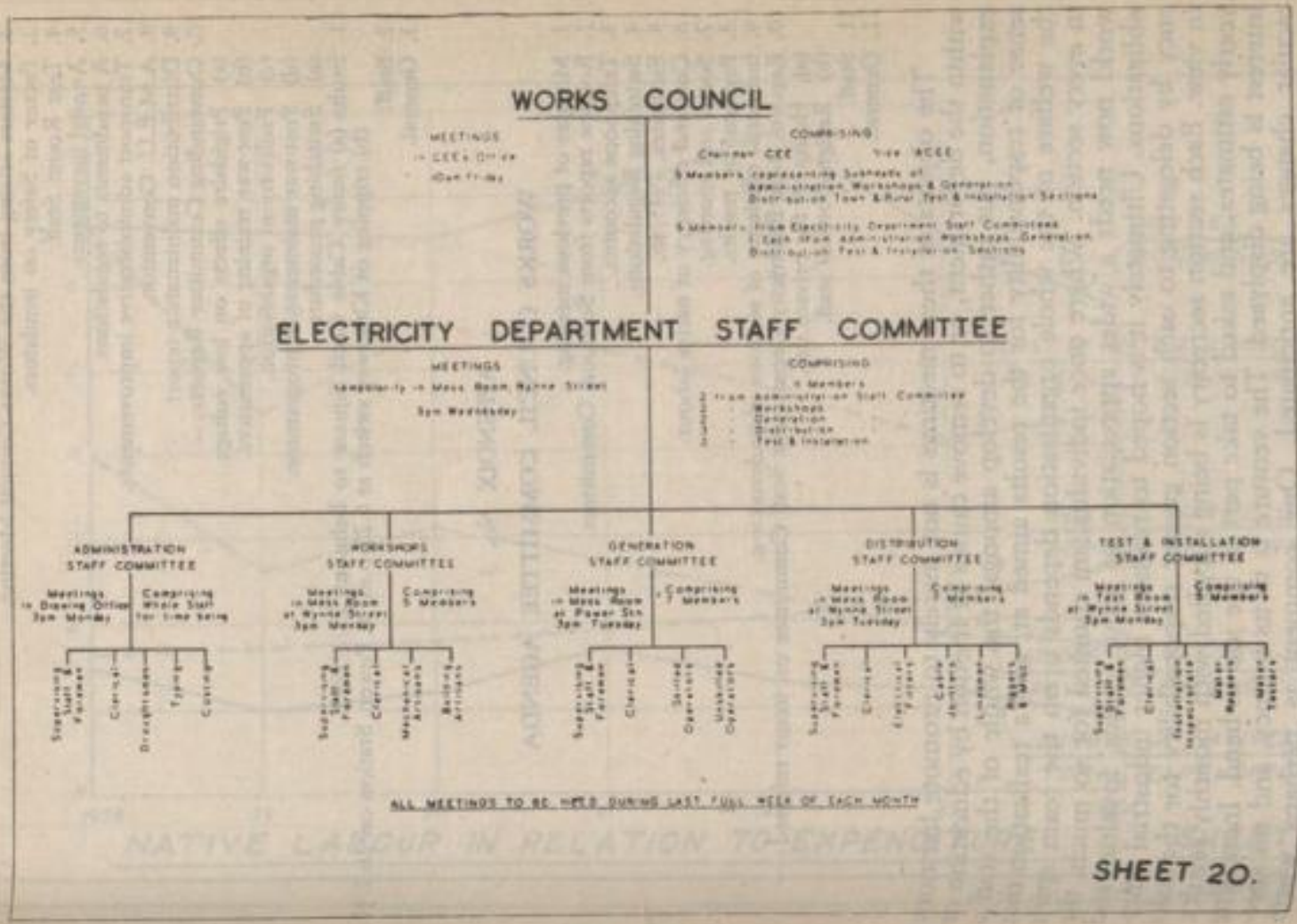
## 9.00 STAFF INDUSTRIAL RELATIONS

No record of the development of an undertaking can be complete without a survey of the development of the relationship between management, staff and output. In these days, the dominating question when war ends appear to be full employment, social security and good industrial relations. Forgotten, apparently, is the greater problem of increasing the output per manhour. Everyone is busy dividing the cake into more equal slices—a few are wondering who is to make the cake larger so that what is the ultimate desire, a fuller life for all, may be realised.

There is no more inaccurate cliché than that there is starvation in a world of plenty. The world is a poor place, and it behoves us to do our share to increase the productivity of our industry.

In developing the department, one step to encourage the team spirit and co-ordinate efforts was the formation of a Committee of Management, which meets regularly, and comprises all subheads and senior foremen of all departments. A sample agenda is shown in Appendix 2. Regular minutes. etc., are kept, and all members discuss freely the matters of the momnt.

The next step was the formation of a Works Council for the department. Each section of the undertaking (as shown on the diagram in Sheet 20) has its own committee which, through a central staff committee, elects two members to the Works Council, at which all sub-heads are present. A sample agenda is set out in Appendix 3. All meetings are held in office hours.


WORKS COUNCIL
MEETINGS
COMPRISING
ELECTRICITY DEPARTMENT STAFF COMMITTEE
MEETINGS
COMPRISING
ADMINISTRATION STAFF COMMITTEE
WORKSHOPS STAFF COMMITTEE
GENERATION STAFF COMMITTEE
DISTRIBUTION STAFF COMMITTEE
TEST & INSTALLATION STAFF COMMITTEE
ALL MEETINGS TO BE HELD DURING LAST FULL WEEK OF EACH MONTH

SHEET 20.

APPENDIX No. 2

## COMMITTEE OF MANAGEMENT AGENDA

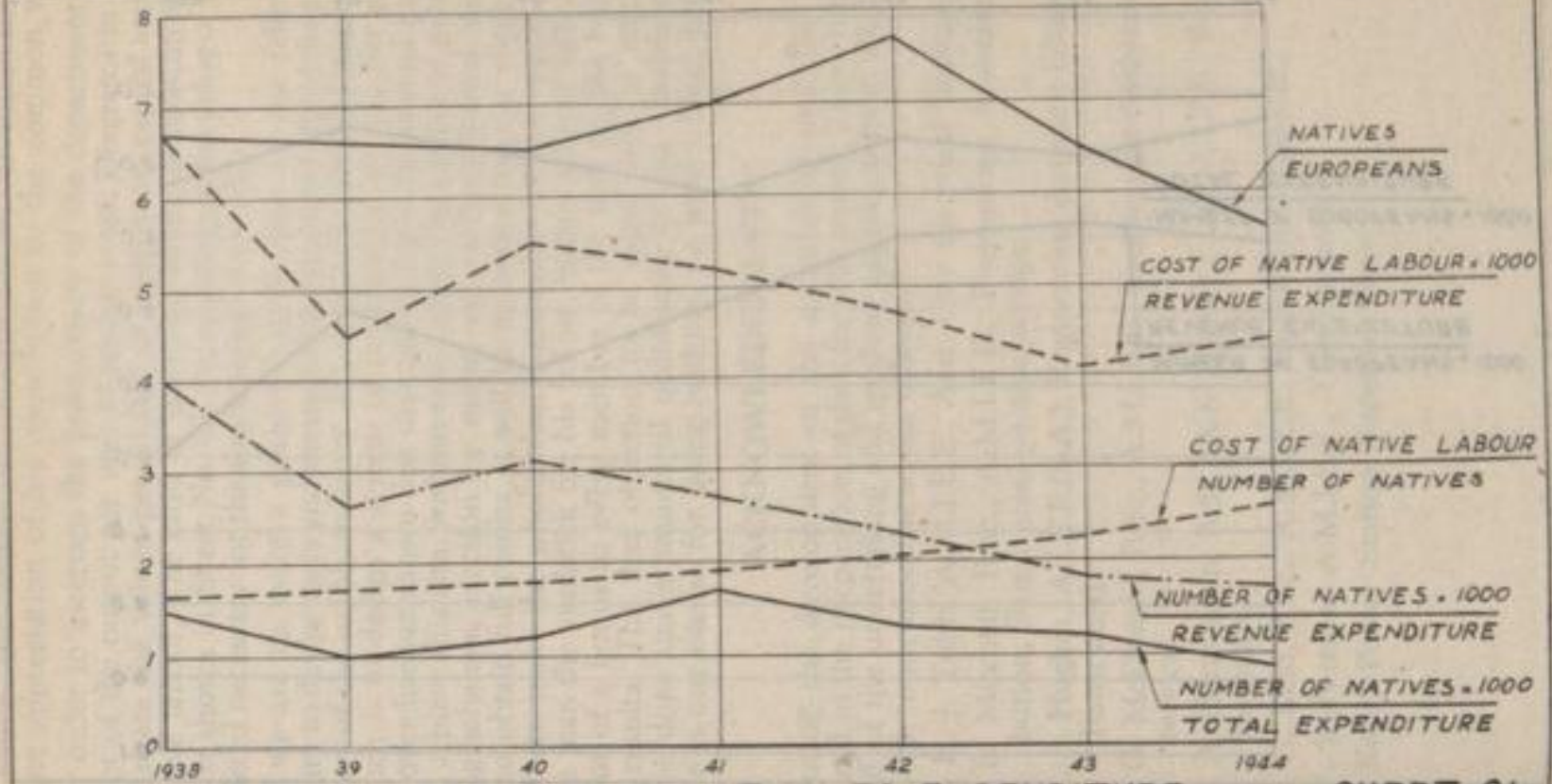
1. Minutes of previous meeting and matters arising therefrom.
2. Matters arising from the Works Council Meeting.
3. Factor of Safety on insulators.
4. Test Room Staff.
5. Annual increments.
6. A nendments to regulations.
7. Transport administrative improvements.
8. A.M.E.U. Convention.
9. Distribution maintenance report.
10. Outstanding Committee Reports:—
    (a) Frigidaire effects on low voltage.
    (b) Post-war training of apprentices.
    (c) Faults-room organisation.
    (d) Post-war maintenance programme.
    (e) Switching procedure.
11. Faults (a) faulty Cable Cecil Square to Belmont 25/2/1945.
    (b) tripping of Kingsway switch at 6.25 p.m. at Power Station on 26/2/45.
12. Staff.
13. General.

APPENDIX No. 3

## WORKS COUNCIL COMMITTEE AGENDA

1. Minutes of previous meeting.
2. Routine reports from Sectional Committees.
3. Telephone accounts.
4. Switching Regulations.
5. Estimates, 1945/46.
6. Cost and efficiency of native labour.
7. Social and sporting.
8. Payment by results.
9. Industrial efficiency of sections of undertaking.
10. Reports from Electricity Department Staff Committee on items referred:—
    (a) Hours off for private use.
    (b) Resignations of staff.
11. Staff.
12. General.

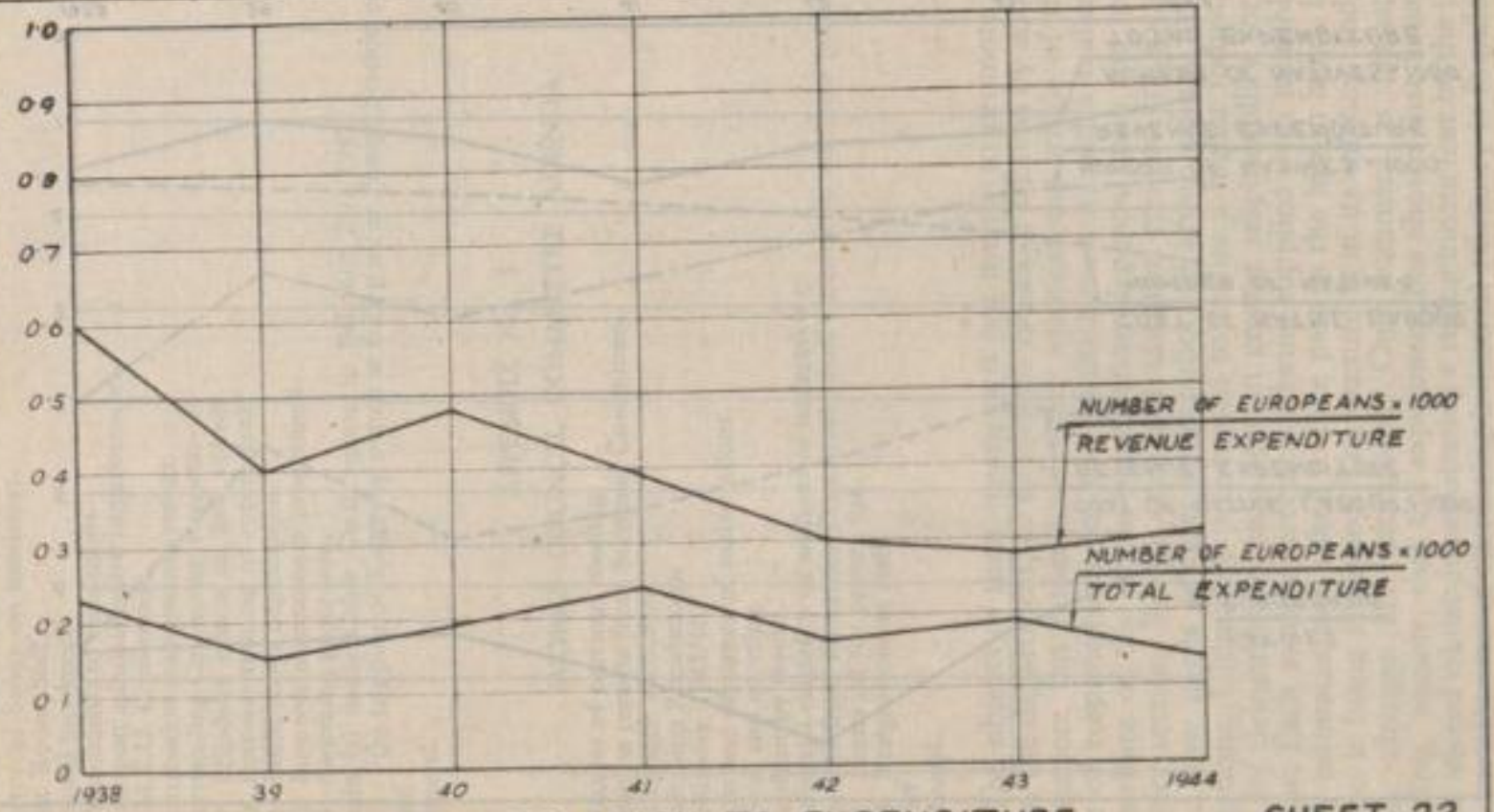
The objects of these meetings is not merely to promote harmony within the department, or to remove causes of friction by education or explanation, but rather to develop amongst the whole of the staff a sense of responsibility for the results aimed at, and a realisation that the welfare of the whole organisation depends upon the team spirit in every section. Where once individualism counted for so much, the world now needs a wider appreciation of group ethics, loyalties and obligations. Ultimately it is hoped to realise a higher industrial efficiency by delegating to each section greater responsibility for the tasks in view. Each section secretary is being supplied with monthly results, yearly estimates, and asked to take part in the job in hand. Increasing interest is being displyaed. The venture is in its infancy, and no spectacular changes are anticipated. One comment is perhaps worth recording, namely, that the experiment has shown that latent interest can be stirred whilst demonstrating a ruling innate fear by the individual that the objective of increasing industrial efficiency is founded upon a desire to depress, in some obscure way, the plight of the working man.




NATIVE LABOUR IN RELATION TO EXPENDITURE.

SHEET 21.

3467 F.T.




EUROPEAN LABOUR IN RELATION TO EXPENDITURE.

SHEET 22.

3468 F.T.

For the cause of this unfortunate outlook, past policies over a century are to blame. The heritage of man demands we develop in the lowliest a proper appreciation of his contribution to the common weal.

In order to ascertain the productivity of the department, records are kept of the output per unit of labour costs. Diagrams in Sheet 21 demonstrate the values per £1,000 of output on capital and revenue for native labour. The ratio of european labour in relation to expenditure is shown in Sheet No. 22. No equating of the value of the £ was considered necessary for the short period covered.

If we are to make a positive contribution to our fellows, it is necessary to devise ways and means to increase still further the industrial efficiency of the supply industry. Every move to this end must be used. One such is to design a system of payment by results. No group the world over has yet shown that disinterestedness in personal gain necessary to achieve this aim, without resorting to the motive of private gain. Grading schemes, election by merit, etc., achieve partial success. In order to obtain full results, it will be necessary for the whole team to benefit—to make the whole team responsible for the results, and the average man the yardstick for his fellow. Such a scheme will mean the payment of a bonus to every member of the staff on the basis of the year's results. The first objection to be raised will be academic. It can't be done under municipal ordinances. If this "noble negative" attitude is our excuse for doing nothing, we have a bleak future.

## ACKNOWLEDGMENTS

During the development of the undertaking over the past ten years, and in the preparation of data for this record, I have relied upon the staff of the undertaking and received assistance from all. In particular I wish to mention the senior officers:—

B. H. J. Tubb, A.M.I.E.E., Asst. City Electrical Engineer.

J. E. Mitchell, B.Sc., A.M.I.E.E., Engineering Assistant (Distribution, Rural area)—active service.

St. S. Hughes, A.I.E.E.(S.A.), Engineering Assistant (Distribution, Town area).

F. G. McDonald, B.Sc., A.M.I.E.E., Engineering Assistant—active service.

R. A. Hermanson, B.Sc., A.M.I.Mech.E., A.M.I.E.E., Engineering Assistant.

R. G. Reid, B.Sc., A.M.I.E.E., Engineering Assistant.

W. Robertson, A.M.I.E.E., Test Engineer.

J. Kohr, Power Station Superintendent.

**The President:** In regard to curing of tobacco, I would mention that I have been busy collecting information on the subject of curing tobacco by the use of electricity for heating and so on, and the matter has reached a stage where I am about to recommend to my Council that an experimental plant be set up, either with the co-operation of the Department of Agriculture or through the Tobacco Research Association.

The conclusions we have come to are that all problems can be satisfactorily solved. The design is somewhat different from that which some of you have seen. The cost, or captial outlay, taking everything into consideration, is not so very different. The total cost of curing, per pound of leaf, by electricity would seem to be in the region of 1.5 pence per pound, and under present methods it would seem to be in the order of 1.1 pence, so there is a slight disadvantage against electricity; but there are other advantages which would counter-balance that. I am advised that if the tobacco industry is to expand there is insufficient wood in the country. The alternative would be either coal or oil fired boilers, and in that case electricity would be superior and cheaper.

The paper is now open for discussion.

**Mr. Eastman:** Gentlemen: We must congratulate our President on this paper which he has presented to us. Earlier in the proceedings I mentioned the contributions he had made to the work of our Convention in the shape of papers which in their way had become classics, and I venture to suggest that we have again had a classic presented to us. (Hear, hear.) He has described his undertaking in a way which will be of immense interest to us, whether we represent larger or smaller Undertakings.

Mr. Clinton's paper contains so much "meat" that it is difficult for us—for myself anyway—to offer anything of value in the way of comment without further study. And so I propose to submit my contribution to the paper in a written form as soon as possible. My reason for getting up now is simply to congratulate him—and I think I may do so on your behalf (Hear, hear)—for the very excellent paper he has read, and to draw attention to the fact that right through the paper we find Mr. Clinton to be a pioneer in a number of directions, and in regard to things which we ourselves perhaps have been rather chary of trying out. For instance, concrete poles. I think probably no Municipal Electrical Engineer in this country has had more experience and has been bolder in the design and manufacture of concrete poles than Mr. Clinton. Investigations in Cape Town have shewn that concrete poles are much more expensive to instal than steel ones, mainly due to the high cost of our unskilled labour. But Mr. Clinton is also a pioneer in the use of steam accumulators in Municipal Power Stations. We are very glad to note that the figures he gave us ten years ago, when he was first designing that arrangement, have been proved to be correct in practice. And if I may mention a third venture for which he is responsible, it is in actively interesting the local agriculturists in the curing of tobacco leaf electrically.

There is just one further item to which I would refer, namely the Works Council and Management Committee that he has introduced. That I think is something really new, and I would like to hear Mr. Clinton enlarge on that when he replies to the discussion.

Mr. President, I take it upon myself to tender to you the sincere thanks of the Convention for your most interesting and informative paper. (Applause.)

**Communicated:**

**Mr. Eastman:**

**Earth Leakage Protection:** I was interested to see that it is intended to standardise upon auto-earth leakage switches in the peri-urban and rural areas where relatively high earth resistances obtain in the dry season. Tests made by the Cape Town Electricity Department in outlying parts of the area of supply in the Cape Peninsula revealed that during the dry season it was physically impossible to obtain a satisfactory earth having a resistance low enough to cause apparatus as sensitive even as earth leakage switches to operate. The tests carried out in sandy soil shewed that extraordinary variations in the earth/earth electrode resistance occurred with the change in the seasons. These ranged from 154 ohms for a 1 inch galvanised iron pipe buried 8 feet deep in ground made damp by heavy rains, to 5333 ohms in dry ground in the summer for the same size and type of pipe buried 4 feet deep. The corresponding variation for a ¾ inch galvanised iron pipe under the same conditions and in the same soil was from 580 to 1600 ohms.

In view of the results of these tests the Cape Town Electricity Department has had no alternative, in areas where no other means of obtaining a satisfactory earth exists, but to insist that the exposed metal work of all installations be earthed to the neutral conductor of the distribution network in accordance with the M.E.N. system. Where this is done a label is attached to the main distribution board marked "Earthed to Neutral".

**Poles for Overhead Lines:** The use of concrete poles in Salisbury is very interesting to us at the Cape where steel poles for both low and high tension overhead lines are used for permanent supplies to the exculsion of any other type. The advantage of concrete over steel poles in Rhodesia exists by reason of the lower cost of production and also the lower cost of transport to and handling at the site of erection. This must obviously arise from the very much lower cost of unskilled labour available for this purpose in Rhodesia than is obtainable under wage conditions such as those prevailing in Cape Town. Estimates made during 1944 of the cost of using tubular concrete poles of South African manufacture as compared with the cost of steel poles shewed that, whereas the delivered price of the former was less than two-thirds of the price of corresponding steel poles, the total erected cost of a concrete pole, owing to its greater weight which entailed greater handling and transport costs, would exceed that of the steel pole by 12.5 per cent.

**Wireless Communication System for Service Vehicles:** The application of wireless communication systems to fault patrol trucks or vans specially fitted out to deal with supply outages or consumers' service calls presents interesting possibilities in a wide-spread area of supply.

The Cape Town Electricity Undertaking has not found it necessary to introduce such a system as yet because it possesses a comprehensive private telephone system, independent of the General Post Office system, which links up all sub-stations with the main district service depots. It is an underground telephone cable system which was inaugurated many years ago when the principle was adopted of laying telephone cables with all new E.H.T. power cables for supplying the various sub-stations.

It is the duty of service personnel when they have attended to a fault to proceed to the nearest sub-station, which is seldom more than ½ mile away, and ring up their main depot for further instructions. In isolated cases telephone instruments are connected to private exchanges at the main depots by means of twin telephone conductors suspended from the poles of the overhead reticulation system.

**Mr. Phillips:** Mr. President and Gentlemen: I would like to add my thanks and my congratulations for the excellent survey of the progress of the local Electrical Undertaking which has taken place during the period covered by the paper, and it would appear from your remarks, Mr. President, that with the application of electricity to tobacco curing there will be a considerable increase in consumption in the not distant future. I had not intended to speak on this paper, Mr. President, because whatever I had to say, would be more or less in the nature of a comparison between the Bulawayo and Salisbury methods (Laughter) and, moreover, it would be rather anticipating Mr. Sibson's Paper which will be read in Bulawayo. Further, I must confess that I find it difficult with all the hay I have at present on my fork to get down to a detailed study of the paper. The only remark I have to make is regarding the Works Council which has been inaugurated at Salisbury. We at Bulawayo have not yet found a Works Council necessary, and probably others have not; but nevertheless it is of great interest and we would like to know more about it.

**Mr. Gripper:** With reference to the high tension distribution system, there is an indication that single phase fusing is used on spur lines to farms, and I should like to know if those are farms which take a three phase supply, and if any trouble has been experienced from that condition.

I notice in regard to the 11 kV hexagonal areas that we have several step-down points from 33 kV to 380, and I would like to know whether those are considered to be of a temporary nature, or whether they only apply in isolated cases, because presumably the 33 kV will feed each hexagonal 11 kV area, and there will be no low tension distribution, except from 11 kV.

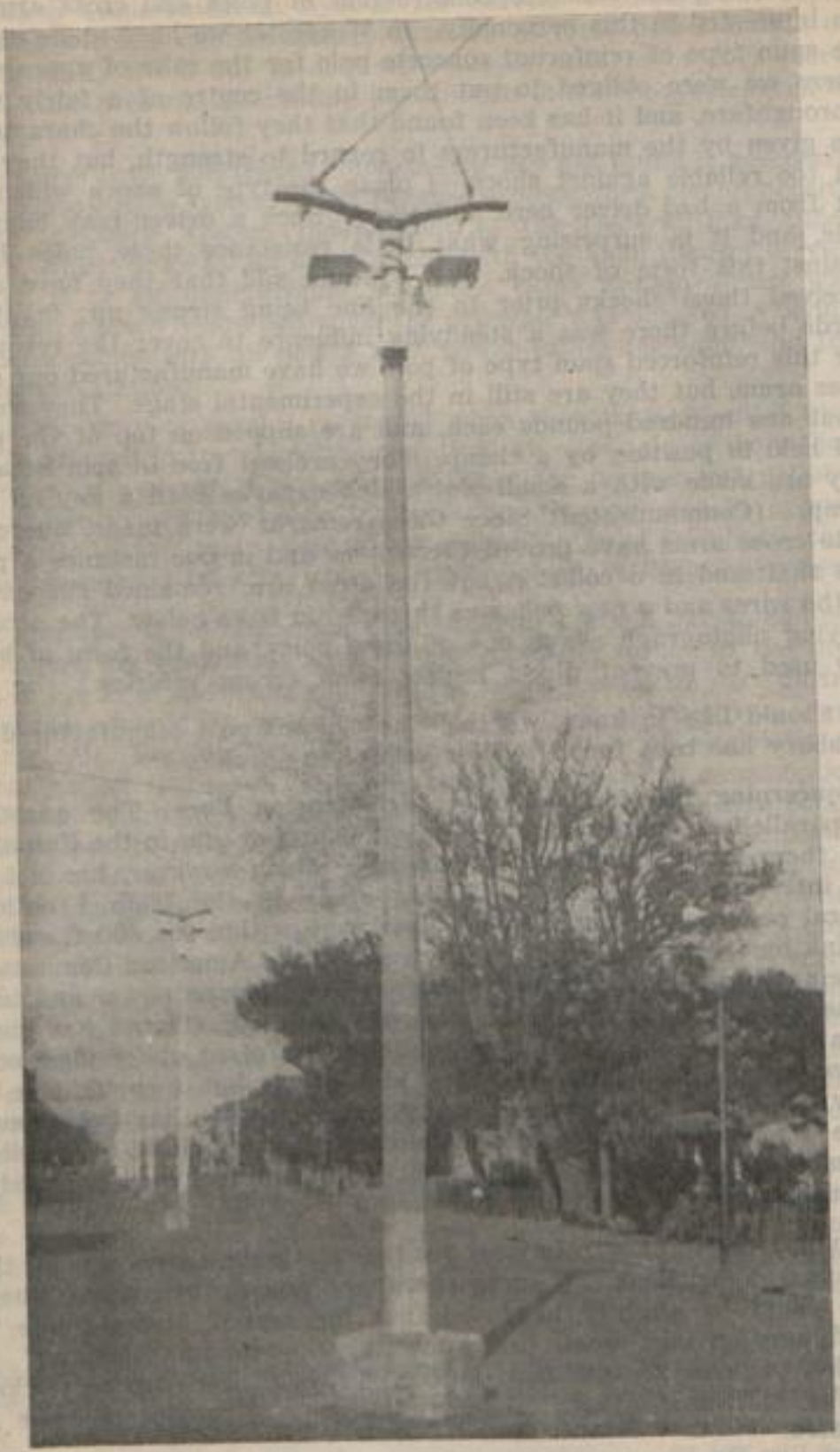
Concerning the concrete construction of poles and cross arms, I am interested in this personally. In Worcester we have made use of the spun type of reinforced concrete pole for the sake of appearance where we were obliged to put them in the centre of a fairly wide thoroughfare, and it has been found that they follow the characteristics given by the manufacturers in regard to strength, but they are not too reliable against shock—I mean the type of shock which we get from a bad driver here and there. Such a driver may bump a pole, and it is surprising what little resistance these poles have against this form of shock. But I would add that they have only received those shocks prior to the line being strung up: in other words before there was a steadying influence to cover the rebound. For this reinforced spun type of pole we have manufactured our own cross arms, but they are still in the experimental stage. They weigh about one hundred pounds each, and are slipped on top of the pole and held in position by a clamp. They are not free to spin because they are made with a small slot which engages with a key on the clamp. **(Communicated:** Since these remarks were made, our concrete cross arms have proved themselves and in one instance a pole was shattered in a collision but the cross arm remained suspended by the wires and a new pole was threaded in from below. The accompanying photograph shews one of these poles, and the form of base now used to prevent direct impact from erring vehicles.)

I should like to know whether the type of pole manufactured in Salisbury has been found to be resistant to shock.

**Concerning interference from high tension lines:** The question of "parallelism" was given a great deal of prominence in the Union, in fact there is an Interference Committee, which however, has not so far interfered very much! Coming along in the train I noticed several cases where high tension lines were within the 600 ft. which I think has been considered, at any rate by the American Committee, as being the limit of proximity between high tension power and telephone lines. The maintenance records which Mr. Clinton has given us in his paper—the method maintaining the plant under ideal conditions with a full staff—are very interesting but I should like to know whether the keeping of maintenance records has been found to be a job which can be undertaken by a female clerk, or possibly a disabled man and, if so, just what degree of technical knowledge is usually expected of such individuals.

Finally, there is a reference to the statistics given us in the Municipal Year Book. I agree there are one or two cases where these could be slightly improved, but for myself I would like to see figures giving "cost per kilowatt of maximum demand" in addition to "cost per kW installed." This, of course, can be worked out for individual cases, but it would be very useful to have it tabulated.

In conclusion, I would add my mede of appreciation to Mr. Clinton for his very interesting paper.

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**Mr. Powell:** I also would like to join the chorus of praise and thanks to our President for his very valuable contribution: it has given me great pleasure indeed in reading it. Whilst not wishing in the least to steal any laurels from Mr. Clinton, I think it would be correct to say that one of the foundations of the success achieved in pioneering many of the ventures in his electricity undertaking has been due to the possession of an extraordinary large and effiecient staff. And I would like Council Members in particular to note that it is only by having such a staff that it is possible to carry out investigation work, and to pioneer many of these efforts in an undertaking such as is to be found here in Salisbury.

I think one of the most interesting features in this paper is that connected with the rural load. It appears that this city will have one of the largest rural areas in the country, and this, of course, opens up the field of policy as to whether municipalities should undertake this duty of suppiying rural areas at long distances away from the source of supply, or whether it should be left to commissions or other authorities situated in the country in which the town is located. I would, therefore, like to know from Mr. Clinton whether he has kept special accounts of his rural area developments—that is, special revenue accounts—so that they are able to state definitely that rural development is of benefit to the city, or whether the city is in effect subsidizing the rural development. I feel in some ways that it is not right for the town to subsidize rural consumers. It is the duty of the State to carry that burden especially in countries like the Union and Rhodesia where one town has no chance of rural development because of local circumstances, and another town has the chance of very extensive development.

It has been pointed out that Mr. Clinton is a pioneer of reinforced concrete on poles for overhead lines, and I congratulate him on the work done in this connection, but have concrete poles any real advantage over wooden poles? Surely wooden poles at the price we can obtain them to-day, say, around 30/-, have every advantage over concrete poles, and especially to-day when we know the Forestry Department can give us a guaranteed 20 years' life, when the poles are properly impregnated.

One other point, and that is in regard to the use of steam accumulators. I have not studied this matter, but I cannot see that with the average undertaking to-day, which has a fairly even load curve levelled up by the effect of diversity, that the accumulator has any advantage over stand-by boilers. We most of us have to instal spare boilers, and it seems to me that these could be used for the peak and also to cover the necessary stand-by.

In conclusion, I would just refer to the staff again, and I sincerely congratulate Mr. Clinton in being able to persuade his Council to give him such an efficient staff, because without that staff it is, of course, impossible for any Engineer to be able to carry out the sort of work which Mr. Clinton has performed with such distinction. (Hear, hear.)

**Councillor Ferry:** Mr. President and Gentlemen,—I also must congratulate our President, particularly on certain features of his paper. I noticed that the estimated rate of growth of the load is now at 5,000 kilowatts per annum and later the figure is 10,000. That certainly indicates a bold outlook and it is very commendable. I should like to compliment him too on the large consumption per consumer. Presumably you have a relatively large number of industrial consumers.

There is also another point: whether Salisbury has considered the introduction of a system of awards for suggestions and improvements in this department. I might mention that quite recently in Cape Town one of the fitters, in consultation with the head of one particular department—in this instance the waterworks department—made, in his own time, a brush for the cleaning of the Steenbras water pipe line, and by this means not only valuable time but a considerable amount of money was saved to the City Council. This matter was brought to the notice of the responsible committee —the Electricity and Waterwork Committee—the members of which were very appreciative of what the man had done and awarded him a bonus of £25 and, a few months later, he got promotion; whilst the superintendent received a letter, on the instructions of the Council, congratulating him on the personal interest he had taken in this matter. This letter reached him a few days before his retirement, which was very nice indeed. I feel that if men were given that little extra pat on the back occasionally when they do something specially good, especially in these difficult times, things generally would go along much more merrily. (Hear, hear.)

I have just been reminded that recommendations have been made to the Council for the establishment of a scheme for suggestions and improvement, including awards. I have personally interested myself in this matter. I took this case up and I must say I was thrilled to see how many servants of the Council had the interests of the department at heart, not only during their working period but outside of it. I brought the matter to the attention of the Council and it received the hearty appreciation of my colleagues. I have also noticed that quite recently a certain Railway servant was given the sum of £5,000 for an improvement in signalling devices.

**Councillor Eden:** Mr. President,—Regarding the latter point mentioned by the previous speaker, the point that worries us at Kimberley about giving bonuses to the earning departments is the effect it has on people in the spending departments. The municipal officials have a strong association and this point, as I say, worries the Council considerably. How do you overcome it? We are in the fortunate position at Kimberley of having a staff of able and efficient men but when it comes to dealing with the question of special awards we are always faced with this difficulty — that there are the officials of the spending departments who point out, quite correctly, that these other men have the opportunity of earning awards which they have not.

Then there is another point in dealing with farming consumers, which we are contemplating at Kimberley. Suppose a line is set up and a man does not pay: how do you deal with that problem? We contemplate extensions to embrace farmers who are at present operating suction gas engines, and so on.

I cannot conclude without adding my own mede of praise to that of the previous speakers. How you find the time to do it beats me. All I would say is — Thank God we have men like you in the municipal service. (Hear hear.)

TEA INTERVAL.

Discussion of paper resumed.

**Mr. Wright**: Mr. President,—In one passage of your paper you point out that in the peri-urban areas you intend standardising auto-earthing to overcome difficulties attendant upon developing high earth resistance in the dry season. I should like to know if any of these have already been installed and what the operating results are, and if there is any objection or reason why these could not be standardised, not only in these peri-urban and rural areas but throughout the whole system. Is it a question of cost, or of unreliability, or what? Because, if there is no real objection, it appears that this type of protection is just what we have been looking for, and it would save all other earthing arrangements. It would reduce not only the cost to the consumer, but much of the inspection now necessary to see that everything is efficiently earthed. It has been suggested to me that if this system were introduced it might be necessary to have an earth leakage relay on each apparatus. Is that your practice? If not, have you found any hardships to consumers where the earth leakage comes into operation cutting off the supply through a fault which may not be dangerous, but which comes into operation easily?

I think those are all the questions I want to ask, but I should like to add my comments in respect of the size of the staff which you have been able to persuade your Council to give you. Apparently you have something which no other Electrical Engineer has, and that is the ability to persuade your Council that certain things are absolutely necessary in the interests of the undertaking. I do not think there is anyone else present who has a staff comparable in size with the undertaking that you have. But that is no criticism, sir—if anything, it is a reflection on ourselves I am afraid, in not being able to exercise the persuasive powers that you possess.

**Councillor Beckett**: Mr. President,—For anyone like myself to offer comments, much less criticism, of your paper would, I think, be the essecnce of presumption. Nevertheless, since the questions with which your paper deals present so many different features and phases, and since the various matters have been dealt with in such a comprehensive fashion, I feel that there are just one or two things that I would like to say.

Unfortunately, these papers were sent to us only two or three days before we left to come here and, in looking over the matters contained in this excellent paper, I would say that they are so vast and so important that they are well worth a convention on their own. It is just possible that we at Johannesburg are more fortunately placed than many other municipalities in some respects, but that does not reflect on anybody; it is just that the money happens to be available, and I am certain that you Engineers—especially the Electrical Engineers from the bigger centres—have so much to offer which is bound to be of benefit to the smaller municipalities that I think a paper of this kind should be dealt with on its own and not sandwiched in between a dozen other things. The question of electricity is such a vital one to the future of the whole of Africa —not merely the Union and Southern Rhodesia—that it is well worth whatever effort and labour is put into it by those who are technically equipped to provide the necessary facilities, and to furnish solutions for so many problems and difficulties which affect the smaller municipalities, the solution to which in some cases they are unfortunately financially incapable of affording.

All I would suggest, Mr. President, is that in future, if possible papers so comprehensive as this one should be sent to delegates weeks before the convention takes place, so that features of the paper can be discussed by us with our own technical officials and so that we could give a lead on topics which perhaps we would like to develop, and which would all make for the more successful and profitable running of the Convention.

Before sitting down I want to offer you our very sincere congratulations for this comprehensive and valuable report. We realise that a paper of this sort is not got out in two or three minutes. It represents a terrific amount of research and labour. I wonder if this aspect is sufficiently appreciated by all of us. We sincerely hope that these efforts of yours, Mr. President, will be productive of a large amount of good.

**Mr. Trelease** (Johannesburg): As a visitor I am very pleased to join in the congratulations offered to you on this very excellent paper, the outstanding feature of which is the progressive approach which is shewn throughout the whole of the large field covered by the paper.

I note a point where reference is made to the limiting amount a consumer can afford. I am not quite sure what is meant by that; possibly the author has in mind the "saturation limit" of the load which a consumer can take. If one is to plan on these lines, I feel there is a need for caution. Obviously it is very necessary to be optimistic, indeed with a progressive policy one must of course be a real optimist, but this does not necessarily mean that the initial plans are based on the ultimate load demand, as there are cases where the capital interest on the installed equipment and the lower distribution efficiency which would be inherent in a lightly-loaded network might be an unnecessary burden during the building-up process, i.e., during the years before saturation is approached. In

other words, it might be more economic to feel one's way by pioneering circuits and networks rather than to instal too lavishly in the first place.

I would also refer to the author's comments concerning maintenance and it appears to me that the provisions are on the generous side. It is essential to have an efficient system of maintenance records and I suggest that this can serve two functions, the first is to ensure periodic and routine attention and the other (not always appreciated) is to enable one to define—and probably to lengthen—the periods between inspections; one may find that the inspections in some cases are too frequent and in many cases an analysis of the amount of maintenance work actually carried out can result in the periods between inspections being lengthened, thereby reducing the overall maintenance costs.

The policy of making awards for useful suggestions brought forward by members of the staff is one which must be commended, and I might say that this policy is followed by my own company with mutual satisfaction. In the sense of recognising ability and ambition, my company in recent years has taken steps to encourage the five-year apprentice by inaugurating a scheme whereby such an apprentice, if he does well at his technical studies, is selected and raised to the grade of pupil at the end of his third year so that at the end of his fifth year instead of becoming an artisan at the bench, he is taken on the staff as an improver in the power station, thus opening up an avenue whereby he may become eventually an executive engineer. This scheme has excellent possibilities and is a factor towards the promotion of the team spirit that you, Mr. President, have so strongly emphasised.

In conclusion, I can only say how much I appreciate this opportunity to comment on your paper.

**Mr. Wilson:** I should like to add my congratulations to those of other speakers on this paper which you, Mr. President, have presented to us, and which should be of great value to the proceedings of this Convention.

There are only a few comments I wish to make. One is a suggestion based on Mr. Clinton's criticism of the present basis of drawing up statistics. I should like to suggest that we ask the Executive Committee to appoint a sub-committee to go into the basis of these tables, in order to amend them where necessary and give directions for the compilation of them, so that there will be a common basis in future. The other point was that raised by Mr. Powell in regard to concrete poles. There, I think, a little more information would be of value. In Pretoria we have quite an extensive rural distribution scheme which has been carried out entirely with wooden poles supplied by the Forestry Department. Some of the lines, I might mention, are 15 years old, and we have had no real trouble. I should add that the Forestry Department themselves have made use of these lines in keeping a check on various treatments of poles, and they carry out periodical inspections which have resulted in a marked improvement in the later forms of treat-

ment. I may say, therefore, that we have every confidence in these poles, and at a price of 18/- a pole it has enabled us to carry out our rural distribution fairly economically.

Another matter raised by Mr. Clinton was in regard to the use of earth leakage relays on rural schemes. We have also considered this but, owing to the war, we decided to leave the matter over in the meantime. It does appear however, to offer a solution of the difficulty in districts where good earths are almost unobtainable.

**Mr. Fraser:** As has been remarked several times this morning, members did not receive copies of the President's paper until shortly before leaving for the Convention. Previous speakers have pointed to the mass of detail and the considerable amount of time which our President has devoted to compiling these statistics, and I feel sure that if we had had more time to digest this information we should have been better prepared to discuss the paper.

I hope to be able to give a written contribution later.

(**Communicated:** Sheet 1—Trend of Peak Load—shews a decrease in the rate of growth from 1939, presumably due to the war. The curve is then projected at this reduced rate to the limit in 1964. Would it not have been more correct to anticipate a higher rate of increase from, say, 1946 if the development, upon which the whole expansion scheme is based, is to eventauate?

During the period 1934-1939, the peak load increased at the rate of 100% every 2.5 years, while the corresponding figure for Johannesburg was 3.6 years. Referring to Sheets 3 and 9, the units sold per consumer during the years 1936-1940 and the total European population in Salisbury were increasing at the rate of 100% every 6.5 and 14 years respectively. These figures are to be compared with 16.5 and 15.5 years respectively for Johannesburg. Thus, assuming that development in the post-war years will be at least equal to that considered above, and if the development of Johannesburg may be considered as a criterion, Salisbury is to be congratulated on its prospect of a very prosperous future.

It is unfortunate, in view of the increasingly important role played by protection in modern distribution and reticulation networks, that the author was unable to devote more space in his paper to this subject. Although it is difficult to criticise without knowing what the potential short circuit fault capacities and the relay settings are at each sub-station, it would appear from Sheet 13 that system stability on a through fault has not been given the recognition it deserves.

Unrestricted earth-leakage protection, as used so extensively on on the network, does not tend to give system stability unless grading is employed and that, naturally, sacrifices sensitivity. As an example the protection on the H.T. side of the transformers at the Forest Nursery and the Arcturus Road Sub-Stations is listed as being provided by inverse definite time over-current and earth leakage relays. I would suggest that, if the fault capacities at these points are of sufficient magnitude to cause saturation in the current transformers and relays, no advantage is to be gained by having the earth leakage

protection. As it is, the over-current relays would have to be set at a definite minimum time of 0.4 seconds to allow any fault on the L.T. side to be cleared. What then would be the setting of the earth leakage relay? If a D.M.T. setting of 0.1 seconds or instantaneous is used, then stability will immediately be sacrificed.

Although, theoretically, earth leakage relays are supposed to be unresponsive to faults on the L.T. side, actually, due to the D.C. component, this is not the case. The explanation, briefly, is that failure of C.T. ratio takes place due to the effect of the magnetising component which is particularly marked when transient currents are measured owing to pre-saturation of the core by the D.C. component. The most disturbing cause of unrelated residual currents occurs during switching and load transients, as a result of which, since the D.C. components in the three phases are of different magnitudes, the C.T. ratio errors are different. In consequence, a residual resultant current of decreasing magnitude circulates during this period and, if this passes through a relay, operation may result depending on the inertia and sensitivity of the relay.

The author stated that secondary spurs to farms are protected by means of drop-out fuse switches equipped for two automatic reclosures, and that delaying action fittings are now being added. It is not stated whether the delay is being introduced in the opening or in the closing cycle. If it is to be introduced in the former, it will further complicate matters as far as existing relay settings are concerned and care will have to be taken in regrading time settings.

In spite of the automatic tap changing equipment, the curves of the voltage variation at a sub-station (Sheet 14a) indicate variations of as much as 4%. Surely the steps in the tap changing transformer are more finely graded than this? If so, it would appear that the voltage regulating relays are either insufficient or unsuitable. Maximum variations of 1½% are obtained in Johannesburg.

From the standard sub-station design shewn on Sheet 16, there appears to be considerable wasted space. Although separate compartments for the transformers and switchgear is ideal, they are not, in my opinion, justified in an urban sub-station of maximum capacity of, say, 600 kVA. One room with double doors and adequate ventilation is all that is required. The H.T. and L.T. switchgear would be accommodated on opposite walls and the transformers at the end wall. Sufficient clearance must naturally be left between the lines of switchgear to permit the passage of the transformers.

It is interesting to note that the Salisbury undertaking has adopted the wide use of reinforced concrete standards, and I feel certain that engineers from other undertakings would welcome some information on the teething troubles experienced and the steps taken to overcome them.

The description of the communication system at present in use is of considerable interest to me, as a somewhat similar scheme was under consideration in Johannesburg, but it had to be deferred owing to the war. I would suggest that the difficulty encountered in con-

nection with reduction of effective range at night is due principally to an insufficiently powerful transmitter. An output of 150 watts, despite the apparent suitability of wave length adopted, is not sufficient for a distance of 40 miles when intervening wooded or bush country must be contended with.

The three year plant maintenance schedule seems to be fairly comprehensive and to cover all possible sources of trouble, but surely examination of the tripping battery should be carried out more frequently than annually, unless trickle charges are fitted. Even then, plant of such importance as that controlling the tripping of a switch on fault should receive more frequent attention.

H.T. switches which have tripped on fault should be examined as soon as possible after each trip and not after each fourth trip as indicated in the schedule.

No mention has been made of the very important practice of testing transformer oil for acidity. This should be done at least annually and the results recorded, so that a check can be kept against increase of acidity.)

**The President:** I must apologise for not having copies of drawings available before the opening of the Conference. When one reads a paper, one does so in order to stimulate criticism and enlarge one's knowledge in regard to various problems, which I have attempted to survey in this paper. It is, therefore, I agree essential that papers should be available earlier.

I do not propose to reply now if you agree to Mr. Fraser's propasal. Then I will reserve my replies to the various speakers until the final meeting of the Convention in Salisbury. Is that agreed?

Agreed.

# S.A. Standards Institution

**The President:** You will recall that yesterday when we were discussing the S.A. Standards Institute Report, Councillor G. Ferry, of Cape Town, had certain comments to make, and we asked him to frame a resolution which could be submitted to the Association. I have the resolution before me now and I will read it:

"Whereas this Association of Municipal Electricity Undertakings of the Union of South Africa and Rhodesia at the proceedings of the Nineteenth Convention assembled in Salisbury, Rhodesia, May, 1945, is greatly concerned by the legislation evident in the proposed Standards Act 1945 which we consider will have a tendency to give dictatorial powers to civil servants and semi-Government bodies such as the proposed Council, therefore the Convention urges in the interests of all concerned that the Bill be referred to a Select Committee."

I will now formally second the resolution and ask Councillor Ferry to speak to it.

**Councillor Ferry:** I think I covered all the points yesterday when I spoke in connection with various letters which had been submitted and exchanged between various bodies particularly interested in the

welfare of the industrial development of the Union, and also Rhodesia. I had in mind particularly what was contained in the "Gazette Extraordinary" on 12th January, 1945, and I should like to point out one or two things which definitely struck me in that connection. First of all, the power given to the Minister of Economic Development is, I submit, too big for one man to be responsible for. For instance, Section 5 says: "The Council shall, subject to the provisions of sub-section 2 consist of five members to be appointed by the Minister," and paragraph 6 says: "The Minister may appoint the members of the Council referred to in that paragraph, without any such lists being submitted, or appoint a member or members whose names do not appear in such list as the case may be." I think you will appreciate that consideration of a method of such importance to our country should not be left in the hands of one man, but should be submitted to a Select Committee consisting of experienced Members of Parliament, of which we have many in our Union Parliament. It was discussed in the House when this Bill came before Parliament, and when it came up it happened for the first time that members of the Government actually voted against the Government, and it created quite a sensation.

I do not propose to discuss this further now: probably other members will have certain things to bring out for the benefit of this Convention.

**Mr. Wright:** I do not know if Mr. Ferry has moved formally; is it his intention that this resolution be forwarded to the Minister from this Association?

**Councillor Ferry:** Yes—that it shall be put before a committee before finalising it.

**Mr. Wright:** Then I have pleasure in seconding it.

**The President:** In your original resolution you stated that this Convention, in the interests of all concerned, urges that the matter be referred to a Select Committee. You mean the Bill?

**Councillor Ferry:** Yes.

**The President:** Would you add the recommendation that Mr. Wright has put forward: this resolution to be forwarded to the Minister of Economic Development?

**Councillor Ferry:** Yes: and this refers only to the Union.

**Councillor Beckett:** Those of you from the Union particularly will realise only too well that our former policy is to-day developing into what may be termed "Fascist legislation." We in the Union to-day are being literally controlled out of existence. There is practically no sphere of activity which is not controlled to some extent, and in a matter so important as this one I think it is rather "passing the buck." I think it is something which every municipality and association here represented should take up with its own constituents. Let us see whether we cannot stop some of this particular type of legislation. There is no reason whatever for the suggestion which has been put forward. If only our Governments would go into the question thoroughly: if they would go to the people who know

something about what they are attempting to legislate on—not necessarily experts, but men at least of a practical mind—then they would be able to design some legislation which would be more acceptable. Mr. President, even at the risk of repeating myself, I believe that the municipalities, in the Union at all events, shou'd take this matter up. Every one of our municipalities should do so and communicate with their Members of Parliament and tell them that this Fascist legislation is of the type which we have been fighting to get rid of. The sooner we make an effort to get rid of it the better for all.

**Councillor Eden:** Mr. President,—I would draw attention to a most important clause in the Bill. That is where it provides that:

> 17. Any person to whom a permit has been issued under sub-section (4) of section 14, or sub-section (8) or (9) of section 15 shall, upon a written request from the council, transmit to the council or a body approved by the council within such period as may be specified in the request, such samples as may be so specified, of any commodity in respect to which that permit has been issued or furnish to the council within a period so specified, such information as may be so specified in regard to any such commodity or the manufacture, production, processing or treatment thereof.

I think that is terrific. I think it is going too far.

**Mr. Eastman:** It occurs to me that the difficulty we have got into through the application of the Factories Act to electricity undertakings is due to the way in which the Minister of Labour dealt with the representations we made to him. Indeed, I go further than other speakers and say that we should always do our best to prevent any legislation which affects vitally that section of the engineering industry in which we are concerned, namely, the supply of electricity, without it receiving consideration from others than the Minister and his immediate advisers and civil servants.

The Minister of Labour resolutely refused to allow the Factories Act to go to a Select Committee, whereby an opportunity would have been given to us to make representations for its amendment so as to avoid numerous inconsistencies in the application of the Act to the electricity supply industry. Interpretations of the Factories Act provisions vary throughout the country. Most of the difficulties foreseen have actually been experienced, and in our Convention to-day we have again considered the matter of continuing to press for exemption from that Act. I wou'd, therefore, strongly support the proposal that this Bill be sent to a Select Committee, for unless that is done I fear that difficulty similar to that which we have experienced under the Factories Act will arise.

**Mr. Fraser:** I must confess I am not prepared to discuss this matter. It came to me rather as a surprise that anyone was taking exception to the Bill. I should explain that as an executive member of various technical societies on the Reef, my association with the history of this Bill dates back a number of years. In the electrical world particularly we did consider that there should be standardisa-

tion and some sort of "hall mark" for all domestic appliances and apparatus in order to protect the public, and I understood that this was one of the main purposes of the Bill.

I may also add that, before it was originally presented to the House, the proposed Bill was sent to every technical society and municipality for comments. What has happened to it since I am not sure, but from the discussion this morning it appears that something has gone astray. The main object of the various engineering societies was to establish some sort of institute research department or laboratory for approving electrical appliances, both manufactured in this country and imported.

**Councillor Ferry:** I do not want to be misunderstood that I am up against standards: not at all. On the contrary, I have been a supporter all my life of suitable standards and I think the majority of members present here are fully in agreement with the idea. But why not do the same as in Britain and other countries, where they have standards for safety and health only, without pushing them down the throats of every individual or municipality—especially the smaller ones—as will, I suppose, happen in this case. I should like to mention bodies who have objected as recently as 23rd April and 17th February: I refer to the Cape Chamber of Industries and the S.A. Federated Engineering and Metallurgical Association, as well as the S.A. Federated Chamber of Industries.

**The President:** I do not think we misunderstand this resolution. I think most of us accept the Bill in regard to the provisions to which Councillor Ferry has just referred, but many of us feel that it should not become an Act before it has gone to a Select Committee. Apparently what has happened is this: certain things have crept into the Bill which antagonise various interests concerned and, unless they have an opportunity of putting forward their views they may lose the case by default, so to speak. I think that is what is behind this resolution. As Mr. Eastman has correctly pointed out, many of these things are not discussed by the persons directly concerned. Take the Factories Act: we ourselves in our organisation should have designed the legislation in the first place as a basis, and then we could ask for the approval of the State to that legislation. They would, of course, refer it to other interests concerned, and in that way you would get co-operation instead of conflict as at present where a department of the State frames the Bill on the lines they think best, without referring it to such an important body as ours, which happens in many cases.

**Mr. Wright:** I think Councillor Ferry and Mr. Fraser are quite correct in what they say. Mr. Eraser is correct when he says this was referred to the engineereing body, but apparently since that step was taken it was taken charge of by the draughtsmen of the Government and put into parliamentary phraseology. There is, however, one thing which is definitely wrong, and that is the constitution of the council. It is laid down how it is to be constituted and it would appear that certain bodies have the right to nominate, or must nominate, representatives to the council. But the "snag" is this—

the Minister is not bound to accept those nominations. For instance, the Standardisation Institution have the right to be represented on the council by two representatives. They are required to submit four or five names to the Minister, who may or may not accept any two. The right of appeal is also limited to the Minister.

**Mr. Bradley:** I am from the Port Elizabeth Municipality and, by virtue of my being here solely as a delegate sent by them, I am not sure that I would be correct in voting on a matter of this nature without their permission. Unfortunately, there is no Councillor delegate accompanying me.

Listening to the interesting discussion, I should like to know if, beyond the resolution put forward now, it would be correct for this Convention to send a copy of this resolution to the individual Councils of which this body is comprised.

**The President:** I will read the resolution again:

"Whereas this Association of Municipal Electricity Undertakings of the Union of South Africa and Rhodesia at the proceedings of the Nineteenth Convention assembled in Salisbury, Rhodesia, May, 1945, is greatly concerned by the legislation evident in the proposed Standards Act 1945 which we consider will have a tendency to give dictatorial powers to civil servants and semi-Government bodies such as the proposed Council, therefore the Convention urges in the interests of all concerned that the Bill be referred to a Select Committee."

In regard to voting, those who have votes are Engineer Members and Councillor Delegates. It has been moved that the question be now put.

The resolution was then put and carried.

**Councillor Meaker** (Somerset East): As the Bill is before the House, I propose we wire the resolution down.

**The President:** Is that agreed?

Agreed.

## REPORTS

**The President:** You will recollect that when we concluded our discussion on the reports yesterday, Mr. Eastman had proposed that the report on the Generation and Distribution Advisory Committee should be noted, and that was seconded. Are there any comments?

**Mr. Powell:** Could one comment in the form of a question? A number of Engineers are being asked if we can get certain types of plant from America, so I should like to ask Mr. Eastman what is the position in regard to the Generation and Distribution Advisory Committee and its relationship with possible exports from America in connection with heavy electrical plant?

**Mr. Eastman:** Mr. President and Gentlemen, — The Electricity Generation and Distribution Advisory Committee is an advisory body to the Director-General of Supplies in South Africa and deals only with priorities required for plant which are being issued by the authorities in England namely the Board of Trade and other committees described in the report. To the best of my knowledge, the

South African Advisory Committee has no contact with authorities for the allocation of manufacturing capacity for plant in any other country than England. The question of obtaining priority of allocation of the manufacture of plant in any other country has not arisen in any discussions of the Committee, but information on the point will be obtained before the Conference closes.

**Mr. Powell:** I might mention at this stage that I have been instructed to investigate the possibilities of obtaining heavy plant, including boilers, from America. My Council reminds me that the war in Europe is now over, so why should we be compelled to pay the prices demanded by British firms. That is why I raised the point. Probably other Councillors may raise the same question.

**Mr. Bradley:** I should like to ask Mr. Eastman through you, Mr. President, what is the position regarding priorities issued in Great Britain for heavy machinery which may now have expired, but where it is desired to be taken up by the respective municipalities?

**Mr. Eastman:** My information is that it is very unlikely that large items of plant which are required for installation in this country during 1947 will be allocated to manufacturers for production in England if licences for the manufacture of that plant had not been issued by the end of last year. With special sponsorship it may be possible to get large items of plant in 1947 still, but I would say there is a very grave risk that it will not be available during that year.

**The President:** I put it to the Conference that this report be noted.

Agreed.

# Public Utility Advisory Committee

**The President:** I will now call upon the Secretary to read the notes he has prepared in regard to the attempts we have made to obtain representation on the Public Utility Advisory Committee on the lines resolved at our last Convention.

**Mr. Horrell:** As the result of a resolution passed at the Johannesburg Conference, the following letter was addressed to the Hon. C. F. Clarkson, the Building Controller:

> At a Business Convention of the above Association, held in Johannesburg from 24th to 27th April and attended by the Chief Municipal Electrical Engineer of most towns in the Union and Rhodesia the question of the supply of materials used by municipal electricity undertakings came under discussion. The following principal points emerged:
>
> (1) In any post-war development scheme falling within the purview of the above committee, the proper and efficient supply of electrical energy will constitute a key factor to such a scheme.
>
> (2) As the increased supply of electrical energy necessitates the provision of additional generation, distribution and reticulation plant which must be planned, in many cases, two or three

years ahead of the desired commissioning dates, it is considered essential that the question of electricity supplies should be co-ordinated very carefully with the general development plan.

(3) After the war it is fully anticipated that there will be such a formidable demand for electrical equipment of all kinds that some system of priorities and quotas will be retained for some years and, in such circumstances, many difficult problems are likely to arise in making efforts to meet increased developments of electricity supplies with existing heavily loaded plant.

(4) The Association of Municipality Electricity Undertakings is the only body which exists to co-ordinate the interests and requirements of practically every municipal electricity undertaking in the country.

Against the background of these considerations the meeting felt that a useful purpose would be served if a delegate of the Association were appointed to sit on your committee and serve as a direct liaison between your committee and all municipal electricity undertakings in the country.

To this end it was resolved that:

"Representations be made to the Government that a representative of this Association be appointed on the Public Utilities Advisory Committee."

Accordingly my Executive Council will be pleased to hear whether you are prepared to accede to this request and, if so, to have information concerning the times and place at which meetings of the Advisory Committee are held.

To this letter the Association received a reply from Mr. Clarkson to say that the matter fell within the jurisdiction of his colleague, the Minister of Welfare and Demobilisation, and our letter had been referred to him.

The communication was, however, referred to Doctor E. J. Hamlin, the chairman of the committee, and he replied that his committee had considered that as Mr. E. T. Price, of the Electricity Supply Commission, had had much municipal experience and handled on behalf of the Commission most of the municipal undertakings, they did not consider it necessary for the Association to be represented, chiefly as they did not want the committee to be top-heavy.

We replied that Mr. Price was not a member of the Association and so did not represent the interest of that body which existed to co-ordinate the interests of all municipal electricity undertakings in the country.

Furthermore, it was pointed out that the Electricity Supply Commission, which Mr. Price represented, did not represent the majority of municipal electricity undertakings in the country.

To this letter the Association was informed that the committee had re-considered the matter and felt that it was unable to recommend to the responsible Minister that he should give our Association repre-

sentation on the Municipal and Public Utilities Building Advisory Committee.

The Association again took up the matter and addressed a further letter to Dr. E. J. Hamlin, and later we received a letter from the Hon. Chas. Clarkson in his capacity of Building Controller, saying that the Public Utilities Building Committee had advised him that as there were already three members who had had experience in municipal electricity undertakings there was no need for further assistance.

The Association again communicated with Dr. Hamlin, but got no further in the matter.

I may say that to this letter the Association received a reply from Minister Clarkson saying that the matter fell within the jurisdiction of his colleague, the Minister of Economic Development. Mr. Eastman may perhaps be able to speak on this, because he was instrumental in writing letters which brought this matter to a head.

**Mr. Eastman:** Mr. President and Gentlemen—My reason for taking up the cudgels in this matter was that I regard the supply of electricity as a matter of national interest. The Public Utility Advisory Committee is a committee to which every application for any kind of extension which is expected to cost more than £1,000 must be submitted for approval, and I felt strongly that this Association should be represented on that body.

Those of us who have studied legislation on the subject know perfectly well that there is no indication given in any war measure, or any other type of legislation, which recognises the importance of electricity supply by municipalities. Three of the members of the committee are well known to us personally or by reputation as being very higly skilled electrical engineers with considerable experience in electricity supply. Two of these gentlemen have been members of our Association and one of them is a Past President. I felt, therefore, that there could be no objection to either of those two gentlemen representing our Association on that committee as well as being members of the committee in their individual capacities. But the last letter we received from Dr. Hamlin, or the Minister, again completely misses the point in that it states that to appoint either of those gentlemen would add unduly to the number of the committee. That is not so while we have those two gentlemen, or either of them, as members of that body. But they may not at all times be members of that committee, and when we discussed this matter at the last Convention, I feared, and I think you agreed with my views, that the Government might at any time replace those gentlemen on that committee by persons who had no knoweldge whatever of electricity supply and, possibly, no sympathy with our objects. For that reason I wanted to see it firmly recognised that we have a representative on that committee, and the method which I suggested then and which was approved by you, did not add to the number.

We all know that in time to come it is the intention of the Government to replace the existing Controllers, who are now in civilian employ, by civil servants, and we feared that as time goes on all

three gentlemen I have mentioned would be replaced by civil servants who would not give sympathetic consideration to our wishes if they were contrary to the policy of the Government departments to which they are responsible. We preferred to make sure that on a committee of that kind our views would receive proper consideration and we have pressed for it.

You have now heard the result from our Secretary, but I personally do not take "No" for an answeer when I know that I am in the right. (Applause.)

**The President:** We are greatly indebted to Mr. Eastman for what he has done and for his remarks. It appears that this Association does not, as yet, rank very highly in the market places of the world.

**Mr. Fraser:** When this matter was brought finally before the Committee of Action, or Executive Committee, on the Reef, we were in a quandry to know what further steps we could take. We had explored all possible avenues to get direct representation on this committee, and the matter was only dropped with the feeling that, should any opportunity present itself, further efforts would be made to achieve our object.

After listening to Mr. Eastman this morning, however, I would suggest for your consideration that we again refer the matter to the proper authority, urging that a representative of this Association be appointed to that committee. With all due respect to the gentlemen whom Mr. Eastman so highly praised this morning, I would point out that, although they have a considerable knowledge of it, neither of them is actively engaged in municipal work at present, and I strongly support Mr. Eastman's idea that we should have a municipal electrical engineer on that committee to represent this Association. (Hear, hear.)

**Mr. Bradley:** I second that.

**The President:** I wonder if Mr. Fraser would submit a resolution to the Executive Council for consideration before putting it to the meeting. No doubt there are a number of arguments we could incorporate in that.

Agreed.

The Convention adjourned at 12.45 until 9 a.m. on Thursday, 17th May, 1945.

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## THURSDAY, 17th MAY, 1945

The Convention resumed at 9 a.m.

**The President:** The next item on our programme is the paper to be delivered by Mr. Southwick.

# Aspects of Relationship of the Municipal Engineer and the Post Office Engineer and its Effect on Progress

**By Mr. A. Southwick, A.M.I.E.E.,**

**Chief Engineer, Department of Posts and Telegraphs, Salisbury.**

Mr. Chairman and Gentlemen,

Firstly I would like to take this opportunity of thanking your Association for the kind invitation extended to me as representing the Post Office Engineers in Southern Rhodesia to attend your Conference. Your invitation clearly indicates a broad-minded and increasing appreciation of liaison essential in Electricity Supply and Communications Engineering, and I feel honoured to be associated with this Conference.

Throughout my Engineering career of over 30 years at the two principal centres in this Colony, I have no recollection of having been at cross purposes with Municipal Electrical Engineers. That, I submit, indicates a spirit of collaboration and understanding which I am satisfied in my own mind has been beneficial not only to the Administrations concerned, but to the public in general—consumers and non-consumers of current, telephone subscribers and non-subscribers—for where there is friction there is inevitably inefficiency and unnecessary expense.

I do not propose to read you a technical paper as the title indicates. You have your own technical problems and I am sure you do not want to hear ours. So far as the Post Office Engineer is concerned, if any body of Engineers were deserving of the motto "Ubique" it is he—for he is truly everywhere, in your roads, back yards, streets, ceilings, cellars, sewers and even in the heavens, and with the development of the Electrical Supply Undertakings we find our shadow—the Municipal Electrical Engineer—with us, but, like we, he comes not to haunt but to aid.

That brings me to the point of relationship. We in Rhodesia, South Africa and other adjacent younger Colonies and Protectorates cannot afford to ignore the necessity for collaboration and consultation with public utility undertakings. It is not infra-dig to consult with colleagues in allied professions or to confide in responsible officials of Government or Municipal administrations.

Town Planning schemes have on occasions been kept secret until actual survey has been in progress and sales about to take place. I, for my part, am satisfied that responsible Government officials can keep secrets if the circumstances are explained. In this continent far removed as we are from the source of manufacture of Electrical and Communications apparatus and materials, the necessity for the closest co-operation and confidence is very real. It is a comparatively simple matter to cut up an area for industrial or residential purposes and dispose of it, but it is not so simple for the Post Office Engineer to serve it with communications at short notice. It is, I suppose, a

more difficult problem than the Electrical Engineers for we cannot, figuratively speaking, run a pair of wires and tap every subscriber en route. Any expansion or new area invariably requires the planning, ordering, laying and distribution of underground cables, containing a pair of wires for each subscriber, apart from additional individual internal Exchange plant.

Here I should mention that my Department endeavours to eliminate serial lines as far as possible and with return to normal supply conditions we hope to afford our colleagues, the Electrical Engineers, more latitude in the air, particularly in built up areas, for we have found that in such areas, where a large number of lines are necessary, underground distribution is not only more economical but provides more reliable service. I hope in the near future no telephone wires will be visible, at least in the city area, an ideal which I know is aimed at with equal enthusiasm by the Electrical Engineer. We would avoid the joke common in older countries of the water engineer, the gas engineer, the sanitary engineer, the electrical engineer and the telephone engineer all taking turns at digging up and making good the same road or street, due to lack of consultation and co-operation.

Here again the question of location and accessibility of plant arises. Respect and consideration for the requirements of other public utility concerns is a matter of primary importance, one which should be inculcated in the minds of all junior engineers. Such training would minimise if not eliminate causes of friction and unnecessary expense.

In the older centres in Rhodesia we have sanitary or service lanes between blocks of business and residential buildings and although opinion is divided as to the desirabiltiy of such lanes, from the point of view of telephone services they afford a convenient means of distribution and access out of the way of pedestrian and vehicular traffic in busy thoroughfares. The allocation of side and centre areas in such lanes for various services has provided a most satisfactory solution to the distribution problems of the Post Office and other public utility concerns. In this connection I am pleased to say a clear understanding exists between the Post Office and Electrical Engineers throughout the Colony in respect of each other's requirements and needs, and much unnecessary labour and expense has been avoided as a consequence.

In the rural and urban areas the same principles apply but I cannot pretend that we have no difficulties, but we have no friction. The ever present problem of inductive interference looms up periodically and while most of us look forward to the day when it will be possible to fix minimum distances between communication and power supply routes, that time, I fear, is dependent upon the results of further careful research and investigation. Meanwhile, the maintenance of good relations alone can tide us over until standards are set and accepted even at occasional financial sacrifice on either or both sides, in the interests of the communtiy as a whole.

There is a further sphere in which the relationship between the Municipal Electrical Engineer and the Post Office Engineer has a bearing on public utility services and that is in the Radio field. Defects

in power and lighting lines and plant can create much interference to Broadcasting reception and these are promptly located by the Post Office Engineer and remedied with equal promptitude by the Municipal Electrical Engineer. The Radio, however, has in the eyes of the Electrical Engineer its compensations, for it can be of great assistance to him in the location and clearance of defects on long distribution lines and no doubt an opportunity will be afforded you of witnessing a demonstration along this City's electrical distribution system with wireless apparatus suppiled by the Post Office for this purpose.

Mr. Chairman, I have endeavoured to indicate in as few words as possible the close relationship between the Municipal Electrical Engineer and the Post Office Engineer, and I cannot conclude without emphasising my opinion that not only have the interests of both sides been promoted by the spirit of understanding which has always existed, but the public generally have profited thereby, and that is progress.

**The President:** Gentlemen,—I think you will agree that we are indebted to Mr. Southwick for coming along and giving us this address. I should like to take this opportunity of referring to the very happy relationship which has always existed between the local Department of Posts and Telegraphs and the Electricity Department of the Salisbury City Council. These relations have been extremely happy, not only during Mr. Southwick's term of office as Chief Engineer, but during the period of his predecessor also—Mr. Harpham, who is now Postmaster-General.

We have had the benefit of their help and advice in the solution of many of our problems. One of these which I call to mind fairly recently was in connection with the question of sanitary lanes in this city, and their assistance was considerable. I should mention that in Salisbury we have continued to provide what we call "service lanes" and we found on a careful analysis of costs that service lanes, versus a lay-out without them, shewed a saving in favour of the service lanes of about £16,000 for a block of something like 300 stands. I may add that this has been accurately worked out in conjunction with the Post Office, the City Electrical Engineer's Department, and the City Engineer's Department of the Council which is responsible for health and cleansing. So, as I say, we have been able to work together most amicably, and these relationships have resulted in a considerable saving to the community. In addition to that, Mr. Southwick has mentioned the help they have given us in providing means of communication to enable us to improve the maintenance of our system and the elimination of faults. They have done this, I know, often at considerable sacrifice because it has been done during the war period. I must acknowledge that we have not yet reached finality in regard to the system.

The question of divergent interests has never arisen because we have always settled things most amicably. We have also had the co-operation of Cable and Wireless, Ltd., which, as you know, are associated in regard to administration with the Post Office, and we have been able to settle schemes for locating not only our lines but their own receiving and transmitting stations.

So I personally am indebted to you, Mr. Southwick, and I think that our members will endorse that in their contributions to the discussion of your excellent address. (Hear, hear.)

**Mr. Phillips:** I must confess that I was not feeling very much like intelligent discussion this morning owing to the somewhat lavish entertainment provided for us last evening, but I feel I must endorse your remarks, Mr. President, particularly in view of the fact that Mr. Southwick, when he was Divisional Engineer in Bulawayo, worked very closely with our department, and there was always a very happy relationship between us. We have our problems which, of course, arise in every municipality, such as power lines running parallel to telephone lines; lines crossing; digging up each other's cable trenches and producing faults in each other's systems, and so on but we managed to get over all those things in an amicable manner.

The main point I have noted here in the paper is the question of underground services being more economical than overhead lines in built-up areas. I wish we could say the same thing. We would like to get away from overhead L.T. lines, although we have, as was mentioned, developed a very useful method of reticulation in sanitary lanes. But it will help us very much if the Post Office put their cables underground, because there is always potential trouble when an overhead service crosses an overhead Post Office line. In Bulawayo I notice that the Post Office cables are being placed underground even in the suburbs.

With these few remarks, Mr. President, I endorse all you have said about Mr. Southwick's paper, and I trust that the close relationship now existing, in Rhodesia at any rate, between the Post Office and the local electricity undertakings will continue, because only in that way can real progress be made. (Hear, hear.)

**Mr. Dalton:** Mr. President and Gentlemen, — I noticed in Mr. Southwick's remarks he made mention of the fact that the question of interference had not been tackled, or at least solved, in Southern Rhodesia. As you doubtless know, we have had considerable trouble in the Union. We have had our own problems to face in that direction and action has been taken in an endeavour to solve them.

Our engineers in the Union bring these problems up from time to time and I would venture to make this suggestion as far as Southern Rhodesia is concerned. We found that by getting together and collaborating we were able to tackle these things more satisfactorily. Then the Power and Communications Co-ordinating Committee was brought into being and that committee deliberated on all questions of interference. Before any municipality or supply undertaking can build a transmission line, the particulars and data relating to that project are submitted to this committee, and they cannot go ahead with the lay-out until they receive the right of way. Possibly in Southern Rhodesia it has not yet been considered necessary to bring into existence such a co-ordinating body. This committee is representative of the Electricity Supply Commission, the Railways, the Post Office and other interested parties, and there

is no doubt it has proved very satisfactory. They get down to business and they go thoroughly into this vital question of separation.

To give you some idea of what it means: we have had to remove 88 kV transmission lines from Harrismith to Bethlehem. It is possible that most of the transmission lines will have to be removed away from Post Office lines, but so far all this has been done quite amicably and I would suggest that something of the kind be considered in Southern Rhodesia.

**Mr. Harpham** (Postmaster-General, Salisbury): Mr. President and Gentlemen,—The last speaker—Mr. Dalton—has mentioned a statutory committee, which has been of much assistance and value in the Union; but so far as this Colony of Southern Rhodesia is concerned, I do not think that at present it is really necessary to establish such a committee, chiefly on account of the valuable co-operation and goodwill which exists between the various municipalities and the Electricity Supply Commission.

I think Mr. Southwick was quite correct in saying that this problem of interference had not been solved. I do not think it has actually been solved in the Union, in spite of the committee they have there, although no doubt that committee goes a long way towards eliminating a lot of trouble and co-operating betweeen the various electrical undertakings. However, I will give you a little warning at this point. We have recently imported an instrument known as a "psophometer" and that will dispense to a great extent with the human factor as regards testing noise levels.

I am pleased to see that Mr. Southwick's paper has been received with so much favour by you gentlemen who represent municipal undertakings.

The imagination of lawyers pales into insignificance when engineers draw swords. There is no doubt that an immense amount of time is saved and expense is averted by this co-operation. (Hear, hear.)

**Mr. Eastman:** Mr. President and Gentlemen,—I, too, have read Mr. Southwick's paper with great interest and the one outstanding feature which occurs to me and which is referred to in the paper is the co-operation which exists in Southern Rhodesia between the supply authorities and the Post Office Department in smoothing out their peculiar difficulties. I am pleased to say that that also applies in the most southerly part of Southern Africa. We down there have the very happiest of relations, not merely officially but also personally, in regard to problems of this kind. It is all the more satisfactory that this should be so because of the nature of the powers conferred by legislation on the Post Office Department. It is worthy of record, therefore, that the wideness of these powers has never as yet brought about a complete impasse in the carrying out of our work.

Another point I should like to refer to in Mr. Southwick's paper is in reference to the use which radio now makes of the electricity supply. The "small current" engineer and the radio engineer are comparatively new entrants into the field of electricity supply, and I cannot help confessing that it has troubled me for a long time that, except in the case of university graduates very few of the

oncoming engineers in these spheres have received any really good technical or practical training in small current work. This, I suggest, is a matter which should receive very serious consideration by our Association.

**Mr. Fraser:** Mr. President and Gentlemen,—I should like to offer my quota of thanks for this very interesting paper. Mr. Southwick's paper has shewn to engineers gathered here this morning what wonderful co-operation exists between the staffs of electricity supply undertakings and the Post Office Department. You, Mr. President, made reference just now to the Chief Engineer of the Union Post Office, and I should like to say that, as far as the Johannesburg Electricity Department is concerned, we enjoy the closest co-operation with the Post Office Department.

(**Communicated:** The necessity for liaison, not only between the electricity supply and the communications engineer, but also with all the other engineers concerned with public services, has long been recognised in Johannesburg and, with a view to promoting closer collaboration between the various branches of engineering, a committee was formed consisting of representatives from the Posts and Telegraphs, Water, Gas, Sewer, Roads and Electricity Departments. At regular meetings of this committee, each department presents a schedule of such of its forthcoming works as are likely to affect any of the other departments, so that as far as possible, all work may be co-ordinated in order to raise efficiency to a maximum and obviate unnecessary expense and inconvenience to the public. Further, the Electricity and Posts & Telegraphs Departments have come to a working agreement, whereby the former carries its services on the north side of all streets running east and west, and on the west side of streets running north and south, while the latter takes the south and east sides.

Although it goes a long way, this committee does not constitute the full and final answer to collaboration. Occasions arise when, for instance, the town planner or the architect should come into the picture. In Johannesburg, as in other cities, the electricity supply distribution and reticulation networks are effected by means of underground cables in certain of the suburbs and in the central area. In the latter there is also a system of tunnels for the accommodation of main distributors, feeders and interconnectors. In this area, telephone cables are also run in tunnels, while sewers and water and gas supply mains must, of necessity, be run underground. Thus an ideal, from most aspects, would be to have tunnels, running the length of each street, of such size and design as to provide accommodation for all public service mains. These tunnels should be constructed when the town is first laid out; but even at a very much later stage in the development of the town their construction could with the close collaboration of all concerned, be undertaken as a long term policy. Their provision would largely obviate road excavations in central areas, where such work can least be tolerated, and would reduce to a minimum the work involved in the installation of new services and the maintenance of those existing.

At present in the Union of South Africa, the erection of overhead lines is governed by three separate and distinct sets of regulations, which are at variance with each other on a number of points. This is probably due to lack of collaboration between the parties responsible for the drawing up of these various seets of regulations. However, a move, in which the A.M.E.U. is taking an active part, is being made to draw up a set of regulations which will be standard for all parts of the country and will satisfactorily cover the requirements of each of the sets referred to above.

In most towns, and particularly those which have developed rapidly, it will be found that electricity supply undertakings own very little land, especially in the central areas. Hence, sooner or later, the supply engineer is faced with the problem of acquiring sites suitable for the erection of load centres to meet increasing demands for electric power. When old buildings are demolished and negotiations are made for the purchase of a portion of the land, the undertaking is often compelled to take an area far larger than is actually required. I have no doubt that communications engineers are sometimes faced with a similar problem and it occurs to me that the two departments could often co-operate in the purchase of land and thus save themselves considerable hardship. It would, no doubt, be necessary for the supply engineer to take certain precautions with his plant to avoid interference in the adjacently housed communication equipment, but I think that, with the collaboration of the communications engineer, this could easily be arranged.)

**Mr. Gripper:** I should like to add my quota also Mr. President, to the chorus of praise offered to Mr. Southwick for his excellent paper, the effect of which I feel, as far as I am concerned, is not so much that of inviting questions but of raising matters in regard to which we can put forward our views and possibly "scrap" amongst ourselves.

In connection with Mr. Dalton's reference to what I alluded to yesterday as an "Interference Committee," I wonder whether he could tell us if that committee has reduced the figure which, I believe, was formerly 33 kV in which interference was known to exist up to a distance of 600 feet. I understood at the time that that figure came from America, and it meant that if we were putting up an 11 Kv line, we had to keep at least 600 feet away from communication lines, not so much because it was known that interference would be caused, but because it was below the lowest voltage for which data had been collected. Above that point, I believe, greater separation is required.

Another point I would mention is that of "regulations." With your permission, sir, may I read a short regulation which we in Worcester have taken about three years to get into a form which is acceptable to the Administrator, the legal advisers, the Electricity Supply Commission, and the Postmaster-General. This regulation is possibly new, and I should appreciate any criticism at this stage which might be of help to us all.

"Radio Interference and Other Disturbances. — (a) No consumer shall cause or permit to be caused any disturbance to radio reception in his neighbourhood and on receeipt of notice by a consumer from the supply authority or from the Postmaster-General to the effect that such disturbance has been traced and/or appears to emanate from his premises the consumer shall immediately take steps to locate and remedy any cause for complaint of this nature or it shall be incumbent upon him to prove to the satisfaction of the engineer that such disturbance does not emanate from any installation or apparatus under his control."

Now, as a protection to the consumer this paragraph has been added:

"It shall be considered sufficient proof that the apparatus is not the cause of the complaint in question if the interference persists when the said apparatus is shut down entirely and disconnected from any electricity supply."

(b) No consumer without the approval of the Council shall be permitted to use or operate any electrical apparatus connected with the mains if such apparatus is considered by the engineer to cause interference with radio reception or to cause any disturbances in the supply to neighbouring installations."

This regulation endeavours to combine the efforts of the local authority and the Postmaster-General in eliminating interference in a manner which is fair and equitable to all concerned.

**Mr. Dalton:** I suppose it is desired that I shall reply to the remarks of the last speaker. All I can say is that the Power and Communications co-ordinating Committee is actively engaged at the moment on this question of separation. The meetings are at present rather infrequent due to war conditions, but as soon as things settle they will get down to some fundamental basis of work. At present they accept the American figures, but we are endeavouring to carry out certain research work to determine our own separation for local conditions in this country.

**The President:** Mr. Southwick will now reply to the discussion.

**Mr. Southwick:** Mr. President and Gentlemen,—One or two very interesting points have been raised by various speakers. It is hardly necessary for me to say that all these points have been considered by this Administration and in fact are still being considered. One of the chief problems mentioned is the question of power interference. As Mr. Dalton has indicated, we are at present awaiting the findings of the commission that is going into this question in the Union. It is doing so, we understand, on the lines of those figures put forward in America. How far it may be found practicable to apply their recommendations to local conditions is another matter: as far as I can see, that is going to be one of the big stumbling blocks. When it comes to erecting lines 600 feet apart it will be quite a problem. We quite appreciate the difficulty engineers will have in this connection. As regards ourselves, of course, we have not so much difficulty as you people have in getting wayleaves and in constructing lines here, there and everywhere in order to keep 600 feet away.

Anyhow, the point is this: the matter is still under consideration and we are keeeping a keen eye on it. We have a large administration in the Union and an important body which is dealing with it. It is true we have no such committee here in Rhodesia, and up to now we have done everything necessary by co-operation and collaboration.

Mr. Gripper raised the point about interference. We here in Rhodesia, like many other Governments, are a bit nervous about introducing legislation against individuals using power and various kinds of apparatus which creates interference, particularly at present when materials, apparatus and machinery are so difficult to obtain. I think I am voicing the opinion of most people to-day when I say that we are looking to manufacturers overseas to find a solution of this problem—the creation of interference and annoyance as between one consumer or user and another. In that respect, of course, it is not impossible to provide the means of preventing interference, but I think if we do as they are doing in the old country, it will be better—that is to say looking to the manufacturers to provide their own means and to bear in mind all the difficulties to be met with when they are exporting their goods, then I think we shall make some progress. In regard to legislation, I think we all hate it and if we can attain our object without it we should try to do so. That is my own personal view.

(**Communicated:** Mr. President,—I thank Mr. J. C. Fraser for his comments on my paper; they certainly raise other debatable points. He has mentioned the provision of tunnels for the accommodation of all services served by underground plant, and the allocation of specified areas under public thoroughfares for the plant of each controlling body.

In so far as Rhodesia is concerned, the latter arrangement is already very successfully operating. In regard to the former, the present state of the country's development has not yet justified such measures, and consequent on the tendency of town planning authorities towards the limitation of large concentrations of population and wider thoroughfares, together with the technical development in the carrying capacity of telephone cables, the expense of the provision of air conditioned tunnels is unlikely to be justified.

With regard to the acquisition of land and siting of power and communication centres in adjacent areas, while collaboration might be beneficial in certain circumstances, the economic centre of each undertaking is unlikely to coincide, and this together with aesthetic considerations, would I fear preclude any general application of the principle.)

# Demobilisation Committee

**The President:** This morning your Executive decided that the report on demobilisation which has been prepared by Mr. Fraser should be put before this Convention. I now call upon Mr. Fraser to read his notes.

**Mr. Fraser:** Being vice-chairman of the Honorary Advisory Committee for the Electrical and Allied Industries (Demobilisation) in Johannesburg gives me the authority for addressing you on demobilisation matters and on behalf of that committee I wish to thank you for this opportunity.

As the war in Europe is now concluded, the Union of South Africa is being faced with the welcome task of demobilising at least part of its forces and re-absorbing them in civil life.

I want to tell you something about the demobilisation plan that has been put into effect to facilitate this re-absorption and in particular about the position of the man who has been trained as an artisan in the Union Defence Force.

The most important factor in the demobilisation plan is the provision of employment for ex-volunteers, for it has been laid down as a policy, that no volunteer will be discharged from the Union Defence Forces until he has been offered suitable employment or other provision has been made for him. In order to implement this policy as well as to administer the various benefits accruing to ex-volunteers, the Union Government has, as you have probably heard, set up a Directorate of Demobilisation with Major-General George Brink C.B., C.B.E., D.S.O. (who commanded the first South African Division), as Director-General, and staffed almost entirely by men who have seen active service in the present war. This directorate has set about the task of reinstating ex-volunteers with tremendous enthusiasm.

The first steps required in order to plan the orderly demobilisation of the men and women in the forces was to get as much information as possible about their education, occupational background, their skill, their present qualifications and their own plans for returning to civil life — all this information has been obtained by means of an occupational questionnaire which was completed by every man and woman serving in the Union Defence Force. This questionnaire is now being analysed.

The next step was to obtain all possible information about the job into which these men and women could be fitted. In order to do this as comprehensively as possible, the Directorate of Demobilisation realised from the outset that the complete co-operation of both trade unions and employers' organisations would be necessary. This was attained by the formation in every trade, industry and profession of Honorary Advisory Committees, which are composed where possible of representatives of employers and of trade unions. The functions of these committees is to give the directorate an indication of what opportunities exist for the employment of ex-volunteers in their particular fields, to make recommendations as to the training of ex-volunteers and to make suggestions which might lead to increased employment.

They also assist the directorate in actually finding employment for ex-volunteers. For example, a man who had been a motor mechanic in a small garage joins the army and on discharge he finds that his firm has closed down. Details of his case are sent

to the Honorary Advisory Committee for the motor trade with a request that they try and place him — and they do, too.

These committees are also being used to distribute a questionnaire which the directorate has put out to all employers of labour throughout the country. This questionnaire asks employers how many ex-volunteers they will be able to absorb immediately and in twelve months after the war and under what conditions they could employ even more ex-volunteers. The object of the questionnaire is to give the directorate a complete picture of post-war employment problems. The one-half of the picture is, as I have told you, the questionnaire to the troops, asking if they have employment to return to or if not, what they want to do . . . the other half is filled in by the answers given by employers saying that jobs are or will be available. By means of this picture it is hoped that those men and women who have no employment to return to will be found employment, and those who wish to go to overcrowded occupations will be diverted to occupations where more opportunities exist. Vocational guidance officers who will be stationed at every dispersal depot through which volunteers are discharged will also be able to make full use of the information in this respect. For example, in the Union, the engineering industry is overcrowded, while the building trades have room for many thousands. Vocational guidance officers will therefore have to try and divert would-be engineers to builders and so on.

It must be borne in mind that the directorate's principal concern is with those young men and women who joined up straight from school or university and who have no jobs to go back to. Some of them while in the army have learnt a trade; they are fitters, electricians carpenters, and when they come back to civvy street, they won't want to waste the knowledge that they have gained in the course of their service.

With regard to those in the forces who had some job before the war, the directorate's policy is not to assist ex-volunteers who seek to change their employment. Men who left their jobs to join up are, of course, protected because under a War Measures Act their employers must take them back. It is only in cases where they are unable to return to their pre-enlistment occupation, owing to disablement, or because the particular trade has become so overcrowded that they cannot make a living, or because they have acquired additional knowledge or qualifications in the Union Defence Force that would enable them to make a success of a new career, that the directorate would assist them to change their pre-enlistment occupations.

It is this last exception—the man who has learnt a trade in the army and the case of the youth from school who never had a job but who became a trainee under the army training schemes—that I would like to enlarge upon. As you can all understand, when war broke out and general mobilisation took place in the Union, it became obvious that a considerable number of artisans would be required to service and maintain the great diversity of vehicles and

aircraft and all the other mechanical or electrical devices which are essential to modern warfare.

At the outset, enlistees who in civil life had received training as mechanics, engineers, electricians or builders were transferred wherever possible to the appropriate technical branches of the Army and Air Force. This measure provided a nucleus of trained artisans, but the requirements of the forces far exceeded the numbers available. To meet this shortage the Army had to initiate schemes for training suitable volunteers in the various trades — in general engineering, in mechanical and electrical engineering, in carpentry, building, leather work and even in catering and in cooking. Most of the suitable volunteers were young, straight from school, who would normally have been apprenticed anyway, but there were others who had been clerks, shop assistants, etc., and as I have said the greater majority of these men when they come back will want to follow the trade that they have learnt in the Army. In fact, there are already many of these technical workers who have been, or who are being, discharged from the Army for medical or other reasons, so the Directorate of Demobilisation has had to tackle the thorny problem of getting some form of recognition of Army-trained artisans by employers and employers' organisations. This question is now being settled. Committees consisting of representatives of the trade unions, employers' organisations, the Union Defence Force Artisan Board, and the Directorate of Demobilisation have visited Army training centres; have seen the trade tests that Army trainees have to pass and have had an opportunity of considering the system of training. As a result of these visits, the committee was able to put forward recommendations which, it is hoped, will lead to the recognition of the qualifications of the Union Defence Force artisans in the trades concerned. You will, I am sure, all agree that a measure of this nature is warranted, for although the rights of the civilian trained artisan must be protected, we must all be prepared to stretch a point in favour of those chaps who, through joining the Army, have lost precious years in which in the ordinary course of events, they might have been fitting themselves to take their places as craftsmen.

The Directorate of Demobilisation is confident that with the co-operation of employers' organisations and trade unions that has been shown to date, the demobilisation plan will succeed and that one of the primary problems of the whole question of post-war reconstruction will be solved.

In conclusion I would urge every electrical engineer in the Union and in Rhodesia, particularly those in the larger centres, to form regional committees to deal with the problem in so far as it concerns the electrical industry, and I appeal to you all for your full co-operation in this large and very important problem of demobilisation. (Applause.)

**The President:** We are indebted to Mr. Fraser for preparing these notes which give his views. I might add that your Executive dealt with the question this morning and decided that we should act by

sending a circular to every engineer belonging to the Association asking for full co-operation on the lines indicated by Mr. Fraser. Are there any comments?

**Mr. Fraser:** I might also add that a questionnaire will be posted shortly to each Town Electrical Engineer and the Demobilisation Committee would appreciate their co-operation in this matter.

**Councillor Eden:** Mr. President and Gentlemen,—Speaking personally, I must say I think the whole scheme has been over-organised and committees have sprung into being not by the dozen but by the hundred. The actual position is that men who are definitely skilled have difficulty in getting out, particularly in regard to municipalities and similar public bodies. I think electricity undertakings and other similar concerns will find that the difficulty about placing men is not the real trouble at all, and I should like to hear some expressions of opinion in regard to this latter point particularly.

As regards the liaison concerning demobilisation between the portfolio of Mr. Lawrence and the Adjutant-General, it seems impossible to make any progress at all. The municipalities will, no doubt, be the biggest employers in the post-war labour field, because they have the biggest opportunity and the largest programme of public work. I saw a letter a little while ago, and the position appears to be that the municipalities are asking for men to be released. They want the technical men back so that plans may be prepared and the ground work set up in order that those men now in the Army may have work to come to. (Hear, hear.) So that all these various committees are, in my humble opinion, entirely superfluous. I was present at a meeting in Cape Town not so very long ago when these points were raised and I hope this Convention will tackle the problem from this point of view.

In regard to electrical undertakings particularly, the services of technical men still in the Army are badly needed and I suggest that arrangements should be made for those men to be available for demobilisation now. In saying that, the point is that we have nothing to do with the man while he is in the Army, but afterwards we will fix it up. Therefore I repeat we should make representations in the proper quarter for these men to be brought out in advance so that the necessary groundwork can be completed. I may mention that we in Kimberley in particular are under an enormous handicap at present owing to the large percentage of our technical men away on active service, and we cannot get them out.

Another point is this: that some of the men who do come out are finding better jobs in commerce and elsewhere, and in this way they will be lost to us. So I think that men who come out in this manner should be restricted in some way. Just the same as with the employers. The municipality is compelled to take these man back: I think that when they are released there should be some compulsion on them to remain with the Council for at least a period. That is one side of the question. And then there is the matter of the trade unions. Some definite statement must be made about this. The trade unions are working on the "closed shop" principle as a whole.

These men who are getting technical training will come out and the trade unions must accept them: they must deal with these people and as far as I can see it, they are not doing it. That phase of the question should be tackled by the electricity undertakings and tackled promptly. I mean there should be some statement of policy in relation to these men who went into the Army as furniture dealers, shall we say, and came out as motor mechanics, and so on. The views of the trade unions should be obtained and a public statement made.

There is also the question of those artisans who come out and make application for tools. In the Union they are entitled to a sum up to £50, and the job of getting the stuff through to Pretoria takes not weeks but months. The local committees set up in the Union to deal with this problem have no power whatever. There is a set standard scale as regards tools for a particular trade and it is quite easy to ascertain whether, for instance, it is necessary in Cape Town, instead of which it all goes to Pretoria, and then from Mr. X in Sanlam Building to somebody else, and we cannot bring the thing home. So there should be some decentralisation in this respect. The position should, therefore, be clarified. There should be a statement made in regard to the £250 grant, as well as the £1,250 loan. Rightly or wrongly, some of them think that all they have to do is to make application for this £250 loan and they can set up in business on their own account immediately.

These are some of the points to which I think this Advisory Committee connected with electrical undertakings should give attention. As far as Kimberley Municipality is concerned, we are only too anxious to do all we can for these men. We want to assist them to the best of our ability, but the whole position must be clarified, the road must be made smoother, and the works must be oiled. (Hear, hear.)

TEA INTERVAL.

**The President:** I suggest that you make your contributions on demobilisation as brief as possible. Or, alternatively, you might prefer to have a particular motion before you. Perhaps that might be the better plan. So would someone move a resolution for consideration by the Convention.

**Councillor Pritchard:** I agree that we could spend hours in discussing this question without getting very far. Personally I should like to endorse Councillor Eden's remarks and to add that the Durban Municipality is suffering from the same disabilities—overlapping.

In conclusion, I should like to move that this matter be transferred from this Convention to the Executive Committee, to be dealt with by a sub-committee, or in whichever way they may deem fit.

Mr. Stevens seconded the resolution.

**Councillor Beckett:** Mr. President,—While being somewhat in agreement with the proposition which has been put forward to the Convention this morning, I feel I should like to move an amendment to this effect:

"That before the question of general demobilisation can be seriously considered we must find out the accepted policy of the Government."

I say that because the topic is so vast. The whole gist of the demobilisation plan is tied up on these lines — and this is a most important factor.

The demobilisation plan, so far as we understand it, is the provision of employment for ex-volunteers. That has been laid down as the policy. And that no Union volunteer will be discharged from the Army until he has been offered suitable employment, or other provision has been made for him. Well, of course, that is a particularly laudable ideal, but we are very much afraid that it is going to turn out to be only another pious wish. Because it is clear that at the moment, demobilisation and the question of re-employment is being left to all and sundry. Nobody appears to have any particular guided theory, and if there is one authority throughout this sub-continent from whom we should get a lead, surely it is the Government. We are not in a position to say that so many men and women will be employed unless we know exactly what the ideas of the Government are. And I feel that if we proceed as we appear to be doing, there is just the possibility that we will be closing the stable door after the horse has gone.

Mr. President, Mr. Fraser in his able paper this morning told us that these questionnaires had been sent out. They have been sent out to every member serving in the armed forces — at least to those they have been able to get at — also to every employer of labour. Well, after having just recently come out of the Army myself after about four years, I think I know more or less what the feelings of men and women in the Army are on the subject. Now, these men have been discussing this thing during their off periods, and many of them have decided that possibly the jobs they had prior to the war are not those they are happiest in: consequently, they would like to take up some other avocation and they will possibly do this when they come back. Well that constitutes one difficulty, but when we come to the questionnaire that has been sent to employers we find a totally different state of things altogether. I happen to be an employer of labour myself and therefore I know what I am talking about — and I ask, how is it possible at this moment for any employer of labour to say how many men he is likely to be able to employ twelve months hence? How can he answer that question if he does not know the policy of the Government? When you consider the number and variety of industries concerned, I claim it is a physical impossibility. If we were only considering building activity which is likely to occur in the country, we might have some ground for saying that we feel we are able to estimate what amount of work we are likely to do during the next twelve months. But even in regard to building we do not know. That industry is so tied up with control that we have not the least notion what the Government's policy is. Is it going to confine its activities to building of national houses, or what proportion of its building

programme does it intend allocating to industry, and so forth. We all want to help as far as possible, but the position must not be made more difficult than it is or need be.

It has been stressed by one of my colleagues here that there are far too many committees dealing with demobilisation and I think that is perfectly true. What is everybody's business is nobody's business, and I think the smaller the authority they can confine this matter to the better.

One point was stressed by my friend from Kimberley — of course it would be from Kimberley (Laughter) where they get their money so much more easily than at Johannesburg. I hope that no one here will feel that I am attempting to work the parish pump or indulge in propaganda, but I happen to be a Labour representative and I would like to give Labour's idea of it. He said that the trade unions would have to play their part. Well, they are perfectly willing to do so, but they are not prepared to accept men into the various industries at a rate of remuneration much lower than the rate which is at the moment being offered to mechanics.

I would like members of the Convention to try and view this thing objectively. Let me say at once that Labour has no axe to grind. Labour is merely looking for that measure of social security which has been promised. If the Government in power is in a position to promise a continued period of work at a wage which will allow of those mechanics being able to maintain their families on a decent standard of living, believe me, the trade unions will be the very first to accept the suggested solution and assist as far as possible. But because of this "sword of Damocles" which is hanging over the heads of the workers all the time, they are particularly jealous of their means of livelihood, and surely they have every reason to be.

This is a young country with a future which is almost "second to none," provided we plan and build it up on really logical lines and those lines will only be created by the amount of co-operation which we—the Labour representatives with the Government together —can exert. It is such a big question that one could go on for hours, but in attempting to confine my few remarks to the most salient features of this question of demobilisation, I do hope I have not offended the susceptibilities of anyone. But I feel that we as Labour representatives have such an enormous amount to contribute to the future of South Africa, that our help must be invoked and accepted, because it is on the workers of this country that future prosperity must largely depend. (Hear, hear.)

**Councillor Boylan** (Johannesburg): Mr. President,—I am going to support the amendment and my reason for so doing is because the Government, of the Union at all events, has for the last few years been shilly-shallying with the future of the discharged soldier. It is a question whether what we have proposed amounts to a rehabilitation scheme. We, who are representing the City of Johannesburg, have been in communication with the Government with a view to making preparations for demobilisation, but, practically speaking, we have got no further than we did in 1940. We have

made application to the authorities for many of our municipal technicians to be released and to return, and we have made provision for work to a value of eight millions, on which we could, of course, employ thousands of men discharged from the Army. But nothing has been done. We can get no agreement or even recognition from the Government as far as financial relations are concerned and we are simply getting tired of "passing the buck." For instance, we have made plans for about 30,000 houses to be erected within a period of from 5 to 10 years. We have the ground and it is a question of getting materials, but the fact is that we cannot get our technicians released. As I say, we have been negotiating for the release of many of our quantity surveyors and other technicians and until we get them back we can make little or no progress in regard to post-war developments.

This affects every section of the trade union movement. We have all heard about this dilution of labour and the offer or the promise which has been made that for every artisan discharged or demobilised the trade is willing to take on one young man who has missed his apprenticeship owing to the war, but they will not take them on because they have been trained in the Army, or I should say partily trained there. These men are not artisans — they are operatives. But the trade unions are willing to give intensive training of twelve months to these men, ensuring to them a living wage for that period on one condition, namely, that the Government will augment that. Because you cannot expect a contractor or a municipality or an engineering firm to take these partly trained men and put them into trade unions at standard rates of pay, without the necessary qualifications. But we wonder what the Government intends to do about these people. If the Government will give the assurance that they are going to subsidise maintain and help these people over a certain period, the trade unions will fall into line. But their first duty is self preservation. They have to protect themselves and it is the Government's duty to protect these men and women who have been in service for the last five years fighting for the freedom of this country.

So I should like something to go forth from this Conference demanding that the Government shall lose no time in letting us know what they are prepared to do. And more particularly to suggest that all the different municipalities make application for the immediate release of these technicians, so as to make possible the carrying out of plans and schemes for future development.

**Councillor Eden:** I have prepared a resolution which I think will cover the ground, with particular reference to municipalities. The resolution reads as follows:

> "This Convention resolves that the attention of the Minister of Defence and Demobilisation be drawn to the fact that it is impossible to plan for the re-employment of discharged volunteers without the assistance of the technical personnel required to prepare the necessary plans for post-war developments."

Then I suggest that the Executive, who have a wide knowledge of

the subject, will be able to tack on what is necessary to that skeleton. If it is acceptable, I move accordingly.

**The President:** We now have a proposal before us, to which Councillor Beckett has moved an amendment.

**Mr. Fraser:** Mr. President,—The Demobilisation Committee asked me to bring this matter forward with the sole object of seeking co-operation and assistance of electrical engineers in every large and small town. I may say that all the points raised this morning in discussion have been gone into by the various Demobilisation Committees. They are important points and are not being overlooked.

In regard to the remarks made by the Councillor from Kimberley, I am entirely in agreement with him. We all know there is difficulty in getting trained men out of the Army and I should certainly like to see this Association do something in the matter, but all such representations must be addressed to the Adjutant-General of the Union Defence Force. Demobilisation committees only come into play after a man has been discharged from the Army. We have raised this question time and again with Major-General Brink, and his reply has always been the same: "Refer your difficulty to the Adjutant-General—I have nothing to do with the Army; I only deal with the man after he has been discharged."

**Mr. Eastman:** Mr. President,—In connection with the allegation that there are too many committees of this kind, I should mention that in Cape Town the City Electrical Engineer has been asked to form a Divisional Advisory Committee for the electrical engineering industry, advisory on employment questions in that section of industry to other committees dealing with wider aspects of re-employment of service men.

The organisation is a complex one, but so is the problem.

**Mr. Fraser:** The Demobilisation Sub-Committee felt that all electrical cases should be referred to our own regional electrical engineers, because, if a case were referred to a general committee, its importance might be lost sight of.

**Councillor A. N. Symons** (Kroonstad): Mr. President,—We have heard some suggestions emanating from gentlemen from the bigger centres. But some of us come from the smaller Free State towns where, politically speaking, we are unfortunately somewhat divided and this fact must, I think, be taken into consideration. Therefore it will be evident that the job of looking after the returned soldier is much more difficult in our areas.

Ours, for instance, is only a small town with a limited amount of employment to offer and the position is that in these smaller places there are too few people to discharge these duties. It is always the willing horse that is called upon to do most of the work.

I could mention one instance when the first committee, of which I am a member, was appointed to interview Col. Klerk, the Free State representative, on this matter and we put one point to him. We said: "We have nothing against the demobilisation plans, but we feel as regards the small town that the Department in Pretoria should assist us in so far as we cannot get a man who is able and

willing to do the work for nothing. Such a man should at least receive some small remuneration for what he does. At present the work is being done by an ex-magistrate who happens to be living in Kroonstad. It is not exactly that he looks to earn money by this means, but quite naturally there are little expenses he has to meet and which should be covered, in our opinion." That is how I feel the Government should assist the committees in small towns. For instance, we have no office accommodation. They want me to hire an office, but this is more difficult in the smaller towns and we certainly could not get the municipal offices in Kroonstad, because, as I pointed out, we are not of the same mind politically.

We are quite prepared to do our job, and indeed to go to almost any lengths to assist these deserving men, but we do feel that this Government should give us some assistance, because the ultimate success in placing that man ultimately falls back on your local committee. If you do not make a success of it in the small towns then your bigger cities will suffer afterwards.

Although what I have just said may not be strictly relevant to the subject under discussion, Mr. President, it seems to me to be a point in making the scheme a success. (Hear, hear.)

**The President:** I think these various comments will be helpful to Mr. Fraser when he reports back to his committee, but in order to achieve progress could we have Councillor Beckett's previous amendment read to us again.

**Councillor Beckett:** Mr, President,—If the mover of the motion is prepared to accept my proposal as an addendum to this motion, I will withdraw my amendment.

**Councillor Pritchard:** Mr. President,—I have put forward a resolution, but I am afraid it has been lost sight of. It is as follows:

> "That this matter be transferred from this Convention to the Executive Committee to be dealt with by a sub-committee, or in whichever way they may deem fit."

I feel, Mr. President, that that resolution could be handled by the Executive of this Conference, and it would meet all the requirements that have been put forward by the various speakers. Then afterwards a sub-committee appointed by the main Executive of this Conference could deal with the various aspects with Mr. Fraser, through the various municipalities and centres concerned.

**Councillor Eden:** I should like to say, in explanation of my previous remarks, that they were certainly not of a destructive nature. But these are undoubtedly difficulties with which we are faced. The real object we have in view will, I think, be met by the proposal of the gentleman from Durban, the addendum of the representative from Johannesburg, and my own resolution. I am agreeable to accept the proposal put forward by Councillor Pritchard, of Durban.

I do not desire us to have divided views on this matter. Whatever we decide on should be unanimous. (Hear hear.) So I appeal to the various speakers that a resolution in suitable terms, representative of our united view, should go forward from this Convention.

**The President:** Might I suggest that you accept Councillor Pritchard's resolution drawing the attention of the Executive to the matters that have been raised, by way of addendums, and that at the last meeting we should submit our findings and see what the Executive propose to do in regard to the matter. Is that agreed, Gentlemen?

Agreed.

**The President:** The next item is the consideration of reports left over from the previous day. Those which have been deal with already are Nos. 1 to 10 inclusive, with the exception that No. 10 has been referred to your Executive for the purpose of devising some resolution which could further the object which was proposed at our last Convention in Johannesburg.

You will doubtless recall that we have made application for membership or representation on the Public Utilities Advisory Committee. That was refused by the chairman after protracted negotiations, but I think that most members here still feel that we should be represented as an Association on that committee. The Executive has been unable, as yet, however, to deal with this particular item. Accordingly we will go on to the Salary Scales and Pensions Committee Report. Mr. W. N. Powell will deal with this matter.

# Salary Scales and Pension Committee

**Mr. Powell:** Mr. President,—I must say that I submit this report with a certain amount of fear and trepidation. Indeed I can imagine no more contentious subject than the salaries of engineers.

You may recollect that this matter was introduced by Mr. Angus, of Port Elizabeth, at the last Convention and, in view of the fact that I had had the advantage of operating under a schedule of salaries for electrical engineers overseas for some years, it is hardly surprising that I was called upon to give some information to the Convention. Since that time Mr. Angus himself has gone overseas on another job and it was resolved at the Convention that a subcommittee should be formed to go into this question and the Convention apparently felt that I was a fitting person to step into the breach due to the absence of Mr. Angus. That is why I am in this position to-day.

It may also be remembered that at the last Convention I personally was not in agreement with this question of salaries being dealt with by this Association. I pointed out that ours was not an Association of Municipal Engineers; it was an Association of Municipal Electrical Undertakings and, furthermore, I did not think it quite right that we engineers should attend this Convention at the expense of the various Councils and there discuss our own salaries. This was put to the Convention for its opinion and the general sense of the Convention was that it was quite in order.

# Salary Scales and Pensions Sub-Committee Report

**Members of Sub-Committee:**

| | |
|---|---|
| Mr. W. N. Powell (Chairman) ... | Bloemfontein |
| Mr. D. A. Bradley ... ... ... | Port Elizabeth |
| Mr. A. Foden ... ... ... | East London |
| Mr. C. R. Halle ... ... ... | Pietermaritzburg |
| Mr. A. Q. Harvey ... ... ... | Springs |
| Mr. G. J. Muller ... ... ... | Krugersdorp |

At the A.M.E.U. Convention held in Johannesburg in April 1944 it was resolved that, arising from item 3.20 of the Convention Agenda—

"It be adopted in principle that a sub-committee of the A.M.E.U. be established to schedule recommended salary scales for the technical staffs of Electricity Power Undertakings for circulation among members and subsequent consideration by Town Councils."

It was resolved that:—

"The above sub-committee also investigate the question of transferring pension fund values between undertakings located in different provinces."

**1. Terms of Reference.**

The terms of reference of the sub-committee are as follows:—

To report to the Executive Council before the next Conference on the following matters:—

(a) *Salary Scales.*

To schedule recommended salary scales for the technical staffs of Electricity Power Undertakings.

(b) To investigate the question of transferring pension fund values between undertakings located in different provinces.

**2. General.**

As a result of the late intimation from the Secretary that the resolution adopted at the April Conference were to be put into effect, and in view of the fact that the deliberations of the sub-committee have been carried out through the medium of correspondence with its attendant delay; it has not been possible to more than briefly touch upon the many points involved in such a controversial subject as salaries.

The circumstances have also been affected by the majority of Chief Engineers being handicapped by shortage of staff, resulting from the effects of the war.

It is hoped, however, that the observations and recommendations will be acceptable to the Executive Council and that these will provide sufficient material to promote useful discussion at the Conference to be held in May next.

**3. Salary Scales.**

The Committee feels that as a preliminary the Associaton's effort should be directed towards establishing a recommended scale

of salaries for Chief Electrical Engineers only, and that this should be confined to undertakings requiring a Certificated Engineer under the Factories, Machinery and Building Works Act, i.e., undertakings having an installed horsepower of not less than 300 (225 K.W.).

It is considered that a recommended basic minimum salary should be £540 per annum for an output of 500,000 units per annum, this being the salary laid down in the Factories Act as a minimum for foremen or managers not in receipt of overtime.

The Committee considers that by using the figure of £540 per annum, for a 500,000 units per annum undertaking as a datum, a curve could be drawn parallel with a curve obtained by plotting the salaries recommended by the Association of Municipal Electrical Engineers and accepted by Chief Electrical Engineers in Great Britain prior to the war. (A copy of the A.M.E.E. curve is attached to this report).

It was found on plotting such a curve that the average increase in salary over the A.M.E.E. scale was £75 and this amount has therefore been added to the A.M.E.E. scale and is included in the recommended salaries given in the scale submitted with this report.

The Committee also observed, that plotting against the A.M.E.E. curve the salaries at present being paid to members in undertakings in the Union, where generating stations are being operated, that these show no uniformity with respect to outputs (see attached curves), This in the opinion of the Committee exemplifies more than anything else the need for recommending the adoption by Municipal Councils of a scale of salaries in which the salaries are related to output.

It is appreciated that the cost of living varies somewhat in the different centres of the Union, but in view of the recommended salaries being in the nature of minimum salaries, it is felt that correction factors could be applied based on published cost of living index figures, if it is considered that this is necessary.

The Committee wish to emphasise that the salaries recommended are pre-war salaries, it being assumed that the higher cost of living arising from the war is being met by "cost of living allowances."

Having reviewed the general principles the Committee submitted the following recommendations for the Council's consideration.

**4. Recommendations.**

*The Committee recommends* that the attached scheme of salary scales and conditions for Chief Electrical Engineers employed in Municipal Electricity Undertakings in the Union of South Africa be submitted to members at the next conference and that if adopted, Municipal Councils be approached without delay in order to ascertain their views thereon.

**5. Transferring of Pension Fund Values.**

The Committee felt that this is not a subject for its attention but one better left to those making a study of this specialised subject.

The Committee understands that the matter of transfer values is a question of getting a transfer clause inserted in any given set of pension fund rules, and it would therefore appear to be purely a domestic matter.

The Committee therefore feels that no good purpose would be served by the Association continiung its interest in the matter, and recommends that the matter be dropped.

## RECOMMENDED SCALE OF SALARIES

**Interpretation.**

(1) The following expressions have the meanings assigned to them:—

(a) "supply authority" means a local authority or any Municipal Council or other combination authorised to supply electricity.

(b) "Chief Electrical Engineer" means an engineer emplloyed by a supply authority as defined in sub-clause (a) hereof and responsible to this authority for the management of the electricity undertaking and the direction and control of the technical and all other staff of the undertaking.

(c) "Chief Electrical Engineer" may also be known in so far as municipal electricity supply undertakings are concerned as City Electrical Engineer, Borough Electrical Engineer, Manager of Electricity Department, Town Electrical Engineer.

**Salaries to be determined by schedule.**

(2) The salary of a chief electrical engineer shall be paid in accordance with the Schedule thereto subject to the provisions hereinafter appearing.

**Unit assessment defined.**

(3) The "unit assessment" mentioned in the Schedule shall mean "the total number of units sold per annum by the undertaker including bulk supplies (hereinafter called 'units sold') and calculated in accordance with clause 4," but subject to the provisions relating to assessment of such units hereinafter contained.

**Assessment of units sold.**

(4) The calculation of the number of units sold for the purpose of ascertaining the unit assessment shall be made by reducing the various classes of units sold to the percentages shown in the attached table.

**Large Consumer Defined.**

(5) For the purpose of this agreement a "large consumer" is a consumer who purchases at one point of supply a number of units in excess of the figure shown in column 2 in the following table opposite to the appropriate group in column 1:—

Provided that where there are special conditions of distribution which make it advantageous for the undertaking to provide a supply to one consumer at more than one point on the same premises such supply shall be deemed to be given at one point of supply for the purpose of this agreement.

In this clause "net number of units sold" means units sold by the undertaker after deducting exported bulk supplies.

**Losses Applied To Units Generated and Purchased Pro Rata.**

(6) There the units sold consist of both units purchased in bulk and units generated, and it is necessary to reduce the assessment of any such units sold in accordance with clause 4, then the units sold be deemed to have been purchaseed and generated pro rata to the total units purchased and the net units generated. For the purpose of this clause "net units generated" shall mean the number of units generated by the undertaker less the number of units used on the works for the purpose of such generation.

**Increments By stages.**

(7) Where on the coming into operation of this Schedule of Salaries payment of a salary in accordance with the schedule hereto involves an increase (hereinafter called the "initial increase") of more than one hundred pounds per annum upon the salary paid immediately prior to the coming into operation of this agreement the undertaker shall have the option of paying the initial increase by annual increments which shall not be less than one hundred pounds per annum except in relation to any final increment which may not amount to one hundred pounds per annum.

Provided that this clause shall have no application to a variation of salary which may be due in respect of each annual ascertainment of the unit assessment, the intention being that the initial increase only shall be subject to this clause.

**New Appointments.**

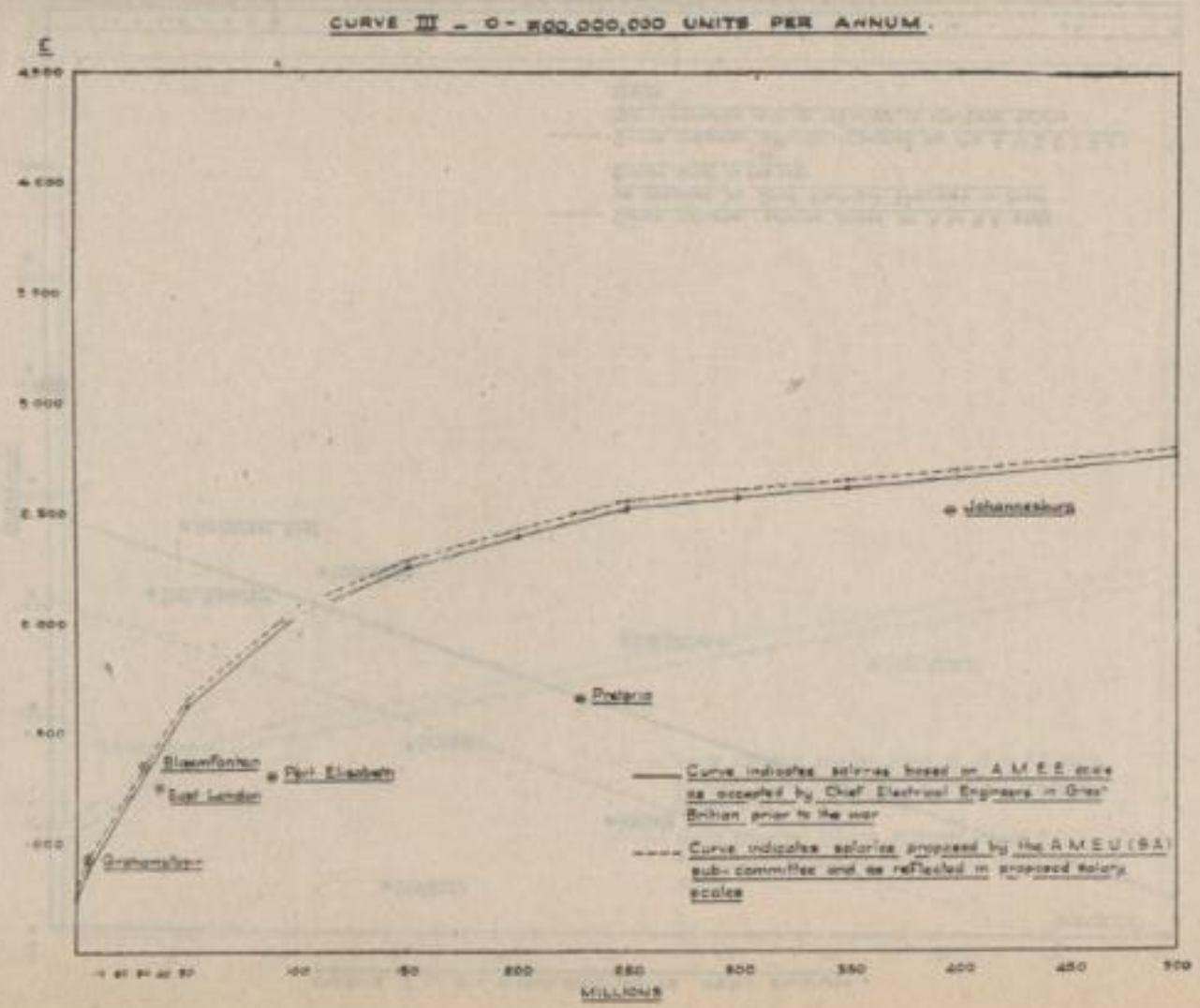
(8) On the appointment of a chief electrical engineer, the undertaker shall have the option of paying a salary of 85% of the scheduled salary for one year, 92 % of the scheduled salary for one year and at the commencement of the third year the full salary shall be paid.

**Protection of Present Holders.**

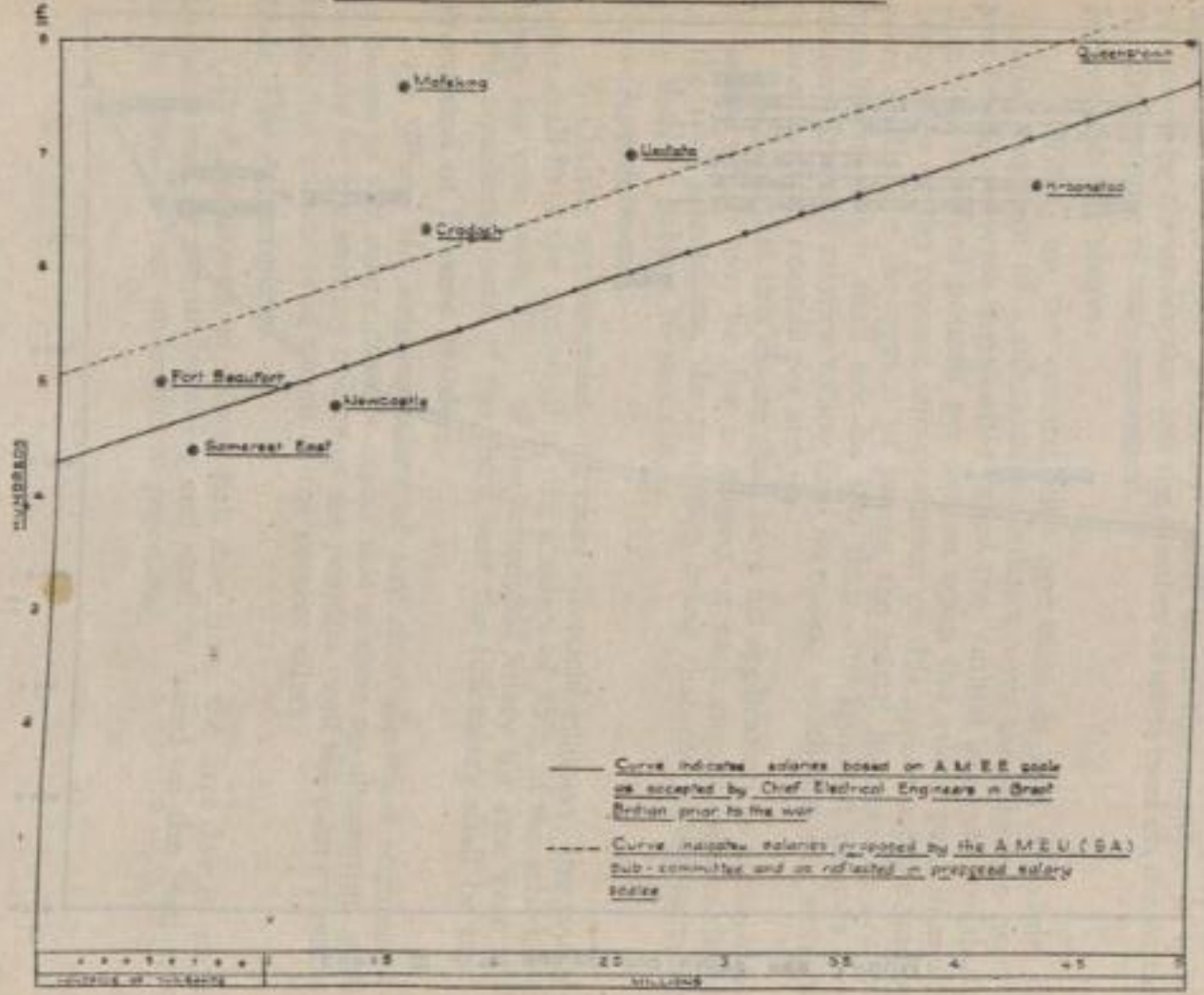
(9) Where the existing salary of any chief electrical engineer is in excess of the salary payable under this scheme no alternation shall be made for the existing holder of the position until the salary payable under this scheme is in excess of the present salary.

**Date For Adjustments.**

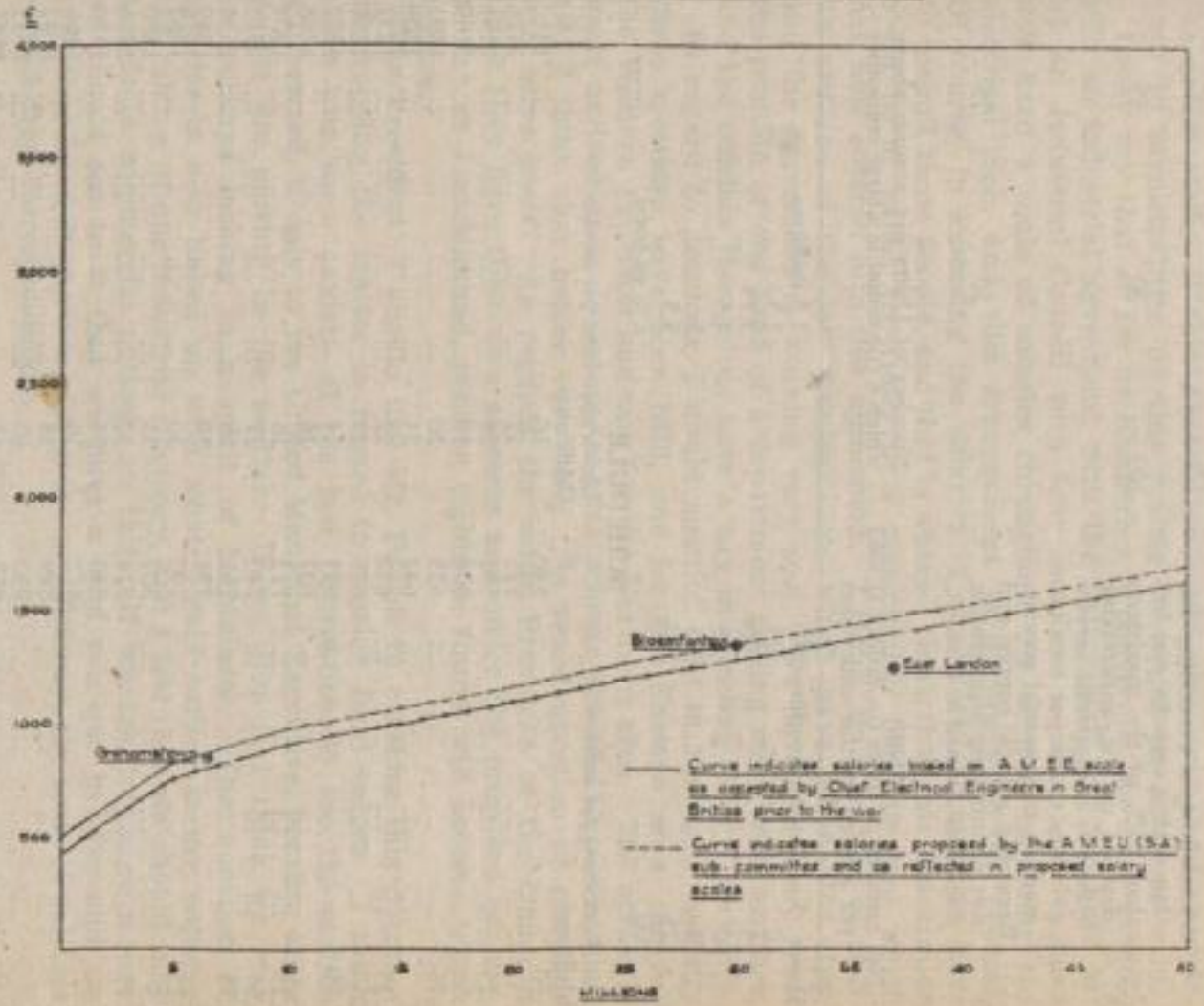
(10) Adjustments of salary shall date from the first day of each financial year of the undertaking and shall be based on the Statistics of the financial year immediately preceding.


CURVE III - 0 - 500,000,000 UNITS PER ANNUM.
£
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
Johannesburg
Pretoria
Bloemfontein
Port Elizabeth
East London
Grahamstown
Curve indicates salaries based on A.M.E.E. scale as accepted by Chief Electrical Engineers in Great Britian prior to the war
Curve indicates salaries proposed by the A.M.E.U.(S.A.) sub-committee and as reflected in proposed salary scales
MILLIONS

CURVE I - 0 - 5,000,000 UNITS PER ANNUM.



CURVE Z - D = 50,000,000 UNITS PER ANNUM.



| Class | Type of Undertaker | Units sold which are generated by the undertaker and are not sold in bulk or to large consumers | Units sold in bulk and to large consumers | Units sold which are purchased in bulk and not re-sold in bulk or to large consumers |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| | | % | % | % |
| A | Maintaining a generating station with a capacity not less than 25% of the maximum demand of the undertaking either in commercial service or ready to be put into immediate commercial service. | 100 | 30 | 85 |
| B | Receiving a bulk supply and not maintaining a generating station as defined in Class A. | | 30 | 75 |

| Group | Net number of units (in millions) sold per annum by the undertaker | Number of Units per annum above which a consumer is a large consumer |
|---|---|---|
| 1 | | 2 |
| | Above 5 and not exceeding 10 | 1.5 millions |
| | „ 10 „ „ „ 25 | 2.5 „ |
| | „ 25 „ „ „ 50 | 3.75 „ |
| | „ 50 „ „ „ 75 | 4.5 „ |
| | „ 75 „ „ „ 125 | 5 „ |
| | „ 125 „ „ „ 200 | 5.5 „ |
| | „ 200 „ „ „ | 2% of total |

## SCHEDULE

| Unit Assessment per annum (Millions) | £ | Unit Assessment per annum (Millions) | £ |
|---|---|---|---|
| .50 | 540 | 16 | 1110 |
| 1 | 575 | 17 | 1128 |
| 1.25 | 592 | 18 | 1151 |
| 1.5 | 608 | 19 | 1169 |
| 1.75 | 625 | 20 | 1191 |
| 2 | 642 | 21 | 1209 |
| 2.25 | 658 | 22 | 1232 |
| 2.5 | 675 | 23 | 1250 |
| 2.75 | 691 | 24 | 1272 |
| 3 | 707 | 25 | 1286 |
| 3.25 | 723 | 26 | 1304 |
| 3.5 | 740 | 27 | 1313 |
| 3.75 | 757 | 28 | 1334 |
| 4 | 773 | 29 | 1349 |
| 4.25 | 790 | 30 | 1367 |
| 4.5 | 807 | 31 | 1380 |
| 4.75 | 824 | 32 | 1398 |
| 5 | 840 | 34 | 1430 |
| 6 | 872 | 36 | 1466 |
| 7 | 899 | 38 | 1497 |
| 8 | 930 | 40 | 1533 |
| 9 | 957 | 42 | 1565 |
| 10 | 989 | 44 | 1601 |
| 11 | 1007 | 46 | 1632 |
| 12 | 1029 | 48 | 1668 |
| 13 | 1047 | 50 | 1700 |
| 14 | 1070 | | |
| 15 | 1088 | | |

| | | | | |
|---|---|---|---|---|
| For each million from | 51 to 100 | inclusive add | £8.1 |
| „ „ „ „ | 101 to 150 | „ „ | £4.5 |
| „ „ „ „ | 151 to 250 | „ „ | £2.7 |
| „ „ „ „ | 251 to 350 | „ „ | £0.9 |

**The President:** Gentlemen,—I think we are indebted to this committee for the work it has carried out. I submit that this is something on which this Association should definitely make recommendations.

**Mr. Eden:** Mr. President and Gentlemen,—Two years ago the Kimberley Municipality went into this question of salaries with the entire staff. If this Association could give some lead or guidance to municipalities on this matter it would be of great value.

I may say that as far as Kimberley is concerned, we have entered into an industrial agreement with the entire staff and we have set up an Industrial Council with four members a side, and we have now fixed a scale of salaries throughout the service, including the electrical men, and this arrangement is in operation at present. Of course, in assessing the salaries of the electrical men we have to consult those people, and that is where I think that this Association could be of value, especially in a municipality like our own which has now entered into this agreement. I think, as a matter of fact, we are one of the few municipalities which have taken this step, and the agreement is working very well. We have got away from the position of one head of a department getting more than another, and the officials themselves have a say in deciding salary questions.

In regard to pensions, I would mention that in the Cape recently three meetings have been held, one for the Eastern area one for the Western Province, and one for the Northern area. The arrangement arrived at is to set up a joint scheme for the Cape Province and I think that before very long this vexed question of pensions will solve itself. As regards the other Provinces of the Union, I think they have their own schemes and under the proposed scheme, as far as I understand, pension rights in future will become transferable.

**The President:** I should like Mr. Powell to consider this question of dropping the matter in regard to pension fund values. I think there was some anxiety at the last Convention to see the matter go forward, if only to the United Municipal Executive, because other people are moving in the matter. If we drop it I think we may be perhaps lacking in a spirit of helpfulness. The question of salaries is also linked up with what I said earlier in my paper—the raising of our industrial efficiency, and I feel that we should take a definite commercial outlook on this. If we ask for more money we should see to it that we have a quid pro quo to give and, on the other hand, if there is a drop in our efficiency, the scale of salaries should drop correspondingly.

**Mr. Powell:** Are members in agreement with these salaries? We have been rather guided by the British scale and it may be felt by some that it is not applicable in this country.

**The President:** Would you propose the adoption of your recommendations, and I will formally second it?

**Mr. Powell:** Yes. I propose the adoption of the recommended salary scales.

**The President:** I second that.

**A Member:** Mr. President,—At the outset of the discussion may I draw attention to a clause in the report under the heading of "Salary Scales," where it is stated that £540 p.a. is the minimum salary laid down by the Factories Act for foremen or managers, not in receipt of overtime. I think the reference there must surely be to seeing that they have the required knowledge. Under the Factories Act all managers and foremen who receive remuneration at the rate of not less than £540 are exempted from the provisions of the Act relating to overtime.

**Mr. Powell:** Yes. I am afraid that point has been overlooked in our report.

**Councillor Beckett:** Mr, President,—If one may be allowed to offer a non-technical opinion on this question I would say this: I confess I have always been amazed that you engineers have placed such a low value on your knowledge and skill. I must say I do not know of any other group of professional men in this country who are prepared to accept as little as you apparently are content with. So I think that you yourselves are chiefly to blame. If you were to go forward as a united body of professional men and say that your services were worth this, that or the other figure, I feel certain that no progressive municipality would take exception to it.

**The President:** Would you like me to defer putting the question?

**Mr. Gripper:** Mr. President,—May I offer an amendment to Mr. Powell's proposition that this report be accepted? My amendment would be to the effect that the report be accepted as a basis on which further investigations should be made and regarding which the whole of our Association should have an opportunity of finding out how these fit in. No doubt one or two towns mentioned in the curves are typical but I wonder how they were arrived at. A number of us could quite possibly have fitted in other areas in the figure shewn on the curves—some above and others below. The actual figures, as a scale of recommended salaries, I am afraid I am unable to support. That is to say, I am not disposed at present to support the recommendation as the actual scale to be adopted, but I propose that the report should be adopted by this meeting as a basis for investigation with a view to submitting final recommendations to municipal councils.

**The President:** Do you mean that it should be delayed?

**Mr. Gripper:** Not unnecessarily delayed. But the Executive has before now dealt with matters of this nature, so I understand, and my resolution was intended to give power to the Executive to reach such a stage, if possible, by circularising members and communicating with councils. May I say that in the case of the Worcester Municipality the matter was brought up in connection with the recent re-grading of salaries. With knowledge of the fact that a scale for senior executives was being drawn up by this Association it was decided that the fixing of the remuneration of the electrical engineer should be left over, with the remark by one Councillor that "they will look after themselves." Consequently, there were no salary scales determined for heads of engineering departments in our

particular grading scheme on that account. It was felt, in other words, that Councils could expect professional bodies like ourselves to give a lead in such matters. My amendment does not mean leaving it over till next Convention.

**Mr. Fraser:** I have much pleasure in seconding the amendment.

**The President:** We should have this proposal a little more clearly defined. We have Mr. Powell's resolution.

**Mr. Gregor:** The recommended scale mentions units. In this respect some municipalities purchase electricity in bulk, while others have their own generating station. I think there should be a difference in the salary scales between these two, as there is a big difference in the amount of work and responsibility.

**Mr. Powell:** Mr. President,—The point just raised by the last speaker is covered in the recommended scales. I will read No. 4, "Assessment of Units Sold": "The calculation of the number of units sold for the purpose of ascertaining the unit assessment shall be made by reducing the various classes of units sold to the percentages shown in the attached table."

The unit of assessment is not the units one actually sells. You will see that, if you study this table on page 140.

**Mr. Gregor:** That means you can reduce the minimum salary.

**Mr. Powell:** No. If an undertaking is entirely generating and they import nothing from outside sources, this table applies 100%, but if they purchase all their requirements from outside, it is considered the responsibilities are less and therefore, the units that you are selling must be reduced by 75%.

**Mr. Gripper:** Is your basic figure of £540 reduced?

**Mr. Powell.** No. Let me give you an illustration. Supposing you sell a million units and you purchased a million from outside, you will only be based on 750,000 units and the total applies to 750,000 units.

In regard to the curves, the Western Province members may have queried as to why their salaries are not plotted: the reason is that, unfortunately, the Western Province figures came too late. That is why you do not see either Mr. Gripper's undertaking or Mr. Eastman's.

In all cases these plotted figures relative to South African undertakings refer to supply undertakings where the engineer is solely an electrical engineer, and is not doing the combined duties of town engineer or transport manager. It is impossible to cover complicated cases: these undertakings are those having their own generating stations and not purchasing a bulk supply.

**Mr. Stevens:** Mr. President,—Engineers who manage electricity schemes that have a consumers' servicing and trading section which undertakes electrical contracting work of any magnitude, even to the extent of wiring blocks of flats, have extra responsibilities which should be considered when drawing up any salary scale.

One might say that these men have a double job, just as much as the man who is in charge of generation and distribution.

**Mr. Wright:** I think both Mr. Stevens' point and Mr. Powell's point

in regard to this rather complicated position could be met in this way. Whenever the mention of "salary scales" comes in, the word "minimum" in block letters should be put in front. It would then be made clear that these are only the minimum salary scales.

**Mr. Powell:** Yes, we could insert "minimum" wherever that occurs.

**Mr. Leishman:** At the last Convention the motion adopted was that "the Executive Council of this Association be asked to form a sub-committee to investigate the principle of establishing a schedule of salary scales and that they be asked to submit to Municipal Councils a proposed basis for the scales." In the draft schedule before us the sub-committee has dealt only with the salary scales of the chief engineers and I should like to know if it is proposed to extend the schedule to include the salary scales of the engineering staff in lower grades.

**Mr. Powell:** That is the idea eventually, but we had not sufficient time in the short period at our disposal between the last Conference and the date of this one to deal with all aspects of the question or to get a settled basis to work from. What we felt was that if we could decide on the chief engineer's salary, the others would naturally follow from this datum line.

**Councillor Eden:** In considering this question of salaries, I would ask: is consideration being given to the relationship existing between such officials as town clerks and municipal treasurers? I cannot understand why members of the engineering section rate themselves so low in comparison with these gentlemen.

**The President:** I suppose it is because we are too modest. (Laughter.)

Further discussion was deferred, and the Convention adjourned until 9.30 a.m., Friday, 18th May 1945.

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## FRIDAY, 18th MAY, 1945

**The Convention resumed at 9 30 a m.**

**Invitation from Bloemfontein.**

The President read a letter received from the City Council of Bloemfontein confirming Mr. Powell's verbal invitation to hold the next Convention in that city.

### REPORT No. 11

**The President:** Yesterday, when we adjourned, we were dealing with Report No. 11. At the meeting of the Executive Committee held this morning a draft motion was considered, and I now call upon the mover to put it forward.

**Mr. Gripper:** Mr. President, — It would appear from sounding individual members that this is a matter on which a hurried decision must not be made. But at the same time an unwarranted delay must not be allowed to occur. At the last Conference the decision was that the establishment of a schedule of salary scales should be

considered by a sub-committee of the Council, and that they be asked to submit this to municipal councils as a proposed basis. I submit that we were possibly a trifle hasty on that point, but nevertheless this committee has drawn up an excellent report on which we can talk. But it has not yet got round to all members, or perhaps every member has not had the opportunity of giving it full thought. For instance, I have not received any questionnaire on which I understand some of this information was furnished. I do not know if the majority received some preliminary feelers before this report was drawn up. But I should like to suggest as an **amendment** that the report before us be adopted as a basis on which a scale of minimum salaries should be drawn up, and that the Executive Council be empowered to prepare a suggested final scale to be submitted as early as possible to all members for individual comment. It has been suggested that it should be put forward to the next Convention, but I rather feel that the matter should be dealt with as soon as possible, and not necessarily referred to the next Convention, if the Executive can suggest a suitable means of handling it before the next Convention. The matter will then fall under the original resolution—that it be submitted to municipal councils, but I think members should be free to give their comments during the course of next year.

**Mr. Bradley:** May I take this opportunity to apologise and express my regret to Mr. Gripper for the fact that he was not circularised with the questionnaire; a rather unfortunate mistake arose between us as to our definite boundaries of operation. There may be one or two other areas in regard to which a similar apology is due.

**Mr. Fraser:** I have pleasure in seconding Mr. Gripper's proposal.

**Mr. Theron** (Klerksdorp): Mr. President,—Would it be possible for the Executive or sub-committee to give us some indication how we may proceed in connection with engineers whose duties combine electrical and civil engineering. Some of the smaller municipalities can scarcely afford to pay the full salary out of electricity revenue only. On what basis would you work in that case?

**Mr. Bradley:** Combine both salaries. (Laughter.)

**The President:** Could I suggest that that point be put to the sub-committee and that they be asked to give any comments when they submit their final report. If Mr. Gripper's amendment is agreed to, then the original resolution falls away. Agreed.

## REPORT No. 6

**The President:** You will recall that in dealing with Report No. 6 "Earthing in Relation to Concrete Asbestos Piping," various matters were brought forward which were indirectly concerned with the subject matter of that report. The Executive discussed the matter this morning, and it was decided that the best way to deal with the problems would be by re-appointing the committee with additional terms of reference.

**Mr. Wright:** I should like to point out that this is not exactly a committee, but two delegates who attended the safety precautions

meeting on your behalf, and the resolution which I have prepared for submission is this:

"That the members gathered together at the Salisbury Convention resolve that the Safety Precautions Committee be requested to consider for inclusion in the Wiring Regulations a recommended code of guiding principles in connection with earthing to meet varying circumstances, and for suppliers to provide the consumer with a point to which the consumer's installation must be earthed."

**Mr. Fraser:** I have pleasure in seconding that.

**Mr. Eastman:** The scope of the proposal before us is so wide and may have such far-reaching implications that it is rather difficult to discuss all the possibilities at present. Quite obviously this is a matter which will come up again for consideration at our next meeting, when we see what this recommended code is. If we disagree with the recommendations then, because they are not statutory, we need not put them into operation. I am prepared to support the proposal.

The resolution was put and agreed to.

**Report No. 14:**

# Joint National Electricity Power Board

**The President:** It was decided at the Executive meeting this morning that we would next take this report. I call upon the Secretary to read the report.

**The Secretary:** The establishment of a Joint National Electricity Power Board was fully discussed at the last Conference and a letter setting forth the full advantages of the project, together with the following resolution, was forwarded to the Hon. S. F. Waterson, Minister of Economic Development:

(See p. xiv—1944 Proc.)

**Resolution:** To this end it is now resolved:

"That the Government of the Union of South Africa be requested to establish, at as early a date as possible, a joint National Electric Power Board, upon which this Association would be afforded adequate representation, having executive and advisory powers and the powers to establish local advisory panels where deemed expedient in the Union of South Africa in order to achieve the following objectives:

(1) The pooling of operating, design and administrative experience with a view to a wider adoption of recommended practice and standardisation;

(2) To advise on uniform policies in respect of forms of accounts, methods of charge and forms of tariffs, the regulation of profits and relief of rates;

(3) To advise on uniform policies in respect of local electricity supply regulations and interpretation of Government legislation affecting the electricity supply industry;

(4) The planning and development of rural electrification;

(5) Collaboration with the Fuels Research Board and other relevant bodies concerning the conservation of primary power sources in so far as the electricity supply industry is concerned;

(6) The development of electrical load and consumption of electricity in accordance with the underlying purposes of the Electricity Act 1922;

(7) Introducing measures for the sale of electrical appliances which will ensure that appliances sold to the public conform to specified safety standards;

(8) Making recommendations for the promulgation (by the Governor-General) of regulations in terms of Clause 53 of the Electricity Act (No. 42 of 1922);

(9) The co-ordination, standardisation and acquisition of material, equipment and spares required by electricity undertakings in the prosecution of their functions, and making recommendations to the Director-General of Supplies;

(10) The investigation of national salary scales and pension funds for the personnel of electricity undertakings;

(11) To advise on questions arising from the training of apprentices and other personnel to be employed in the electricity supply industry;

(12) The rehabilitation and absorption of semi-fit and unemployed manpower in the electricity supply industry and collaboration with the Volunteers' Employment Board (Union Gazette Extraordinary—3rd November, 1943);

(13) Calling upon any electricity supply authority, via the Provincial Administrator, to prepare and submit for co-ordination planning and development schemes for the ensuing 5 or 10 years period and making recommendations to the Provincial Administration, Electricity Control Board and Department of Economic Planning concerning such schemes. Where any supply authority has not the necessary facilities to prepare such schemes the National Electric Power Board may request the Provincial Administrator concerned to appoint a competent person or persons to prepare such schemes, the Provincial Administrators in calling for the submission of proposed schemes to lay down the form in which, and specify a period within which, the requisite details shall be rendered;

(14) Making recommendations to the Department of Commerce and Industries concerning the functions of the proposed S.A. Standards Bureau in so far as these concern the electricity supply industry;

(15) Generally co-ordinating, developing and integrating the electricity supply industry in the best national interest and assisting any Government Department or Board or the Provincial Administration in any activity having a direct bearing on the electricity supply industry."

The Department acknowledged the receipt of our communication and mentioned we should be advised in due course whether the Government could see its way to take steps along the lines suggested by our Association.

The Association also received a letter dated 28th September, 1944, from the Private Secretary of the Minister saying that the Hon. S. F. Waterson had directed him to advise us that the chairman of the Social and Economic Planning Council had been asked to express an opinion on the feasibility or otherwise of the scheme, but as yet had not replied.

At the end of March of this year, Mr. van der Walt, of the Department of Commerce and Industries, met Mr. Rodwell in the Secretary's office when he discussed matters arising out of the letter forwarded to the Minister. In the letter referred to he said it was the Department's intention to study the aspects of the Association's request with the idea of making recommendations to the Minister.

Up to the time of leaving Johannesburg last week, the Association had not received an answer, despite a special request to have one in time for the Conference.

**The President:** It would not appear that we have made any progress in this direction: have you any suggestions?

**Mr. Powell:** May I speak on two points? In the absence of my chairman I have been instructed to read two letters which have a bearing on the report read out by the Secretary. These two letters also have a bearing on Reports 11 12 and 14. The matters in these reports arose from the adoption of the recommendation to form a Joint National Power Board. My Council expressed alarm when they read the nature of the resolution and referred the resolution to the Orange Free State Municipal Association, who replied as follows:

"With reference to the resolution adopted at the Conference of the Association of Municipal Electrical Undertakings, held in Johannesburg on 27th April, 1944, and referred by your Council to this Association for an expression of opinion, I have to advise you that the terms of the resolution were duly considered at the Annual Congress held at Harrismith on 15th and 16th instant, when I was directed to state that this Association cannot associate itself with the terms of the above-mentioned resolution. The resolution, which is very wide in its scope, touches on important matters of policy. My Association feels that although the Conference of the Association of Municipal Electrical Undertakings is attended by Councillors as well as officials, before resolutions affecting matters of municipal policy are forwarded to the Government, the various Town Councils should be given adequate opportunity to consider the practical implications of such decisions. Furthermore, in so far as the municipalities of the country are concerned, the United Municipal Executive is the recognised channel of negotiations with the Union Government, and my

Association would very much regret any departure from this practice.

"The Municipal Association is not in favour of municipal electricity undertakings being regarded as a separate entity quite distinct from other municipal departments, and contends that the electricity undertaking of the municipality is as much a "department" of that local authority as any other branch of the service. Conditions of service should be uniform throughout the various departments of the municipality and no exception should be made in the case of any one department.

"The Association is very strongly opposed to the provisions of paragraph 10. The fixing of salary scales is a matter for each Town Council to decide and this power should not be surrendered. Furthermore, in matters involving salary scales, any negotiations that may become necessary should be conducted with the recognised organisation representing all branches of the municipal service throughout the country, namely, the S.A. Association of Municipal Employees.

"Other paragraphs of the resolution which formed the subject of adverse criticism are Nos. 2, 12 and 13."

This is the other letter. It was addressed to my chairman and after a certain amount of preamble, it continues:

"The Council have decided further that you should make it clear to the Congress that the Council are very strongly opposed to the terms of the resolution adopted at the previous Conference of the Association, in regard to the establishment of a Joint National Electric Power Board. Other provisions of the resolution, particularly those dealing with questions of national salary scales and pension funds for the personnel of electricity undertakings, uniform policies in respect of forms of accounts, forms of tariffs, regulation of profits and relief of rates, etc., are also opposed by the Town Council and it is desired that you should impress upon Congress that the Town Council of Bloemfontein would strongly resent any encroachment on the functions, powers and privileges of Town Councils.

"I may point out that the terms of the resolution formed the subject of discussion at the Annual Congress of the O.F.S. Municipal Association when the Congress unanimously resolved not to associate itself with the decision taken at the Conference of the Association of Municipal Electrical Engineers."

**The President:** The matter is now open for discussion. Could someone now move what we should do in regard to the application to the Government for the formation of a Joint National Power Board?

**Mr. Wright:** Mr. President,—May we formaliy put this to the meeting? Bloemfontein is not officially represented here by a Councillor. There may be other Free State towns in a similar position. Bloemfontein, in that letter, is speaking on behalf of the whole of the Orange Free State, through the Free State Executive. I would ask: is it possible for any of the other Free State Councillors to give the reasons underlying their very strong opposition?

**The President:** We have no motion before us yet.

**Mr. Eastman:** Mr. President,—For the purpose of discussion I propose

"That we renew our application and representations for the inauguration of the National Joint Electrical Power Board."

For some thirty odd years we, as an Association, have seen the supply of electricity become more and more a matter of national interest, although operated largely by municipalities. I want to stress that fact. It is not necessarily a matter of parochial interest only, and I think that the work which has been done by municipalities during the war, particularly in supplying electricity for the production of munitions and for the actual defence of certain areas indicates clearly that national interest. Again it is of national interest in the part it plays in setting a standard of living which is obtainable only by the extensive use of electricity at low prices.

Considerations of that kind actuated us in bringing the matter up at the Convention in Johannesburg last year and were accepted by the Association, I think, "nem con." I confess myself astonished, therefore, to hear to-day that any municipal body, representing municipal interests, should find all these objections now. I regret to say that I personally cannot take that decision so seriously as to prevent me from suggesting that we reiterate our representations for the establishment of that Board. (Hear, hear.)

**Councillor Eden:** Mr. President,—I think it will be found that the attitude of the Municipal Executive is all bound up with the broad question of the financial relations between local authorities and the central government. At the Conference held at Port Elizabeth in November much the same point was raised. We were faced with municipalities saying they were not sure that municipalities should approach the Government—that is to say, the Minister of Transport—directly. We hold the view that his Convention of Electricity Undertakings must decide what it considers is good for the nation as a whole, and not solely for the individual. In much the same way as we decided what was good for the nation in regard to civil aviation. That was not the concern of the individual municipality.

I should, therefore, like to support the remarks of the last speaker, and I think this Convention should definitely pledge the Minister to make some sort of statement. I should add that as far as civil flying is concerned, we made a tremendous amount of progress with the Minister of Civil Aviation and Transport, and we are now in process of putting a plan before him. I think much the same thing should be done in regard to electricity. We should keep our eyes on what is good for the nation.

I am of opinion that some step should be taken by the Executive to see that the responsible people of the Municipal Executive in the Orange Free State get this information in its true perspective.

I second the motion.

**Councillor Symons:** Mr. President,—I should perhaps explain that I am not a member of the Executive of that organisation. Although this matter came up, it did not come up in detail. It was a recom-

mendation from the Executive. Very often at these municipal congresses a thing is skipped over without anybody noticing it. That possibly is also due to some extent in the Orange Free State to the fact that we have meetings conducted in both official languages. But there is one point, Mr. President, that I am not clear on, and that is whether these resolutions were submitted to the Municipal Councils and to the United Municipal Executive before they went to the Government. If that were the case I cannot see that the objection should have come up in that light but if that were not so, then I think the wrong procedure was adopted. I feel that co-operation with the Municipal Councils in regard to anything you wish to forward is the right procedure. Because, unless you have co-operation with the Councils, you are divided. But if it goes through these bodies and they object, then you, as an Association, have the right to follow your own course, in a democratic state. But this co-operation would undoubtedly strengthen your hands. Of course, every municipality is quite jealous of its own policy, and when you touch on salaries and tariffs you are touching on a ticklish point, particularly with the smaller municipalities. I suggest, therefore, that if this resolution is carried it should go through those channels and that co-operation should be sought as proposed.

**The President:** Could Mr. Eastman draw up a resumè of the reasons which induced us at the last Convention to propose the formation of this Board? And copies could be sent to all members of the Municipal Executives? What does the meeting think?

The resolution was put and agreed to unanimously.

See page 146.

## REPORT No. 10

**The President:** We were similarly unsuccessful in regard to Report No. 10, which I would like finalised. We attempted without result to obtain representation on the Public Utilities Advisory Committee. I call upon Mr. Eastman to propose the resolution.

**Mr. Eastman:** Mr. President and Gentlemen,— I have pleaseure in submitting the following proposal:

"Whereas this Convention of the Association of Municipal Electrical Undertakings learns with regret of the refusal to grant this Association direct representation on the Public Utilities Advisory Committee, and of the grounds on which such refusal has been based, and whereas this Convention is strongly of opinion that such direct representation is desirable not only to assist in the carrying out of post-war expansion of electricity undertakings, but also to create an effective liaison for the Associations representatives on the Generation and Distribution Advisory Committee, and the Electricity Conductors' Advisory Committee, it is resolved that renewed and urgent representations be made for the direct representation of this Association on the Public Utilities Advisory Committee at the earliest possible date."

**The President:** I formally second the resolution.

Agreed.

**On resuming:**

# Representation on Committees of Mutual Interest

**The President:** Before we take Item 12, you will remember that we discussed this morning the question of the representation of this Association on committees of mutual interest and especially Mr. Dalton's remarks about "interference." We feel that this Association should have a big part to play in these various committees. At present we have no representation and it was decided that we should place before this Convention a resolution covering the point.

**Mr. Leishman:** I do not think I need do more than put the motion:

"That whereas the Association of Municipal Electricity Undertakings is, and has been for the past 30 years the only Association which represents the interests of practically all municipal electricity undertakings throughout the Union of South Africa and Rhodesia; and whereas this Association wishes to ensure that the interests of municipal electricity undertakings are not only adequately safeguarded but developed: Now therefore it is resolved that the Executive Council of the Association be requested to secure representation on such committees or boards as are concerned with the direct interests of municipal electricity undertakings and to nominate representatives to serve until the next ensuing convention."

**The President:** I formally second that. Are there any comments? If not, I put it to the meeting.

Agreed.

**12.00.—A.M.E.U. Co-ordination and Standardisation Sub-Committee.**

# Report of Chairmen, Regional Committees

**The President:** Various matters were referred to Regional Chairmen at the last Convention, which fall into two categories. Some were domestic and others were for submission to the Joint National Power Board, if formed. You have heard this morning that that Board has not been born. In the meantime we should not, I think, unduly delay putting into effect the recommendations which will emanate from various Regional Committee Chairmen, and I suggest that those items which fall naturally to be dealt with by the Power Board should be submitted to it for its information and action as and when formed; but if undue delay obtains in the appointment of the Power Board, the Council to be empowered to take such steps as may be open to it in order to give effect to the recommendations as soon as possible.

I will move that from the Chair and then call upon the various Chairmen to read the committee reports.

**Mr. Eastman:** Mr. President and Gentlemen,—I second that proposal because I regard it as a means by which proposals or suggestions for carrying on and standardising all matters appertaining to the management and operation of electricity undertakings in the past can be dealt with in a meeting of this kind.

As you have observed, some of the matters referred to in the reports are purely of a domestic character and can readily be dealt with as such. Others are domestic matters which, to some extent, we have endeavoured to have attended to for many years, but the Municipal Councils themselves have not at any time shewn any degree of uniformity from year to year. There is certainly at present a want of suitable legislation containing guiding principles, on financial aspects in particular, connected with electricity undertakings, which have never been brought to a head and determined satisfactorily by municipalities. That being so, I venture to suggest that many municipalities would be only too glad to have a lead from some Government authority in these matters.

The resolution was put and agreed to.

**Mr. Eastman:** I venture to suggest that we should still submit our reports. When I made my comments it was with the idea that I would speak to the recommendations and indicate what, in my opinion, were matters which could properly go to the Joint Power Board and those which obviously are matters which could be dealt with much more expeditiously by the municipalities themselves. In regard to the questionnaire I might mention that we did not include South-West Africa in the area covered by the questionnaire. I apologise for that omission, but it did not occur to me that there could be any members of this Association in South-West Africa. At the most I think there could be only one.

I wonder if you desire me to read the whole of this report, which deals with a wide variety of subjects, or should we deal with each matter individually? There is some of this which has nothing to do with the Joint Power Board, and some of it which has nothing to do with anybody else but ourselves. It will have to do with municipalities in so far as the suggestion goes at the top of page 162.

**The President:** Could I suggest that you deal with each of these items one by one and finalise it? Then perhaps the remaining chairmen will speak to that item and indicate their agreement or otherwise and leave Mr. Eastman to be spokesman for all Regional Committees. Agreed.

## REPORT OF CAPE WESTERN AREA

The following report has been compiled by a regional sub-committee appointed in terms of the following resolution of the Association at its Convention held in April, 1944, to make enquiries and report on the undermentioned matters pertaining to the manage-

ment and operation of Municipal Electricity Supply Undertakings in the Western Cape Province, viz.:

"It is resolved that the Executive Council of the Association appoints regional sub-committees of the A.M.E.U. for Natal, the Cape Province, the Orange Free State, Transvaal and Rhodesia for the purpose of reporting on the matters arising from 1.20 to 1.27 of the final draft agenda on a regional basis and that these reports be co-ordinated and acted upon by the A.M.E.U. Executive Council for the purpose of circulating a report to members of the Association in advance of the next Convention at which these matters will be placed on the agenda for discussion and action."

The regional committee for the Western Province consists of Messrs. H. A. Eastman (convener) and H. J. Gripper.

For the purposes of this report the "Western Cape Province" has been taken as the area in the Cape Province west of longitude 24°. All muncipalities in that area who are members of the Association have been consulted in the matters described in the resolution. The report is based on replies from nine undertakings which had been received at the closing date thereof to a questionnaire issued to twelve undertakings early in March, 1945.

Dealing seriatim with the matters set out in the resolution:

**1.20.—Pooling and Co-ordination of Experience.**

It is generally felt, particularly because of the relative isolation of many of the electricity undertakings in South Africa, that there is a real need for the inauguration of facilities for the dissemination and interchange of information, experience and the views of members of the Association.

It does not, however, appear to be generally known that "The South African Engineer and Electrical Review" is the official organ of the Association.

The suggestion has been made that the Executive Council appoint permanent sub-committees in designated areas to submit at regular intervals, say, monthly or quarterly, notes to the secretary of the Association for publication in "The South African Engineer and Electrical Review." If sufficient material is supplied "The South African Engineer and Electrical Review" could then reasonably be expected to set aside a special section of its journal for matters of particular interest to electricity undertakings, such as, for example, financial, technical and legal information and data relating to municipal electricity undertakings.

It is pointed out that "The Incorporated Municipal Electrical Association" of Great Britain publishes its own journal monthly (copies of which are obtainable through the secretary of our Association) which must obviously be of very great benefit to members of that association, and whose contents might well be taken as an example of the kind of information which is of value to municipal electrical engineers in the Union of South Africa.

It is also suggested that facilities should be established for the senior officials of electricity undertakings to meet more often than,

for example, at the annual Convention in order to be able to discuss matters of common interest. Such suggestions contemplate facilities for meeting quarterly by districts.

It is also suggested that at the annual conference one day be set aside for the general exchange of views by all members of the Association as a whole on matters of common interest that have arisen in the various undertakings during the year.

**Mr. Powell:** Mr. President: As chairman of the Orange Free State sub-committee there appears to be some slight confusion as regards the area covered by Bloemfontein. I may say I did write the secretary in the early days of the formation of this committee and suggested that Kimberley be incorporated in the Orange Free State area, and he agreed: it was felt that Kimberley was very similar in many ways to Bloemfontein in regard to its problems generally. It is only about 100 miles from Bloemfontein and, in view of the fact that members could get together on a subject such as this, it seems only natural that Kimberley should go to Bloemfontein, or vice versa. So the Orange Free State Committee consisted of myself, Mr. Rossler of Kroonstad and Mr. Burton of Kimberley. I may add that my committee was generally in agreement with the views expressed by the Western Province Committee, except that we felt that as these matters all appeared in the items covered by the actvities of the proposed Power Board, we should treat them from that point of view, taking it for granted that the latter would be an accomplished fact. So, therefore, we say this:

> "We consider that in order to achieve a greater regional economy in the production and utilisation of electricity, there is a definite necessity for standardisation of requirements, and for the purpose of achieving this object, advisory committees comprising representatives of electricity undertakings in a stated area should be established by the proposed Joint National Power Board, or body having established powers. These bodies would make local investigations and submit schemes to the board."

So this is generally on the lines of the Western Province Committee's investigation, except that we have assumed that the Power Board would be the body that would institute these advisory committees. I am afraid you are asking too much to expect Municipal Councils to bring such bodies into existence and allow members to meet at regular intervals.

## REPORT OF O.F.S. REGIONAL SUB-COMMITTEE

Members: Messrs. W. N. Powell (Bloemfontein), W. Rossler (Kroonstad), C. Burton (Kimberley).

### 1.—General.

As a result of the late receipt of intimation from the secretary that the resolutions adopted at the April Conference were to be put into effect, and in view of the fact that as regards the Orange Free State the electrical engineer members would all appear to be working under the handicap of depleted staffs as a result of the

war, it has not been possible to do more than obtain general comments on the items covered by our terms of reference.

It is hoped, however, that the observations and recommendations submitted will be acceptable to the Executive Council and that these, together with those received from the other regional committees will provide sufficient material to promote useful discussion at the conference to be held in May next.

**1.20.—More Effective Means of Pooling Operating Design and Administrative Experience with a View to Wider Adoption of Recommended Practice and Standarisation.**

We consider that in order to achieve a greater regional economy in the production and utilisation of electricity, there is a definite necessity for standardisation of requirements, and that for the purpose of arriving at a recommended practice in order to achieve this object, advisory committees comprising representatives of electricity undertakings in a stated area should be established by the proposed Joint National Electric Power Board or other body having statutory powers.

These local advisory committees would make local investigations and would submit schemes to the board. The local advisory committees would meet at regular intervals for interchange of ideas, especially from the point of view of expansion of demand, including rural development, inter-connection of supplies and the rationalisation of schemes for hire or hire-purchase of apparatus, assisted wiring, tariff form unification and new tariffs.

**Recommendation:**

**We recommend** that following upon the establishment of the National Joint Power Board, the Board take immediate steps to set up regional advisory committees which committees shall meet from time to time for the purpose of discussing and making recommendations on matters relating to the planning, administration and operation of electricity undertakings in the region which they represent.

**Mr. Bradley:** I think I may say I am in agreement in toto with the Cape Western report. We do experience some difficulty in not meeting more regularly with the members of our particular region. I do not know if Councils would allow us to meet at intervals on common ground somewhere. But that is a matter for debate and presumably Councillor members will take part. Otherwise the Cape Eastern and the Cape Western agree.

## REPORT OF CAPE EASTERN AREA

Following the resolution of the Executive Council of the Association that regional sub-committees be appointed to report on the matters arising from Items 1.20 to 1.27 as appearing in the proceedings of the last Convention held in Johannesburg in April, 1944, the appended co-ordinated report gives the opinion expressed by the members of the Cape Eastern area, viz., Messrs. D. A. Bradley (Port

Elizabeth), F. Anderson (Port Alfred), H. R. Bevington (Middelburg, Cape), T. J. Coppin (Walmer), A. Elliott (Uitenhage), and A. Rossler (Cradock).

**1.20.—Co-ordination and Stabilisation.**

All members are agreed that "The South African Engineer and Electrical Review" should be used more extensively to exchange experiences and submit problems actually encountered in the running of electrical plant and apparatus under their charge. Suggested headings could be: (1) "Electrical plant problems," (2) "Notes on distribution of electricity," and (3) "Notes on wiring."

**Mr. Wright:** In regard to the Transvaal, circulars were issued to every member in the Transvaal, but up to the date of going to press actually there was only one circular completed and returned. Subsequently I received one more from Johannesburg, which is very comprehensive and which I think should be heard by this meeting.

**JOHANNESBURG REPORT**

**General Aspects:**

While this question at first sight appears to be one of great complexity—possibly so great as to cause some electrical engineers, who are harassed in many other directions at present, to despair and lay the matter aside—maturer consideration affords more appreciation of its extraordinary importance. To-day the electricity supply industry is on the threshold of an era of development which possibly has no precedent for extent, more particularly in view of the huge demand which has been dammed up during the war period due to restrictions both on building activities and the importation of electrical appliances.

A further consideration is that the experience of the past twenty years has quite definitely established the benefits to be secured from inter-connected or "grid" networks each capable of extending over many thousands of square miles of territory. Even the small village community and the individual farmer is demanding a supply of electric energy and such supplies are likely to become more matters of course in the ensuing twenty years of progress. Modern transport, as throughout history, has brought increasing recognition to rural dwellers and their essential needs besides spreading urban populations.

Such being the case this young country does well not only to be keenly aware of these future potentialities but also to accept the lesson offered by the older countries which had to spend tens of millions of pounds to convert a large agglomeration of independent non-standard electricity supply systems to new standards capable of incorporation in the national grids.

In these proposals for various forms of standardisation, therefore, there lies inherent the possibility of saving this country considerable sums of money. To this end, the Government has already taken the initial step of appointing the Electricity Control Board as far back as 1922, so ensuring the standardisation of the most important items of frequency, number of phases and voltages. As was revealed

in the discussions at the 1944 Convention concerning the establishment of a Joint National Electric Power Board, this Association is becoming more conscious not only of its responsibility for laying out municipal electricity networks to conform to the general national pattern, but also of the assistance which one municipal undertaking may be to another in the many further aspects outlined below. It is only in a spirit of unstinting co-operation between Association members, carried out with even more vigour than in the past, that this Association can build up a sufficient record of achievement as a backing to its desire to have an audible voice in the electrical affairs of the country. The following items constitute one of the major gateways to such prospects.

**1.20.—Pooling of Operating, Design and Administrative Experience.**

The thought underlying this clause is that there are many undertakings dotted about the country which have had experience, successful or otherwise, which would be of value to other undertakings if means could be provided for disseminating such experience. Having ensured that all municipal electricity undertakings do in fact subscribe to "The S.A. Engineer and Electrical Review," part of this class of experience might well be conveyed through the medium of this journal. There are, however, items which are unsuited for publication in so public a periodical and which might more suitably be circulated in cyclo-styled form among members only. In order to re-awaken and foster members' interest in the Association and give a fillip to its activities it is perhaps worth considering the establishment of a quarterly circular covering current municipal electrical activities, reports of sub-committee progress, exchange of operating design and administrative experience, notes on legislative measures, purchasing information including disposal of redundant stores of value to smaller undertakings, etc. Such a scheme might prove feasible if the various undertakings would be prepared to send in properly edited contributions to, say, provincial representatives at regular intervals to be forwarded to and circularised by the secretary in due course.

**The President:** Perhaps Mr. Stevens could report for Natal in the absence of Mr. Kinsman.

## REPORT OF NATAL AREA

As the representative of the Standardisation Sub-Committee, I prepared and dispatched to all Engineer Members in Natal a questionnaire (copy attached). The only replies received were from Messrs. C. R. Hallé (Pietermaritzburg), F. Stevens (Ladysmith) and C. Kinsman (Durban).

The views expressed by the above-mentioned gentlemen are summarised below, under the appropriate headings:

**1.20.**—Three suggestions were put forward:

(1) The more effective use of the Association's official organ, "The South African Engineer and Electrical Review," by the

establishment of a correspondence section in which a provocative letter on some aspect of our work as municipal electrical engineers might call forth replies and in which a "question and answer" feature could be incorporated.

(2) Fuller use of the Official Municipal Year Book by including further information on administrative details such a policy in regard to payment in relief of rates, meter reading by Treasury, collection of revenue by Treasury, etc., and by including more complete constructional data.

(3) By devoting at least one day at each Convention to informal group discussions on various subjects such as tariffs, wiring regulations, Factories Act, rural supplies, etc.

**Councillor Eden:** I notice that Kimberley is listed as part of the Orange Free State (Laughter). We, however, represent a region known as the Northern Cape, which is defined, and I should like to suggest that so far as that is concerned it should be the Orange Free State and the Northern Cape. Then you will bring in Vryburg, Mafeking and so on. By that means you get a homogenous mass.

As regards the difficulty of meetings, it occurs to me that one of the methods by which you might achieve some improvement would be this: All over the Union are regional organisations. We ourselves have a Northern Committee, and at these meetings various matters are discussed. For instance, one of our difficulties is the lack of coal and our Mr. Burton, as well as his predecessor, have taken the opportunity at the Conference, held in October—about six months hence—to stress the value of power undertakings. It occurs to me that when these conferences are held in the Cape Eastern, Western Province, Orange Free State, Natal and Transvaal, and so on, the various engineers in the electrical field might take it upon themselves to see that the Councillors who attend these conferences get some information on the lines indicated by these reports. Then you will be getting at the set of people you wish to interest, because it is customary to send the electrical engineer and the chairman of the department concerned to these conferences. By that means you might light a spark in the right place. So I suggest that when these conferences take place, there should be some items dealing with electrical undertakings, and the engineer of that town where the conference sits should make himself responsible, while the smaller undertakings represented make themselves acquainted with what is going on.

**Mr. Powell:** I feel that Councillor Eden is not quite aware of what we are discussing under this item. This is purely a technical matter. The item is: "The more effective means of pooling operative design and administrative experience with a view to the adoption of co-ordinated practice and standardisation." The question is therefore not so much the need for a more happy relationship between ourselves and other bodies. The object is, of course, to try and achieve certain standard requirements with a view to reducing the cost of electricity supply, and it seems to me that

one would not achieve that object by publishing articles or inviting discussions through the medium of the technical press. We have plenty of journals and plenty of literature which bring us ideas in regard to this matter from other countries and other centres. This is something which must be tackled by some authority with statutory power. Talk will not get us anywhere.

**The President:** Here I am afraid I must cross swords with Mr. Powell to some extent. The idea was not entirely technical. I had something to do with putting forward this suggestion at the last Conference and, besides being technical, it was to be a co-ordinating conference. There are administrative problems, too.

Could we now reach finality on this matter? To do that, might I suggest that the various reports be co-ordinated by your Executive and a circular sent round to every member setting out what they consider to be the best means for achieving better pooling and co-ordinating of experience, and that it be left to the engineers responsible to take the matter up with their Councils, and to ascertain if this latter example of meeting regionally on occasions be approved.

Agreed.

**Mr. Fraser:** Before you pass on, Mr. President, it is all very well referring everything we discuss to the Executive, but this only meets once a year, and that at the same time as the Conference. It seems to me that some machinery should be brought into being whereby whatever we leave over from a Conference may be taken up and brought to finality. Under our present system, I am afraid that very little is done until the following Convention. Is it possible for regional committees to meet every quarter? On the Reef, of course, we have quite a number of municipalities in close proximity and I am sure that such arrangements would not be difficult. Should we not approach our various Councils and recommend that more regular meetings should be held to discuss important matters.

**The President:** Yes, we must have something constructive. There are difficulties, I admit. Can Mr. Fraser suggest some means?

**Councillor Eden:** Why not form an action committee, or sub-committee of the people on the Reef to carry on?

**Mr. Gripper:** It would appear, as Mr. Fraser points out, that the Executive meets only as often as the Convention. Then it will undoubtedly be difficult to arrange for regional committees to meet, because they will have no authority or centre to report to. But I would suggest, Mr. President, that there would seem to be some scope in the proposals put forward in your own presidential address, namely, that the organisation of this Association may require quite drastic reforms: that given the financial means to acquire suitable office accommodation, a full-time secretary, and so on, a great deal more can be done than at present. The question is, therefore, one of decentralisation. So it would appear that we are rather wasting time discussing the formation of regional committees while we lack a permanently established central authority.

# "C. M. A."

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**The President:** Could I suggest to Mr. Eastman that he might undertake the work of co-ordinating these regional reports and sending a circular to the members of the Executive, who could approve by correspondence, and it could thereafter be sent round to all members?

**Mr. Eastman:** I shall be pleased to undertake this work.

**Mr. Wright:** I venture to suggest that we are taking an unfair advantage of Mr. Eastman's willingness. Whenever there is a job to be done, he appears to be given it and, of course, he accepts. That is all very well. It has been suggested that there are different ways and means by which this Association can go ahead and achieve progress. To me it appears that there are only one or two alternatives: either the Executive must meet more frequently, or you must delegate your powers to those members of the council who are located together, as was more or less the case in the war years. Then you appointed an advisory committee on the Reef, and I think that did very well. No definite decisions were taken by them; all their recommendations were submitted to the other members of the Council for their criticism or approval. These criticisms were then co-ordinated and you got your final report. In that way the work of the Association was carried on.

Mr. President, I personally think that the best way would be more frequent meeting of the Executive. That avenue should be explored very fully. Failing any results from that, I feel that you must delegate powers to a few members who are closely situated together.

**The President:** You will doubtless remember that the advisory committee was created by the Executive and the reason it was continued was stated by your late president, Mr. Rodwell, who pointed out that the Executive has power to co-opt any members for particular purposes and I think that could have been done on the Reef. There will be a number of items of this nature and we might possibly distribute them among members.

**Mr. Fraser:** I should like to thank Mr. Eastman. My criticism was not lodged in an effort to put the work on to another centre. I agree with Mr. Wright that on the Reef there are a number of members who could get together to discuss matters of importance and I would like to see this organised. That was my point.

**Mr. Powell:** I confess I am getting more and more confused. I thought that this matter arose out of the motion at the last Conference. I would just like to read this to you:

> "To this end it is now resolved that the Government of the Union of South Africa be requested to establish at as early a date as possible a Joint National Electric Power Board."

In the objects listed were included these items. I thought the idea was that a Power Board would be formed one of these days and the object of all this was to give the board a lead.

**The President:** Is it not all bound up in the resolution we agreed upon that we would divide the reports into those items we could deal with ourselves, that is, domestic matters, and those others which must be referred to the Power Board? This is one which, in

our opinion, need not necessarily be put to the Power Board, and therefore we propose that it be dealt with domestically. Of course, if we could get a more definite result from the Power Board, by all means let us refer it to them, but as we have at present no such organisation, we have decided to do it the other way, pro tem. In any case, it will take some time. I mean these things—pooling of experience, standardisation, and so on. The others are being dealt with one by one.

**Mr. Eastman:** It seems to me we are dealing with three different subjects. First of all we are dealing with publicity. Firstly, all realise now that we have an organisation at our disposal for publicity. The second point is the provision of facilities for certain officials to get together. The machinery to do this may well prove difficult to operate. This clause essentially proposes that engineers, or the Association, should put it to the Councils that the desirability exists for arranging for facilities to be given to their engineers to meet more frequently. The third point we are considering is that a whole day be set aside for the discussion of miscellaneous items that have been set out specifically in the agenda by the Council, on which it will be interesting to hear the views of delegates.

**The President:** I think Mr. Eastman has summed up the position very well. You cannot reach finality until you know if the Councils will support these ideas. We want to know if there will be support for these regional meetings. I think it is agreed to accept Mr. Eastman's offer to do this job. Is that so?

Agreed.

# Standardisation of Plant, Equipment and Spares

**Mr. Eastman:** In regard to the item 1.21, "Standardisation of Plant, Equipment and Spares," it is considered that standardisation of the sizes of units of generating plant and also of transformers is desirable, and that in the interests of reliability in performance and safety in use and in overall economy all plant and equipment and all materials used in connection with the generation and distribution of electricity should conform to recognised standards of quality and design such as those provided by the standards specifications issued by the British Standards Institution, many of which have already been adopted as South African standards.

It is suggested that the proposed South African Standards Bureau should in due course interest itself in the matter as the natural body to promote legislation making it obligatory for all goods of the kind referred to above which are sold in the Union to conform to the relevant British or South African standards. It is suggested that, with the object of preventing the sale and purchase of articles of quality inferior to the prescribed minimum standard, legislation be introduced to cover also all appliances and wiring material used in electrical installations.

It is considered that it would be in the interest of consumers that articles such as plugs and sockets, fuses, fuse holders, switches, lamp holders, hot plates and other types of heating elements and other types of apparatus commonly used by consumers should be standardised as far as possible in respect of physical dimensions also, and in the case of hot plates and other heating appliances it is thought that benefit would be obtained by standardising the ratings of the elements on a few commonly used loads in the same way as has been done, for example, in standardising incandescent lamp ratings at 40 watts, 60 watts, etc., so eliminating numerous intermediate loadings which do not serve any useful purpose.

It will be remembered that for years past our Association has interested itself in the extreme difficulty which exists in preventing the sale of inferior electrical appliances which not only may make for a lack of safety, but which also create a sense of disappointment to consumers who use such appliances, because they are unreliable. But hitherto there has been no obvious door through which we could go to achieve our object in preventing the sale of these appliances. However, at our last Convention it will be recalled that we had a paper by Dr. Bosman, from whose remarks concerning the proposed Standards Bill we understood that an opportunity would soon arise to put our house in order in that direction. In other words, it seems that machinery to bring this desideratum into operation is now, or soon will be, in existence.

**The President:** Will the remaining chairmen now report.

**Mr. Powell:** We in the Free State are generally in agreement with the views expressed by the Western Province Sub-committee in this matter, although I would like to stress that it should be clearly understood that we are not in favour of standardisation of design, since we feel it would tend to restrict the introduction of new designs and methods, and so retard the development of electricity supply engineering in general. We consider that an attempt should be made to standardise requirements. For instance, there should be an attempt made to reduce the number of different voltages, steam pressures, temperatures, and so on. Our report is as follows:

**1.21.—Type of Plant, Equipment and Spares.**

In our consideration there is a definite need for rationalisation where plant and equipment are concerned.

At the present time the range of steam pressures and temperatures, capacities of units, types and voltage of plant required is almost infinite, as is also the range of refinements in the shape of instruments for switchboards, turbines, boilers, etc.

We consider that an attempt should be made at standardisation of requirements in order to decrease the range of items to be designed and manufactured but we are not in favour of standardisation of design as it is felt that this would tend to restrict the introduction of new designs and methods and so retard the development of the art of electricity supply engineering.

It is considered that in a given undertaking considerable advantages may accrue from standardisation of individual items of equipment such as turbines, boilers, switchgear cables and transformers, this making it possible to reduce stocks of spares to a minimum.

Under this item the question of regional purchasing and the establishment of regional pools for the central stocking of standard items such as transformers, switchgear, cables, etc., might be considered.

**Mr. Bradley:** We more or less agree with the Cape Western, but the Eastern Area is more concerned about what I may call the generating plant. As you will see from my report, we advocate a standardised horse-power rating in accordance with requirements, and suggest that prime movers and alternators cannot be standardised, as that would stop progress. Further than that, the Cape Eastern area suggest that plugs, sockets, fuses, switches, lamp holders and so on could be readily standardised, but they fear that manufacturers would not cede their patent rights to pool production for the common good. From this meeting we may get some expression of opinion on that point and in that way get a lead. We have to report:

**1.21.—Types of Plant, Equipment and Spares.**

Standardisation of prime movers and alternators not advocated; unrestricted design is considered essential to meet all conditions both from manufacturers' and purchasers' viewpoint. Rating of prime movers could be usefully standardised, e.g., prime movers between 300 h.p. and 1,000 h.p. in steps of 50 h.p., or generating sets, complete, to be of standard output, such as 100KW, 250 KW, 500 KW, 1,000 KW, 3,000 KW, 6,000 KW, 10,000 KW, 12,500 KW and 30,000 KW; steam pressures could be standardised to advantage, e.g., 100, 200, 400 and 600 lbs. per sq. inch. It is suggested that such standardisation would not affect initiative and progressive design, but would, in turn, tend to reduce prices or costs of other ancillary materials and apparatus that must be used before any scheme or installation is available for full use, such as switchgear, metering equipment.

Most of the Cape Eastern area members favour the standardisation of electrical appliances, such as plugs, sockets, fuses, switches and lampholders; the plugs to be of the three-pin type, 5 and 15 ampere capacity, with all component parts being interchangeable, irrespective of the actual manufacturer. This, if possible, would reduce installation costs and reduce the amount of spares to be carried, but it is presumed that manufacturers would not concede their patent rights to pool their production for the common good.

**Mr. Wright:** In regard to this matter I think I can say that I concur with the other two speakers: except that I would like to emphasise that, in my opinion, we should do something about the "bazaar" type of electrical material which is commonly sold. That is something which I consider should be definitely ruled off the market. The sale should be prohibited unless it complies with a certain minimum standard. Johannesburg reports as follows:

## STANDARDISATION OF PLANT, EQUIPMENT AND SPARES

It is pertinent to bear in mind the tremendous success which has attended the efforts of the British Standards Institution in co-ordinating consumers' requirements to rationalised manufacture by eliminating unnecessary sizes and quality grades and enabling manufactures to build up stock items with confidence. Since the standards endeavour to confine themselves to range of sizes and qualities and the standards of performance they leave freedom of initiative, invention and production methods.

Bearing in mind the introductory comments on the increasing adoption of grid networks, it would appear that the A.M.E.U. could very usefully extend these underlying principles of standardisation among its members. It is not for a moment intended to suggest a slavish following of rigidly defined types of plant; since cases do arise where a particular job has to be specially "tailored." What is suggested is that the A.M.E.U. Standardisation Sub-Committees lend their efforts to establishing schedules of recommended standards for equipment and spares on distribution networks which should be adopted unless very special and definite reasons dictated the contrary.

To give a few indications of the more important factors affecting rapidly expanding of inter-connected networks:

(1) "Primary" and "secondary" standard h.p. voltages should be considered with means for ensuring that networks which are sufficiently close geographically as to lend prospect of ultimate inter-connection (even as far as 20/30 years ahead) are developed on parallel guiding principles.

(2) This would have to include careful consideration of transformer connections.

(3) In view of the rapid rate of development of generator capacity on most systems, and particularly where large capacity inter-connection are affected, the rapidly increasing fault capacities are causing circuit-breakers, particularly individual consumer's E.H.T. cubicles, to obsolesce with unusual rapidity due to inadequate rupturing capacity.

(4) Another important aspect of standardising certain classes of plant among municipal electricity undertakings is the prospect of securing these at lower prices. Moreover, the gross total of spares carried need not be so great and provision might be made among municipalities for mutual interchange of certain spares, obtainable only ex import, in emergencies.

(5) In regard to house service equipment and standardised wiring regulations, the A.M.E.U. could perform an extremely useful function by fostering the adoption of a rationalised range of types of such equipment throughout the country to assist in (a) giving locally manufactured equipment a better chance of developing only definitely approved articles, and (b) stemming the indiscriminate sale of trashy or unsuitable appliances both of local and overseas manufacture.

**Mr. Stevens:** In Natal we are in favour of a considerable degree of standardisation in regard to distribution plant accessories. Our convener's report reads:

The three members who replied to the questionnaire control undertakings which purchase energy in bulk; hence their replies deal only with distribution.

It is generally felt that there should be a considerable degree of standardisation in distribution plant and accessories.

**The President:** This item is now before the meeting for discussion. This will, however, have to go to the Power Board as and when formed. We cannot create legislation for this. Do you agree that this be passed to the Joint National Power Board when formed?

Agreed.

**Mr. Eastman:** We now come to Item 1.22, "Standardisation of Voltages." The Cape Western report is:

**1.22.—Standardisation of Voltages.**

All but one of the undertakings consulted give supply at the present time on the South African standard low tension distribution system, namely 380/220 volts, three phase, four wire. No serious objection is offered to a change in voltage to the 400/230 volt, three phase system provided that a reasonable length of time is given for the necessary adjustments to be made. These in the case of most undertakings are expected to occupy a period of, say, up to two years, but in a few cases it is thought that the change-over will take a much longer period.

The only apparent advantage derivable from the change lies in the fact that the 400/230 volt system has been standardised in Great Britain and 230 volts is a standard voltage in America, from both of which countries most of the electrical appliances that will be imported in the immediate future may be expected to come. Accordingly, all such imported appliances would be of a design which has been standardised for use in their country of origin. For that reason they may be expected to give more satisfactory service and prove more economical in use than articles made specially to suit a different South African voltage.

Information is divided on the question of standardising the three-phase, four-wire system for house connections. Some, including the larger undertakings, have standardised this arrangement for all domestic supplies where the total connected load exceeds 3,500 watts and, even if the load is less than 3,500 watts, in premises which consist of four or more living rooms. These undertakings prefer this arrangement to that of two-phase or single-phase supplies on the grounds that a better balance is obtainable as between phases on the reticulation network, and prefer it also from the standpoint of greater reliability of supply to consumers, in that the cutting out of one or even two phases under fault conditions will still enable the consumer to receive at least a partial supply on the remaining two or one phases.

One undertaking adopts the single-phase system for supplies to all consumers whose loading does not exceed 30 amps. per phase, but all undertakings give supply on the three-phase, four-wire system to all premises where such loading would be exceeded.

This is a question as to whether or not any advantage is derivable by a change from the present-day standard. 230 volts is the standard voltage in Great Britain and 230 and 115 in America, from both of which countries, of course, most of our electrical appliances will be imported in the immediate future. Appliances designed for 230 volts manufactured in a country which has had a wide experience in the design and manufacture of equipment of that voltage, may be expected to give more efficient and economic service than appliances made in countries where this is a non-standard voltage.

The report also goes on to state that so far as the Cape Western districts are concerned, no difficulty is expected in introducing a 400/230 volt three-phase system, as long as reasonable time is given to do so. I may say that this point was brought to the fore a little time ago by a certain engineering institution in this country deciding to recommend that 400/230 volts be adopted as the standard voltage, but the proposal was checked when it was realised that our Association was the body which originally recommended 380/220 volts for three-phase supplies. The general impression, however, amongst those who contributed to this report is that there will be no difficulty in changing to 400/230 volts if it is desired to do so.

**Mr. Powell:** We consider that a standard voltage is necessary to cheapen distribution costs and to reduce the cost of lamps and appliances.

The suggested voltage of 400/230 is apparently proposed with a view to obtaining a standard for the British Commonwealth since this is the standard voltage in use in Great Britain and has also, we understand, been adopted in Australia.

It is pointed out that the S.A. Standards Institution has recommended that the existing standard voltage of 380/220 be replaced by the 400/230 volt standard now adopted in Great Britain.

The A.M.E.U. Advisory Council has also already advised its members to support the principle of establishing 400/230 volts as the South African standard for low tension voltage subject to ample time being given for existing schemes to effect this change-over where practicable.

We understand that it has been recommended that the Electricity Control Board be advised that the A.M.E.U. supported the principle that the sanction of all new schemes be subject to the adoption of the 400/230 volt standard.

In our consideration, cost prohibits the immediate standardisation of voltage on existing works and we are of the opinion that there is no justification for recommending such procedure. We are, however, in favour of all new works and extensions to existing undertakings being carried out at the proposed standard.

**We recommend** that steps be taken to immediately introduce legislation to make it compulsory to adopt the 230/400 standard

voltage in all future layouts, new townships, industrial areas, etc.

**Mr. Bradley:** The Cape Eastern area members from Cradock, Somerset East and Port Alfred are in agreement with the adoption of the standard distribution voltage of 400/230. I, personally, would support other speakers at the last Convention and say that all new layouts, new townships, etc., shall be supplied from the 400/230 volt network, but the older cities, including Port Elizabeth, shall not be required to undertake the change-over in any given time, rather that it be left to the engineer in charge to do this as and when opportunity and circumstances permit.

Personally I regret that the 400/230 volt standard was not accepted some two months ago, because in the meantime I have set out three areas on the 380/220 basis. However, I presume we can and will meet the requirements as regards new areas being henceforth standardised at 400/230 pressures.

**Mr. Wright:** I have the following comments from Johannesburg: With the proviso that undertakings already utilising other standards are given adequate time in which to effect a gradual change-over to this new standard, this proposed standard is most strongly supported. Not only is it the standard now adopted in Great Britain but it is exactly twice the American standard with all the consequent advantages of purchasing ex rationalised manufacturing facilities. Establishment of this voltage is, in my opinion, one of the most fruitful starting points for the A.M.E.U. Standardisation Sub-Committee.

**Mr. Stevens:** A standard voltage is considered desirable but the Natal members do not agree with the standard being fixed at 400/230, preferring the lower figure of 380/220. If, however, it is decided that the standard shall be fixed at the higher figure, it is the view that it should apply to only new undertakings in the first instance. Established undertakings operating at any figure other than the standard should be given the choice of two alternatives, viz.:

(a) To be given very considerable Government assistance by way of low-rate loans, provided the change-over is effected within a fixed number of years.

(b) To be permitted to change over as and when circumstances dictate the necessity or permit the policy being carried out.

I am doubtful whether any standard pressure we decide upon now would become universal before there was a desire to change to a new standard. It was only last week I read in the March issue of the BEAMA Journal, under the digest of the British Electrical and Allied Engineering Press, this: "Standard voltage, the case for choosing 240 volts," by J. M. Donaldson, M.C., M.Inst.C.E., M.I.E.E. This indicates that although 230/400 volt has been established as a standard in Great Britain, there are people advocating a different standard. I am of the opinion that we in South Africa should stick to 220/380 volt as a standard, for with this pressure 230/400 volt domestic appliances will work satisfactorily.

**The President:** I suggest that in view of the lack of unanimity

of opinion, this is a matter which should be submitted to the Joint National Power Board when formed, and I move accordinly.

Agreed.

## 1.23.—STANDARDISATION OF ELECTRICITY SUPPLY REGULATIONS.

**Mr. Eastman:** Item 1.23 is on the question of the possibility of the standardisation of electricity supply regulations. The report is as follows:

It is considered desirable that as high a degree of uniformity in electricity supply regulations as possible should exist. If it is impracticable to obtain absolute uniformity amongst places situated in different Provinces because of differences in provincial legislation, then uniformity should be aimed at in respect of undertakings in each Province taken separately.

As an example of what can be done in this way, attention is drawn to the recent standardisation of regulations for the wiring of premises. It will be remembered that draft standard **supply** regulations were prepared by our Association at the same time as the draft **wiring** regulations and were submitted for consideration at our Conference in Salisbury in 1934. They were separated from the wiring regulations later only because it was felt that more delay might ensue in obtaining general approval to them than to the latter and, as it happened, the method finally adopted in the publication of the standard **wiring** regulations was not readily applicable to standard **supply** regulations.

The draft standard **supply** regulations, however, as submitted to our Conference in 1934 with the draft standard **wiring** regulations, were based on the model supply regulations as first drafted by our Association in 1920 with amendments bringing them up to date in accordance with modern requirements, and they have in fact been adopted with very few amendments by at least one large municipal electricity undertaking in the Cape Province.

It was realised that there might be a difficulty in standardising supply regulations, and for this reason when the proposed standard wiring regulations and supply regulations were submitted to the Association for approval in 1933, it was decided to concentrate only on **wiring** regulations in the first instance. The report recommends the **supply** regulations of an undertaking should be uniform.

**Mr. Powell:** I have no comments other than to say that we were not aware of the fact that the A.M.E.U. had in the past framed a set of regulations. Therefore we say this:

We consider that the domestic regulations of municipal electricity undertakings should have a uniform policy as this would assist in the administration of electricity departments and assist materially such interested parties as electrical contractors, the Public Works Department, Railway Administration, etc.

It is considered that a set of model conditions of supply could be framed under the auspices of the A.M.E.U. to be known as

the A.M.E.U. Model Conditions of Electricity Supply in South Africa to be used as a model and guide for all undertakings.

In the matter of interpretation of existing and future legislation governing electricity supply, we consider that the A.M.E.U. shou'd be used as a medium for obtaining opinion on the legal interpretation of the various enactments and regulations and as a channel through which cou'd be obtained expressions of opinion from other undertakings. In achieving this object advantage could be taken of the Executive Council, the official organ of the Association, "The South African Engineer and Electrical Review," and the annual conferences.

But it would appear that such a set does exist and I should like to know if it is avai'able on demand.

**We recommend** that steps be taken by the A.M.E.U. to frame a set of model domestic regulations for the supply of electricity.

**Mr. Eastman:** The Secretary has a copy which belongs to the Association and copies were issued to every member of the Association in 1933 for their comments.

**Mr. Bradley:** I too would like to see a copy of those regulations. Our report reads: All the Cape Eastern area members support the uniformity of electricity supply regulations and consider it advisable to use the standard regulations for the wiring of premises and have them made compulsorily applicable to the whole of the Union and the Rhodesias, but in addition each municipality to have its own set of regulations covering any special or pecu'iar conditions to suit local requirements.

**Mr. Wright:** We have to report the following: The standard wiring regulations constitute a very large step forward in rationalising the supply industry of this country and elasticity has been provided for by allowing individual authorities to promulgate supplementary regulations suited to the special requirements of their areas. Although it wou'd be entirely impracticable to produce a single set of standard regulations covering every requirement which would be suited to all undertakings, this becomes more practicable with the passage of time. For the present it would probably be advantageous to incorporate in the standard regulations further clauses dealing with high voltage, particularly for h.p. consumers' chamber layout, service connections, etc.

Because the Electrical Wiremen and Contractors Act (1939) is an Act of Parliament and not a provincial matter and because of the difficulties which are already arising as between different towns on the Witwatersrand in respect of electrical contractors who have businesses in one town and wish to undertake work in another, it is that considerable advantage would accrue from incorporating standard provisions throughout the Union in by-laws governing electrical contractors.

Viewing the recently promulgated measures governing electricity supply on a national and not provincial basis, e.g., the standard wiring regulations, the Factories Act (1941), the Electrical Wiremen and Contractors Act (1939), the time seems to have arrived for

pressing for the repeal of those parts of the Local Government Ordinance which give rise to difficulties in applying the national measures or to variations between Provinces. For example, the Transvaal Provincial Ordinance includes clauses preventing the charging of a licence fee to "electricians" in which definition electrical contractors may be deemed to fall.

**Mr. Stevens:** In Natal it is felt that local authorities may insist on their own policy in regard to contractual supply regulations as apart from technical wiring regulations. Subject to this, it is felt that there should be a greater degree of uniformity than exists at present. It has been suggested that an effort be made to collect all supply regulations with a view to members being made aware of all points upon which there is general agreement.

I consider that a uniform set of supply conditions for all suppliers of electricity would be a good thing, as in the event of disputes the interpretation applied to clauses in various courts could be used in settling the argument. Furthermore, there is little doubt that before long such regulations in Natal will have to be in both official languages and having one set of conditions for all means that difficulties in connection with translation will be simplified.

**Mr. Gripper:** Mr. President,—I have had experience at Worcester in drawing up a set of regulations applicable to our own local conditions. We started about four years ago by keeping a folder in which we noted difficulties with which our 1916 regulations did not deal. I may say that 1916 was the date when the Worcester Municipality drew up its supply regulations—I think they were based on the original regulations to which Mr. Eastman referred. The position to-day is such that after three years struggling with this matter, and after calling in the assistance of the legal department of the Cape Administrator, that department in turn referred the matter to the Electricity Supply Commission. It appears that the latter body is prepared to draw up a set of regulations for any municipality on payment of a fee, but I felt that locally we had a number of things with which no standard code would properly deal. This is due to normal progress, the appearance of radios, modifications in design and so on. I may add that the Electricity Supply Commission still acts as technical adviser to the Administrator, and they still collect the fee. The result is that this set of regulations which we have drawn up is a most expensive affair.

I have been reading some of the replies which the local committee has received from various undertakings. One says: "Why continue with the present slipshod method if there is a remedy?" The fact is that many regulations are a matter of chance — they have been copies from other regulations, which have later been found inapplicable or ultra vires. I myself have copied one or two from other centres, only to be told they are ultra vires.

My reply to our questionnaire was that all regulations at present in force should be scrutinised by a sub-committee having legal assistance, this to be done first in each Province, and then nationally with a view to getting a uniform code as far as possible. In other words,

if the Provinces could get together first and pick the best out of their regulations, our proposed Joint Power Board might then be ready and could give us a basic code.

**The President:** Is it your point that we should draw up a fresh set of model supply regulations?

**Mr. Gripper:** It is difficult to say at this stage, but I feel that if the existing code is one that very few of us have seen we cannot reply until we have seen it. But I think the time is ripe for a further code to be drawn up. If the last one was in 1934, war conditions have altered things, and I think the next year or two will see so many changes that the last code will be useful only as a guide.

**Mr. Eastman:** The supply regulations of that day have been adopted recently in Cape Town with very few amendments.

**The President:** It might be recommended from the Conference that engineer members obtain copies of the model supply regulations which have been drawn up.

Agreed.

## 1.24.—FORMS OF ACCOUNTS.

**Mr. Eastman:** This item deals with forms of accounts, with which is embodied financial policy. The report is as follows:

The standard forms of accounts, which were drafted by our Association in 1922 and, with minor amendments, were later approved by the four Provinces of the Union for adoption by all municipal electricity undertakings, continue to be used by all but two electricity undertakings in the Cape Province and prove to be satisfactory. The accounts of the undertakings referred to are, however, based on the standard forms.

Although the standard forms of accounts provide for the keeping of accounts for (i) renewals and obsolesence fund, and (ii) reserve and betterment fund, and the *chief clerk in charge of local government audit, Cape provincial audit office, when they were approved for general adoption, fully described the purposes of those funds and the need for establishing and maintaining them, neither the Cape Provincial Administration nor any other governing body has laid down rules either for the compulsion or even the guidance of municipalities on the question as to what amounts should be set aside to those funds annually and at what minimum and maximum figures they should be maintained. As a result of this omission the amounts of the contributions to such funds have in many instances been determined mainly by the requirements of municipalities in meeting their annual commitments on general rating account.

In a few instances it appears to be a recognised practice to spend from revenue a limited amount annually on works of a capital nature, but apart from this and the adoption by two others of the principle of allocating annually to "a renewals and obsolescence fund" a specified sum based on the total capital expenditure, the majority of the municipal undertakings in the area covered by this report have not consistently maintained any fixed policy in regard to these and

other similar financial safeguards against over-capitalising their undertakings.

In this connection attention is drawn to the fact that recognition of the need for provision for adequate financial reserves being established is given in Section 9 of the Union of South Africa Electricity Act (Act No. 42 of 1922) wherein is specified the method in which the Electricity Supply Commission is required to deal with the matter.

It is also considered to be an important principle that the redemption periods of loans raised for the carrying out of works should correspond as closely as may be estimated to the useful lives of the assets to be purchased. No legislation exists in the Cape Province governing this matter, but it is felt that the attention of the governing authorities might usefully be drawn to the importance of this principle in the case, particularly of the various types of asset comprising the installation of new or the extension of existing electrical plant and equipment. Particulars of the periods for which undertakings in Great Britain are permitted by the Electricity Commissioners to raise loans for individual types of plant and equipment have already been presented to our Association† and it is suggested that these be submitted to the authorities concerned for their information and guidance when giving consideration to requests for the raising of loans for electricity works.

*Vide "Standard Electricity Accounts," by H. B. George. Published by Juta and Co., Ltd. January, 1932.

†Vide Appendix II to paper by Mr. Councillor J. D. Low on "Depreciation in Relation to Electricity Undertakings," published in Proceedings of the 11th A.M.E.U. Convention, 1933. Page 182.

**Mr. Powell:** This matter has received previous attention.

In 1927 the Electricity Supply Commission convened a meeting at Johannesburg of representatives of the several Provincial Governments and the result of the deliberations was to recommend to the Administrations of the Cape, Transvaal, Orange Free State, Natal and South-West Africa the adoption of a proposed standard form of accounts (see "Standard Electricity Accounts," by H. B. George, published by Juta and Co., Ltd.).

We understand that the above is now incorporated with certain modifications in the standardised form of accounts recommended by the Institute of Municipal Treasurers and Accountants.

**Mr. Bradley:** I have to report: The accounting is, more or less, completed in accordance with the standardisation of abstract of accounts of local authorities as prepared by the Institute of Municipal Treasurers and Accountants, South Africa, in September, 1938, or as recommended by the Cape Provincial Administration in December, 1929.

Most undertakings contribute to the relief of rates — arbitrary amounts; similarly, all the undertakings have a renewals fund (sometimes called "obsolescence, depreciation or betterment fund") with no stated amount of contribution from revenue. Expenditure on capital account is not made from revenue, but from loans. In

Port Elizabeth we have renewals, reserve and sinking funds; the first two have allocations arbitrarily made to them, while the sinking fund must have the necessary contribution made to it to cover the annual redemption and interest charges resulting from loans. It is considered desirable that legislation should be set up to make the operation of a renewal fund compulsory in all undertakings.

**Mr. Wright:** It is felt that, before matters become too complicated, the A.M.E.U. could give some guidance in the keeping of costs and other key statistical data which would make direct comparison possible between various undertakings. At present returns are made to the S.A. Municipal Year Book, Industrial Census, Garcke's Manual, etc., and often information is not available because it is not recorded, while at other times it is recorded on a non-uniform basis, e.g., KW peak demand may be instantaneous, mean 2 minute, ½ hour or hourly.

The Electricity Commissioners in Great Britain have pointed the way in their annual volume of "Engineering and Financial Statistics" which gave (until suspended at volume xv in 1939 for the duration of the war) most exhaustive financial and statistical material of great value to undertakings in appraising their progress relative to other comparative supply authorities. Additionally, the returns for the country as a whole are given.

No better recommendation can be made than to study these returns as a basis of the form of accounts and statistics to be kept by municipal undertakings. As this matter vitally affects the Electricity Control Board in this country it would be advisable to open preliminary negotiations with them, possibly with a view to ultimate incorporation of the returns at present rendered to the Municipal Year Book.

**Mr. Stevens:** The opinion in Natal is that while standard accounts might be desirable, the policy is rather one for the Institute of Municipal Treasurers and Accountants. It would be open for the Association to make representations to the Institute, but the fact that the different Provinces operate under their own ordinances may prevent complete standardisation of accounts.

**Mr. Eastman:** As possibly some misunderstanding may arise concerning the remarks of the last speaker, I think they must have been made under a misapprehension of what is meant by "accounts." The standard forms of accounts referred to in this discussion are those which have already been approved by the Provincial Administrations of the four Provinces. There is no complaint about those at all.

**Councillor Eden:** In regard to legislation in the Cape Province and in connection with the United Municipal Executive and the Institute of Municipal Treasurers and Accountants, I think something is being done in reference to such things as renewals and obsolescence funds.

**Mr. Eastman:** That is exactly what is contemplated here in this report. If guidance does not suit, then compulsion should be exercised in seeing that electricity undertakings' financial position is safeguarded against opportunist methods of finance which have been frequently

adopted throughout the Union of South Africa on account of the financial difficulties in which municipalities have found themselves. This is due partly to war conditions and partly to Government action in placing financial burdens on local authorities which it is considered the Government itself ought to bear. I do not say that this is altogether the fault of the municipalities, but the easiest and the natural way of avoiding their financial difficulties is to take money from a trading department and what we are interested in ourselves is in seeing that the amount of money so taken is not to the financial detriment of the undertaking. As far as I know, nobody has proposed at any Convention of this Association that there should be no relief of rates at all.

**Councillor Eden:** As far as we are concerned, the position is that the funds are accumulating as in the past. I may say that in one year alone they took £67,000 out of renewals and betterment, and at another time £25,000. Personally, I hold the view that once money is in the renewals and betterment fund it cannot be taken out without some involved process. In other words it cannot be done by a simple resolution of two-thirds of the Council. If we could evolve some proposition through the U.M.E. I think it would be a good thing. A fixed percentage of reserves in relation to capital invested should be set, which cannot be taken out without some involved process.

**The President:** This is another matter which the Joint National Power Board would have settled. In Salisbury the policy noted by Mr. Eastman is not adopted; that is, of linking the redemption period of your loans with your assets. We follow the system of consolidated loans as adopted and approved by the Ministry of Health in Great Britain and if you would like further information we can supply it.

**Councillor Eden:** It would be helpful to have the support of the U.M.E. I move that this matter be referred to the Joint Power Board.

Agreed.

The Convention adjourned until 9.45 a.m. on Saturday, 19th May, 1945.

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## SATURDAY, 19th MAY, 1945

**The Convention resumed at 9.45 a.m.**

### GREETINGS

The President announced that a telegram had been received from the chairman of Cable and Wireless, Ltd., conveying good wishes for the Convention and that he had arranged with Mr. Groom, the local manager, to despatch a cablegram in suitable terms in reply.

**Report No. 12** (continued overleaf)

**1.25.—Standardisation of Tariffs and Charges for Supply of Electricity.**

**Mr. Eastman:** Before going on to Item 1.25 and the report of the Cape Western Districts Committee, I want to refer for a moment to the title of Item 1.24, "Forms of Accounts and Financial Policy," and to explain that the words "financial policy" do not appear in the titles of our agenda out of which this report arises. They were put in merely as a heading in this case because the question of financial policy did arise out of the comments made by those who were invited to offer their opinions generally on the standard forms of accounts. It was felt that because the form of accounts merely set out the form in which the accounts are to be kept but without any indication of the method of determining the figures to be put into the accounts under the headings of "renewals and obsolescence funds" and "reserve and betterment funds," it was decided to draw attention to that omission, and so the title and the words "financial policy" were added under that heading.

A wide diversity of opinion exists on the question of the standardisation of forms of tariffs for the supply of electricity. In general it is held that there is no need for such standardisation and that each undertaking should decide for itself the form or forms of tariff according to the circumstances prevailing in its area of supply.

Thus, whilst a two-part tariff with a monthly (service) charge per room plus a charge per unit supplied is favoured by two consumers (with a modification basing the service charge on floor or superficial area where a room cannot readily be defined and for supplies to hotels and similar establishments) others dislike any such method of charge and prefer a method — regardless of the monthly consumption — based on kVA demand or ampere demand (at declared voltage) plus a charge per unit.

It is, however, generally agreed that for large supplies a measured "demand" charge plus a unit charge is satisfactory and that for smaller supplies scale or "block interval" rate is appropriate to business and small power consumers.

All are agreed that "off-peak" or "restricted hour" rates at a low rate conforming closely to the cost of the generation of electricity during off-peak periods should be instituted in electricity undertakings.

General agreement is expressed also with the view that for supplies to consumers in areas outside the boundaries of the municipality the tariff of charges should be those in force to consumers within the municipality with the addition of a surcharge calculated as a percentage on the tariff rate.

In the Cape Province it has been ruled that a tariff of charges which for the purpose of inducing consumers to pay their accounts promptly provides for an increase in the charge to be made if the account is not paid within a specified period is out of order. Accordingly, the prevailing practice is to quote "gross" and "nett" charges for supply, the "nett" figure being applicable only if the account is discharged within due date. The difference between the "gross" and "nett" charges is in general of the order of 10 per cent.

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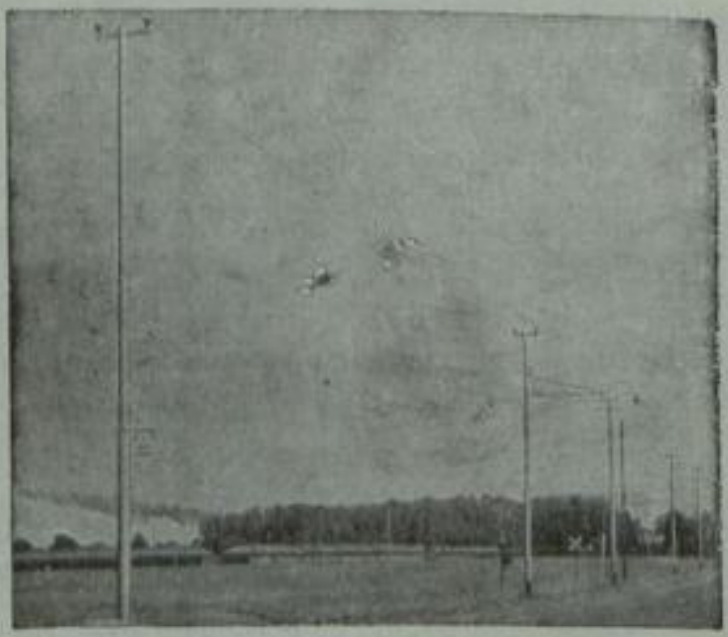

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A considerable variation exists in the relations between the undertakings and prospective consumers on the question of making service connections.

Some undertakings call upon the consumers to pay the whole cost of the service connections at actual cost, others provide the first 20 or 25 yards free of charge and the remainder at cost plus a percentage ranging from 5 to 25, or, as alternative to paying cash for the cost of the additional work, the consumer is required to guarantee an annual revenue for a specified period by consumption of electricity equal to 20 per cent. of the additional cost.

Doubtless the various methods of dealing with this question have been found to give satisfaction in the various undertakings where they have been inaugurated, and from the replies received it is clear that no degree of uniformity in these matters can be adopted until each undertaking has had an opportunity of closely studying the methods in use elsewhere and of deciding whether or not a change in its own method could be made with advantage.

**Mr. Powell:** In our consideration unification of tariff forms is desirable in order to make for simplification from the consumers' point of view.

It is considered that a reduction in the number of tariff forms offered should be made, and that the standard forms of tariffs adopted should be simple in order to be understandable by all classes of consumers.

In all cases it is urged that sufficient appreciation of the effects of diversity should be taken with a view to reducing irritating service or standing charges to a minimum.

**We recommend** that the A.M.E.U. take steps to obtain a census of the forms of electricity tariff now in use in the various undertakings of South Africa with a view to classifying and submitting to the members of the Association for their recommendations as to a standard form of tariff for different classes of supply.

**Mr. Bradley:** Three of the members in this area favour the uniform method of charge for service connections, all the others are of the opinion that the present charges enforced by the different municipalities are equitable, being designed to meet all the local conditions respectively, and it is assumed that they are such that the initial costs of the service connection are suitably covered; due to the varying local conditions it would be difficult to enforce uniform tariffs. Domestic tariffs are almost exclusively designed to provide the necessary minimum monthly income by the application of the minimum clause in either the total value — "land and buildings" and "room-basis" tariffs — the tariff selected depending upon the manner or mode of rates and taxes adopted by the municipality concerned. With blocks of flats, each flat to be separately metered, and the tariff applied as would be the case were the flat an ordinary house. An "off-peak" tariff would be advantageous — for, say, water heating — to remove load during the peak period. Rural supplies to be equitable should be charged some 10 per cent. more than urban supplies. Prompt payment of accounts would be

encouraged by a 5 per cent. discount on bills paid within fourteen days of being rendered. All service connections should be made to the meter at cost price plus 15 to 20 per cent. Extensions of mains should be made subject to a guaranteed annual return, payable monthly, the cost of the extension being recoverable over a four year period. Most members agree it would not be feasible to standardise any tariffs.

**Mr. Wright:** I have to report: In view of the termendous amount of work arising under the head it is suggested that, as a preliminary, a survey be made of the various types of tariff existing in this country in order to assess the extent of the problem. It goes without saying that the multiplicity of tariffs which will be found are largely a product of trial and error methods and that some classes of consumer will be found to be carrying the losses of others. The present time, which is at the threshold of an era of considerable development, seems favourable for an attempt to lay down a set of properly reasoned basic principles whereon to base a limited range of equitable tariffs if the applications of electricity are to enjoy free development on a national scale not inordinately penalising one class and favouring another.

It is agreed that this question cannot aim at equality of charge on each scale but it is possible to lay down similar scientifically based scales and also the methods of metering. Ultimately this ties in with methods of charging and accounting.

**Mr. Stevens:** Natal members differ from one another on this point. (a) One does not favour unification of charges, as so much depends on local conditions; (b) while admitting the advantage, this member thinks the matter should stand over and considers that the application of charges would be revolutionised before long; (c) one favours uniformity on the basis of the more universal scales, but realises that in special scales, such as o.h. peak water-heating and so on, local authorities should have a free hand.

**The President:** Generally speaking, I think we in Rhodesia are in agreement with most of the reports put forward. If there are no comments, Mr. Eastman agrees that this is a domestic matter which, until we have a report from all centres, there is no need to take further action than to refer it to the committee of the Association.

Agreed.

**1.26.—Regulation of Profits and Relief of Rates.**

**Mr. Eastman:** The greatest importance is placed upon the need for municipalities to decide upon the amount to be contributed to the relief of rates only after all of the financial safeguards mentioned under item 1.24 above have been adequately provided for. The present-day system of many municipalities is to decide broadly upon the amount to be so contributed and to allocate the remainder, if there be any remainder, to one or other of such of the funds described above as may exist. It is not unusual to find that in some instances no provision is made for safeguarding reserve,

betterment, obsolescence, renewals or depreciation or even to pay direct from revenue for works of a capital nature, but instead to allocate the whole gross surplus to the relief of rates after the deduction from the total revenue only of interest and redemption on loans.

Only two municipalities in the area covered by this report do not contribute towards the relief of rates.

In this connection attention is drawn to the fact that the Union of South Africa Electricity Act has embodied in it the principle that supplies of electricity shall be made available to consumers at the lowest possible price and that the price charged should exceed the cost of rendering that service by a small amount, if at all. The Act, however, does not in itself control the conduct of municipally-owned electricity undertakings in this matter, though it would appear that it may do so by regulations promulgated under Section 53 thereof, whereunder the Governor-General may make regulations, inter alia,

"prescribing the duties and obligations of authorised undertakers . . . . and generally for the better carrying out of the objects and purposes of this Act" . . .

Particulars of the practice in vogue in Great Britain as prescribed under the Electricity (Supply) Act 1926 are contained in the proceedings of the 1937 Convention of our Association as follows:

"The undertaking shall apply the net surplus remaining in any year and the annual proceeds of the reserve funds when amounting to the prescribed limit:

(a) in reduction of the charges for electricity; or

(b) in reduction of the capital monies borrowed for electricity purposes; or

(c) with the consent of the Electricity Commissioners in payment of expenses chargeable to capital; or

(d) in aid of the local rates;

Provided that:

(i) the amount which may be applied in aid of the local rate in any year shall not exceed 1½ per cent. of the outstanding debt of the undertaking; and

(ii) after the 31st day of March, 1930, no sum shall be paid in aid of the local rates unless the reserve fund amounts to more than 1/20th of the aggregate capital expenditure on the undertaking."

These provisions were incorporated in that Act to check the financial expedients in operation when the Act was passed similar to those of some municipalities in South Africa at the present time.

In this connection attention is drawn also to a clause in a draft Ordinance relating to this subject published in the Cape Provincial Gazette on the 19th May, 1936, and set out in the proceedings of the 1937 Convention of our Association reading:

(1) The Council of a municipality operating an electricity undertaking may apply a portion of the net surplus revenue thereof

in any financial year as a contribution in aid of the general landlord's rates.

(2) No such contribution in aid in terms of sub-section (1) shall be made unless:

(a) the renewals and obsolescence and the reserve and betterment fund of the undertaking together amount to more than 1/20th of the total capital expenditure of the undertaking as appearing in the balance sheet thereof as at the close of the preceding calendar year; and

(b) it is supported by a resolution of the Council passed by a majority of the total number of members of the whole Council.

(3) The amount of any contribution in aid made in terms of this section shall be clearly and prominently set forth in the annual accounts of the undertaking laid before the Council and in the certified statements or abstract thereof available for inspection by ratepayers and other interested persons in terms of any law.

(4) Where in the opinion of the Administrator the amount applied by any Council in terms of this section in any year is unwarranted or excessive, such Council shall be advised thereof, and the Administrator may direct that for a specified period thereafter no further contribution in aid shall be made without his prior approval in writing. Such approval may be given conditionally or unconditionally, and shall be in addition to the requirements of sub-sections (2) and (3).

Consideration of this section of the Ordinance was postponed upon representations made on behalf of the City of Cape Town.

Although, as stated above, provision appears to exist in the Electricity Act for the promulgation by the Governor-General of regulations of this nature, it is recognised that this may be held to be a financial matter akin to regulations relating to the establishment and maintenance of renewals, betterment, etc., funds and that, therefore, it is a matter for consultation with each Provincial Administration. It is felt, however, that the matter is so important that in whatever way the matter should be dealt with the procedure to be adopted should be that it will bring about the enforcement of regulations on these questions as soon as possible.

In this connection it is recalled that at the 1944 Convention it was resolved to ask the Government to establish a "Joint National Electric Power Board" whose functions would include the making of recommendations for the introduction of legislation on matters of this kind under the Electricity Act. It is suggested that the Government be pressed to inaugurate this body soon and, alternatively, if undue delay ensue in doing so, the matter be submitted to the Provincial Administrations in the form of a resolution of this Association.

**Mr. Powell:** We consider that in certain circumstances a limited contribution to relief of rates is justifiable.

We are, however, unanimously opposed to the large amounts being

appropriated as contribution to the general rate fund by many of the larger municipalities. In the case of Bloemfontein the appropriation represents 25 per cent. of the gross revenue.

We are familiar with the pros and cons as expressed at previous conferences of the A.M.E.U. and by the Councillors of our respective undertakings, but consider that in most cases the "cons" are more nominal than real.

**We recommend** that A.M.E.U. take steps to recommend to the Government that the appropriation of surplus funds from the electricity fund be limited to a reasonable percentage of the capital outlay. The figure suggested by the sub-committee is 1 per cent., this being the maximum amount which may be appropriated in the case of the waterworks fund in terms of the O.F.S. Local Government Ordinance.

**Mr. Bradley:** All members are in agreement that electricity supply should be available at minimum cost and, subject to a first contribution of some 10 to 25 per cent. of the total capital expenditure being paid into a reserve or renewals fund, contributions, if any, to the relief of rates should not exceed 1½ per cent. of the annual revenue.

**Mr. Wright:** I have to report: This material is rather too explosive for municipal electrical engineers to handle at present. As in Great Britain, where profit contributions in relief of rates are limited to below 6 per cent. of the gross income, it is felt that any limitations should be legislated for by higher authorities outside municipal circles. It might, for instance, be an item which could be included for when dealing with the standard form of accounts which, presumably, would provide for depreciation, renewals, sinking and reserve funds in appropriation of the major portion of present-day surpluses.

**Mr. Stevens:** Natal members are of opinion that the general policy of payments in relief of rates is inevitable. It is felt, however, that the extent should be regulated and that it should not amount to an unregulated appropriation of the greater part, if not all, of the surplus. In short, that it should be controlled.

**Councillor Eden:** I think it is generally accepted that a contribution should be made from power and lighting undertakings to general funds. I feel, however, that this Convention can achieve something in securing a reduction of the amounts which municipalities take from these undertakings, and I venture to offer a few suggestions to accomplish that object. The whole thing, of course, is bound up with the problem of the financial relations of local authorities with the central government and I merely want to give you the point of view of the Town Council as against the view of those purely interested in the production and sale of current.

The situation, briefly, is that municipalities over a period of years are finding themselves faced with expenditure which they do not consider should be rightly their responsibility. That has culminated in the report recently framed by the Institute of Municipal Treasurers and Acountants, which was submitted last month to Mr. Hofmeyr,

Minister of Finance. I do not know to what extent electrical undertakings have been consulted as a convention or association, but I suggest that stage one is that contact should be made with Mr. I. Q. Holmes, City Treasurer of Johannesburg, Mr. Green of Durban, and Mr. Walker of Cape Town, because those three gentlemen were largely responsible for framing that report. As I say, a meeting was held with Mr. Hofmeyr last month, attended by the Administrators of the four Provinces with the Executive Councils and Provincial Secretaries, and another meeting is to be held in Pretoria in August next. As a result of this I feel, Mr. President, that the financial structure of municipalities is going to be subjected to a complete overhaul in the not too distant future.

Let me say that my remarks are based on my knowledge of the Cape Province in particular, and not of the other Provinces of the Union, and if any other Province should differ, then may I suggest if there is to be any levelling, it should be on a levelling up basis and not levelling down. My municipality found itself faced with this business of taking large sums of money from the electricity undertaking. In the Cape Province the general rate is limited to 6d. in the £ and, consequently, your funds are circumscribed. For one thing you are faced with hospital deficits, which in the Cape Province are very big, and the benefit of this service is largely taken by people who have no contribution to make in the municipal area, and that I suppose applies to other Provinces also. Then again, under the national housing scheme, municipalities are faced with a serious loss. Municipalities have been arguing about this question and the result of their representations will soon be known: for instance, as regards services, whether or not they are included in the loss.

These are some of the things they are faced with from time to time and the position is getting worse, so you will appreciate that when there is a source of revenue which the municipalities want so badly they will take what is required from the electricity undertaking. My own municipality was faced with that position in 1941, and it was my fortune to pass through the chairs of most of the committees, so we called a meeting of all the heads. We have now changed from the old method with one exception, and that is that the renewals, betterment, obsolescence and reserve funds are not fixed, as suggested yesterday, but that money can be taken from them by a simple resolution.

Now stage one is that they should be fixed by some statutory legislation. The position is now that instead of framing our estimates as is customary by saying, "This is what it will cost us to run and we will take all we can from light and water," we say, "Let us take these departments and separate them," and we did that with electricity as a commencement. It was decided that we had to find a sum in the neighbourhood of £30,000, because that was the contribution of light and water combined to our general fund. Some Councillors objected, and said, "The public will kick and we will see the result at the elections," and the usual stuff you get on such

occasions. So we decided to take the public into our confidence and tell them what we proposed to do. I may say the response was extraordinarily good. As regards the electricity undertaking, we decided that the estimated revenue for the coming year should be the basis under which the contribution should be made. I do not suggest, however, that the percentage we have decided on is correct —personally, I think it should be lower—but we decided that 10 per cent. of the estimated revenue for the coming year should be the basis, and the electrical engineer was instructed to estimate his revenue on the low side in order to be sure of getting a surplus. A fixed contribution was made to renewals and betterment, and the usual loan charges, sinking fund, etc. As regards the expenditure, it was estimated higher because we wanted to see in one year how it would go. By resolution we resolved that any surplus should automatically go to renewals and betterment, and the electricity undertaking then definitely knows what its position is — that we take 10 per cent. We extend that also to the water account. The same thing was done also in regard to the morning market. We used to take the lot, but we have now re-organised that. We take 50 per cent. of the market revenue. We take this from the three trading accounts. They make a fixed contribution and we then leave them to work out their own salvation.

The next thing was to consider where to get the money in order to make up what we have given away. Our contributions were fairly substantial, as I indicated before, and we found ourselves in a position where we had to find about £15,000 and there was only one way of doing it — that was to raise the rate. The general landlord's rate is already exceeded, so we put our heads together and resolved that we would make a quid pro quo by splitting the rate. We charged the general landlord's rate and against that we charged various items, such as public works, town clerk and treasurer. Then we were faced with public health, so we levied another rate—the health rate—and lumped them together. Now "native affairs" is a liability to most municipalities, so we regarded that as a matter for the health of the city, and we imposed the health rate. The attention of the public was then focussed on this matter and I was faced with adverse criticism from the public. Comparisons were made with other centres as to the amount of rates being paid, but our chairman of finance, in my absence, pointed out that our contribution from trading accounts was so much smaller than that of other municipalities and in that way the whole thing was levelled up.

That is briefly the story, and I am going to suggest that the correct method of approach from the electrical point of view would be that the Institute of Municipal Treasurers and Accountants and the United Municipal Executive should have some proposition put to them — that the budgets of municipalities should be examined, with particular reference to water, electricity, marketing and so on; to frame the budget on what they are permitted under the Ordinance, and to leave them to pay their way. Whatever is required above that will be some small percentage against water, light and other money-

making departments, such as native beer halls in some cases. We have tried both methods. This present method is working itself out, and I may say that articles have appeared about it in financial journals. I think it is of little use to ask the proposed Power Board to tackle this. I think municipalities themselves are now prepared to consider this question, because it is realised that the whole thing is getting out of hand and they must devise some method or some machinery to meet the situation. I think if this Convention were to take steps to make contact with the financial side of municipal undertakings, we would then get on to the road towards achieving some uniformity in relation to electricity undertakings. I suggest we do that, because we will then find the public taking an interest. They will say, "Do you mean to tell me that is what it costs to run the location?" Yes, £10,000 a year." "Who pays?" "That is what is included in the health rate." "What does it cost for public health?" And so on. And you reply, "If you want all these health visitors, doctors, nurses, and so on, that is necessary." That is the frame of mind of the public. Attention is now being focussed on the reason for the impasse which has occurred in relation to the central government. And so, too, with the housing business: municipalities are faced with big losses. We cannot go on for ever like this. Sooner or later a halt must be called to this compounding. If this Convention will take steps on the lines I indicate I think it will do good. As I say, we will have an opportunity in August next when the U.M.E. will meet Mr. Hofmeyr and the whole financial structure will then be discussed. I think they will then achieve some measure of progress in dealing with the Minister. Our Executive met in Cape Town some six or seven weeks ago and they are determined to achieve some result.

**The President:** You will realise from Councillor Eden's remarks that more or less he is indicating that we shou'd not refer this matter to the Joint National Power Board, but we should take steps ourselves as a domestic organisation. Would Councillor Eden prepare something for submission to the meeting?

**Councillor Eden:** Yes, Mr. President.

**Councillor Beckett:** Financially speaking, matters that concern Johannesburg are unfortunately so collosal that I am certain no true parallel could be drawn with any other municipality, except possibly Cape Town, and the latter city is, of course, better placed financially in that I believe it is allowed to take quite a big amount of money from its power undertaking, which Johannesburg is not. But there is so much that is helpful in the line of approach taken by our friend from Kimberley that I want to compliment him and offer to him my congratulations on giving us such a very helpful contribution. We in Johannesburg are particularly perturbed at the moment by various things. Just to give you an instance: new demands have been put forward by our mechanics — demands which are going to entail expenditure of over a million and a quarter per annum. And that only deals with one phase of our work, so that

I am afraid it would be impossible for us to ask anyone other than our own advisers to put forward any set of conditions that we could conform to. I fear, therefore, that we are a separate entity and will have to demand that we be allowed to control our own destinies in this matter because of the vastness of our commitments.

**Councillor Ferry:** I would like to hear the views of one or two of the engineers here present this morning. Because I feel that as far as Cape Town is concerned it is in a large measure due to the very efficient staff of the electrical department under Mr. Eastman and the power station superintendent, Mr. Jagger, that we in Cape Town have been able to make these profits out of electricity, and to effect such a saving. As I said yesterday, my opinion is that the financial future of electricity undertakings has not been handled properly. Apart from contributing approximately £1,000,000 of profits from the electricity to the relief of rates in the last five years, I think an amount of £57,000 was put on one side in the form of depreciation and that was also taken last year. I must say that I was particularly astounded when the chairman of the Finance Committee made these high demands on the Electricity Committe, because I understand this was money which could be spent with advantage on our electricity undertaking at the time had the necessary manpower and materials been available. But that was not available and consequently the money was put aside. When this came to the notice of the Finance Committee it did not take them very long to transfer it to their account.

I think the Electricity Act of 1922 distinctly says that deficits should be borne by and profits should accrue to the consumer. In the event of a deficit naturally the tariff would go up; therefore in the event of a surplus it should go back, in my opinion, in the form of reduced tariffs. Knowing the public bodies as I do, if a municipal undertaking in any town was run at a loss and they had to reduce expenditure, I am afraid the first thing they would tackle would be the earning power of the men concerned. That being so, then, when an undertaking shews a profit, why should not a portion of the profit go to the people who earned it? That is what one would do in a really well managed business, and that is what I endeavour to do myself.

**Dr. de Wet** (Stellenbosch): Mr. President,—We have heard the voice of the big municipalities. I would just like to say a word about one of the smaller ones. We at Stellenbosch are in a somewhat unique position in that about 45 per cent. of our property pays no rates. So where is our revenue to come from? All university buildings and hostels pay no rates, so that the man in the street must face the burden of very high rates, or we must take some of the profits made on the electricity undertakings. Now the university and its hostels must pay for services and, consequently, we try to get a little back from them in the form of services. The ordinary man in the street is quite content with the charges. They are comparatively low. For a small cottage the minimum is

about 4s. 6d. a month for six units and after that 1d. per unit. So that we take, roughly, £6,000 a year from our electricity undertaking. Please, therefore, do not tie the hands of the smaller municipalities by stipulating that only a certain percentage of your profits shall be used for reduction of rates.

**The President:** I should like to commend to engineers a study of Drummond and Marshall on "Consolidated Loan Funds." There I think you will find one of the solutions to the problem which is worrying all of us — that Councils are not making regular and proper financial provision. In other words, we are worried that the amount taken for the relief of rates is taken before proper provision has been made. If a consolidated loan fund had been in operation in your various towns you would have had some of your problems eased immediately, because the correct financial provision must then be made, which covers all the amounts which you at present put into the renewals and obsolescence fund, and so on. I think many of you at present merely pay redemption charges, which may or may not equal the weighted amount of the assets represented by that particular loan.

**Councillor Eden:** I should just like to say this to my friend from Stellenbosch: That it is not unusual to make provision in regard to exemptions. That is one of the thorny problems we have to face and the Municipal Executive have tackled the Government along this line. Whether they will be successful or not I do not know. It is certainly a very wide field they have to cover. I am preparing a resolution which I will hand to Mr. Eastman in a few minutes. This deals with the crux of the matter and I might add that the co-operation of the Institute of Municipal Treasurers and Accountants might be sought with advantage in devising ways and means.

# Cost of Proceedings

**The President:** We will return to this matter after the tea interval.

May I take this opportunity to say that the proceedings of the Convention have been costing the Association more than we have received from the sale of them and it is possible that the cost may go up 30 per cent. We may call upon our friends who advertise to pay more, but in addition to that we would like all members to purchase as many copies of the proceedings as possble on behalf of Councils. I think a copy should be in the library of every Council, as well as in the possession of every chairman of committee, if not of the whole committee, or indeed of every Councillor; and I commend this proposal to all Councillors present, that they take steps to authorise the purchase on behalf of their Councils of as many copies as possible to help the Association. It will be a practical contribution to the Association and it will avoid possibly a large increase in subscriptions.

Tea interval.

**On resuming:**

**A Member:** With reference to what you said before the tea interval, Mr. President, would one be in order in moving that the contributions from various municipalities be at least doubled.

**The President:** A proposition in this connection will be put to you in Bulawayo.

**Item 1.26** (continued).

**Mr. Eastman:** Mr. President and Gentlemen,—There is before us a resolution submitted by Councillor Eden, with an amendment which I think he desires to incorporate. This he has handed to me in writing, reading:

> "Before making a recommendation to the Joint National Power Board for the introduction of legislation to control the financial arrangements of municipalities in relation to their electricity undertakings steps be taken to make representations to the United Municipal Executive, and to urge that the whole structure of municipal budgets be examined with a view to charging the whole of the costs of spending departments to the general rate and to the health rate, with a fixed contribution thereto—the amount of which to be determined as a contribution from the electricity undertakings subject to adequate financial safeguards being introduced in the undertaking itself."

I think we are all very interested indeed to hear from the representative of the municipality personally an explanation of how that municipality has already endeavoured to meet the proposals which have been set out recently as being the views generally of those centres which I contacted. We must recognise that municipalities generally are in a difficult position because of the unfortunate circumstances that have arisen during the war and the financial relations between the municipalities and the Government because—in the view of the municipalities—of the Government shirking many of its responsibilities and placing them upon the municipalities. But I would suggest that the speaker who distinguished between the electricity supply and services has not given sufficient recognition to the fact that the supply of electricity itself is a service. It happens to be a service which is paid for through a convenient medium of measurement which we call a kilowatt hour, but essentially it is a service. All our deliberations on this subject have been founded on that idea. It is not an idea which we have developed ourselves—it is one which has gradually come into recognition throughout the world in all places where electricity is supplied on a large scale.

With reference to the phrase in the resolution reading, "Before making a recommendation to the Joint Power Board for the introduction of this legislation, we should try to obtain the assistance of the Municipal Executive," it should be remembered that the Joint Power Board proposed by the Association has functions which enables it to act as an advisory body on this very subject, so that in any

case, if that Board were to be constituted, it would doubtless, in due course, give consideration to the question now before us whether we approached it or not. To that extent, therefore, the proposal before us is not quite as definite as otherwise it might be on the question being handled by the United Municipal Executive, as against it being handled by the Joint Power Board. If the Executive did not agree with our views, and the Power Board is not constituted, we would, of course, fall by the wayside as we have done before. It is because of the fear of doing so that at our last Convention we thought that a body of that kind would be the proper one to obtain effective results in those directions which we consider are necessary in the interests of electricity supply. On the other hand, I believe that our suggestions will be welcomed by those municipalities who realise the difficulty into which a continuation of their present policy may land them with their electricity undertakings.

In the questionnaire which was sent to our members in the Cape Western District the specific question was asked: "Do you, or does your Treasurer, agree that statutory provision be made and guidance be set up by statute to assist municipalities in the framing of financial policy and in particular in regard to the establishment and maintenance at proper figures of the renewals and obsolescence fund, and so on," and it is to be presumed that all the replies have been written in consultation with the City Treasurers. I am in a position to say that so far as Cape Town is concerned the City Treasurer does agree with the statements that I have read out from this document, both in regard to rules for the relief of rates in general principle, and for the determination and regulation of the amounts to be placed to renewals, obsolescence, etc., funds. Now if all City Treasurers are of the same mind throughout the country we may expect a measure of sympathetic consideration to our views, but if many City Treasurers are not able to influence their Councils in the direction of their views, then of course we are no further forward.

It might serve a useful purpose to put forward a recommendation on these lines, but I do wish to draw the attention of our meeting to the fact that the proposed terms of reference of the Joint Power Board in any case enable it to deal with the matter itself of its own accord.

**The President:** Gentlemen,—You have now before you the resolution proposed by Councillor Eden. Is it agreed?

Agreed.

**Item 1.27.**

## GENERAL

**Mr. Eastman:** A number of minor items were referred to in the replies which we received from members in the area which I consulted. Most of them were domestic matters, but there is one which I thought might be referred to the Convention, namely, the desirability of bringing about uniformity in the requirements of various Gov-

ernment bodies to whom returns have to be rendered relating to the segregation of units sold in the various categories.

Attention is drawn to the desirability of bringing about uniformity in the requirements of the various Government bodies to whom returns have to be rendered relating to the segregation of units sold into various categories. It is also thought to be desirable that clear-cut definitions be made for the guidance of undertakings in respect of the various headings so that there can be no misunderstanding as to what should or should not be included in them.

That relates mainly to the standard forms of accounts in which we have various headings, such as "electricity sold for lighting, for power, for industrial purposes," and what not. Apparently there is some confusion in certain quarters on these matters and perhaps a lead might be given in discussion in the Executive Meeting to see if something can be compiled which does away with these difficulties.

**The President:** Is it agreed that this matter be referred to the Executive for action?

**Mr. Gripper:** I second that. The same subject was raised at the last Convention stressing the fact that it seems more useful to segregate the class of consumer rather than the use to which he puts the current. In the Union the Census Department, the Labour Department, the Accounts Department, and so on, all want to know how many units go to power and how many to light, whereas we are more concerned with the class of consumer. Whether they use it for light or power is rather less material.

**Mr. Stevens:** For a long time I have thought desirable a standard form of statistics which would enable a ready comparison to be made in the working of various undertakings, and at the same time supply all information necessary for the Municipal Year Book and for the Union industrial census. Explanatory notes should be included to ensure that specific information only is entered on the statistics form. The present returns compiled by our Association are very valuable, only there are figures in them which could have more than one meaning. For example, "miles of mains" could be miles of single wire or cables, or, as I presume is intended, route miles, and the number of consumers whether one taking current for lighting and power separately metered should be counted as two or one as I would expect.

Further, having read and heard Mr. Clinton's interesting paper entitled "The development of the Salisbury municipal electricity undertaking," and also having read Mr. Sibson's able description of of the Bulawayo undertaking, I am particularly interested in the organisation of the staff engaged on their respective schemes, and would like, in future, to see included with the statistics prepared by our Association each year details of the staff employed by the various undertakings and the organisation. For example, the number of engineers, superintendents, inspectors, etc.

In regard to the Natal area report under the heading 1.27 it is suggested that arrangements be made whereby selected members of the staff of one undertaking might be granted additional leave which they could spend in another undertaking.

**Mr. Wright:** In so far as the Transvaal area is concerned there would appear to be very little immediate financial gain to be derived from some of the foregoing proposals which constitute long-term objectives. Accordingly there may be some disposition to ask, "Why bother?"

In our view the whole question is bound up in whether the individual engineers of municipal electricity undertakings are prepared to present a united front in working to the achievement of goals which are to general and mutual benefit, or whether they prefer to be left alone in their parochial functions. It would seem that factually each engineer holds the former alternative in trust. Unless the whole municipal electricity supply industry is to avoid slowly crumbling into a state of control by semi-governmental authority it must in the future illustrate, through this Association, good and sufficient reason for its voice being given equal representation on some form of co-operative board. The effort was initiated at the 1944 Convention to establish a Joint National Electric Power Board, representative of all interests in the supply industry and it is felt that through such a board it will be both necessary and practicable to undertake with good effect the foregoing items of co-ordination and standardisation.

If successful, such effort will usher in an era of thorough, willing co-operation in a democratically constituted industry with really healthy reflection on electrical development in the Union and Rhodesia.

**The President:** You have now before you the resolution which has been proposed and seconded. Do you agree that it be referred to the Executive Council for action?

Agreed.

# Discussion on President's Paper

**The President:** The remaining item on our Agenda is the discussion on the Paper which I presented earlier in the Convention. I should like to assure you that I have no intention of trying to escape replying to this debate or discussion, but as several members have indicated that they propose to send in written contributions I suggest that my replies be accepted as a written contribution.

In the meantime I will run over some of the points that have been raised. Some of them I think have been settled privately with the various speakers. Let me say at once that I appreciate very much the interest which you have taken in the Paper, because it enables me to learn quite a lot and gives me a fresh outlook.

First, Mr. Eastman raised the question of tobacco curing. As mentioned before, we have a report in course of preparation and I shall be pleased to give any member any information in that regard if he makes special application to me. The report is too long, however, to give you a resumé at this stage.

In regard to the Works Council, several speakers have asked for further details. The success of the committee's work depends to a large extent on the personnel of your committee, particularly of the chairman. There is a natural tendency on the part of the average foreman or engineer to resent any criticism from the members of the works council who are under him, and you will, at the start, get your share of abuses. The foreman or engineer does not necessarily like everybody under him to the same extent, and he has not the same opinion of one man as he has of another. The staff often have constructive views to put forward, and there is sometimes a tendency for those views to be resented. This reaction can only be controlled by the leadership which your chairman or engineer demonstrates. Generally speaking the whole thing must be worked towards its ultimate aim very slowly. There is no question in regard to its value or usefulness in leading towards a satisfactory and efficient department. I think you have already met a number of members of my staff and have been able to form your own opinion in regard to their willingness to work together as a team.

Mr. Gripper brought up the question of difficulties which might be met with in the case of fusing of a single phase on the high tension side of the transformer, using the protection we have adopted, and the possibility of burning out the consumers' appliances. In reply to Mr. Gripper's first point, there are single phase fuses, and the possibility naturally always exists of damage to the consumers' appliances. We do, as far as possible, recommend through the local wiring contractors that every consumer puts in single phase protective devices wherever possible, but I can assure you that the danger is not such a great one despite the fairly extensive rural reticulation. Those occasions where a farmer has a motor running and the fuse simultaneously blows out on the high tension side can, to a large extent, be avoided by protection on the consumer's installation. During the lightning seasons, we do occasionally get fuses going in but they do not give us a lot of trouble. As I say, the probabilities of damage from this cause are not very great.

The next point was the question—is it intended with the 35 kv. main network to have only one 33,000 to 11,000 volt step-down point? The step-down, I think, will be ultimately 33,000 to 11,000 v. Obviously, until we reach full coverage it is necessary to adopt expedients, and you will have seen in the course of your travels that we have a number of 33 kv. to 380 v. step-down sub-stations; ultimately we hope they will disappear.

Now, in regard to the ability of concrete poles to sustain shock, we have had, as far as we know, only one case where a vehicle hit one of these poles with some force, and I think Mr. Gripper has satisfied himself in regard to its ability to sustain a reasonable shock. In most of our service lanes, where we have low tension concrete pole lines, all the rubbish removal services and so on have to travel down those lanes, many of which are not covered with tarmac, so in the wet weather I have no doubt that vehicles do occasionally strike against the poles. We have not made a very careful examination of every pole for obvious reasons, such as lack of staff, but since the poles have not come down we presume that everything is fairly satisfactory.

In regard to the spacing of telephone lines from some of our high tension mains, you have already heard Mr. Harpham's views and also those of Mr. Southwick. The regulations are not so severe in Rhodesia as they are in the Union and we have dealt with most cases on the basis of co-operation. We submit our proposals to Mr. Harpham, the Postmaster General, and so far I must say we have not been handicapped by any restrictive legislation on the part of the Department of Posts and Telegraphs.

Mr. Gripper raised another point—can the work of maintenance cards be dealt with by women clerks? I think the answer is "Yes." We have one or two very excellent girls on our staff. Some of them are, as a matter of fact, almost engineers, and certainly as regards costing and this type of work they fit in very well. The main sheets, of course, are scrutinised by the engineers, but I have no doubt that these girls in the post-war period can continue to do the work. I feel that our problem in the post-war period will be not to find employment for certain people, but we shall have to follow the example of Russia and make use of women as far as possible because of the demand.

In regard to cost per kilowatt installed. I think that was in connection with the power station—the new one. I think the ultimate cost will be about £32 per kilowatt for the first extension installed. But here I would like to sound a note of warning—we must get our statistics on to a common basis. You may make a comparison between the Klip Power Station and the Port Washington and you will find the Klip Station is cheaper, but the efficiency of one is much higher than the other. When you work it out on a common basis you will find the ultimate cost is the same. I think that particular point was dealt with in a paper which was read to the Institute of Electrical Engineers by Mr. J. Monks. When I got out the comparisons bringing them down to common factors, although Port Washington was efficient, in the end the cost of obtaining it was the same as by utilising the arrangement made at Klip.

Mr. Powell dealt with the question of our very large staff. All I can say as regards the members of my staff is that if they feel they are underworked I should like them to say so. Do not forget that there is a very big area of supply in Salisbury.

In regard to the subject of accounts for rural development, I may say we have been preparing for a long time an Assets Register in which the cost of every item appears. If it is Sub-station 304 at Wynne Street, or a rural sub-station, full particulars appear in the register. Every item appears to shew whether it is a rural sub-station or anything else. It is set out on a card with its economic life and the period assessed will be checked every five years. If there is any special change as regards the equipment in the sub-station the figures are adjusted, and that determines the amount which you pay to your Depreciation Account under the Consolidated Loans Fund method of finance. This then enables you to decide just what your rural reticulation costs by way of capital charges and so on, will be. As regards the revenue, as you know from my paper there is a table which gives you what revenue we get from the rural areas and also what we get from the Township which falls under the control of the City Council, so you

are able from that to get any figures you like. Capital charges for our rural reticulation are not shown there, however. The account is not specially split up but it can be arrived at any time if so desired. There are, of course, certain things like switchgear which cover both rural and town areas, so we cannot split it up except in an arbitrary fashion.

Mr. Powell made another point—that the State should do everything outside the town, but there I entirely disagree with him. I feel that if you have studied the McGowan Report on distribution, especially in Great Britain, you will see how much at variance the recommendations of that Report are with the view put forward by Mr. Powell. My own view is that if you have a city or town anywhere its economic area can be defined. As far as the farmers round here are concerned, they contribute very largely to the welfare of Salisbury. The farmer exists because we exist, and vice versa, and you cannot define where his or our responsibility begins or ends, and I think from the point of view of economy in distribution within a limited radius (I do not think you can go hundreds of miles away) the responsibility for doing it rests chiefly with the local authority. If not prepared to do so, it should give up the whole of its distribution in the town as well, and hand the whole job over to the State. You cannot fix your boundary say one mile from the Post Office, and say "I do not want the unremunerative load outside of that." I might say I got out some figures for the Mining Commission, and in regard to Salisbury it would seem that on a surcharge of only five per cent on the units sold in the local authorities' area of supply we could justify the supply to the whole area, which would mean a reduction to rural consumers of 25 per cent. In other words, by putting the cost from .9 of a penny up to a penny within the town, on an average we could reduce the cost which outside, at present, is about 1.25 of a penny. Moreover, you have to regard the welfare of the whole community which suffers if you put on restrictive practices and also levies. You are, of course, entitled to a small levy but it must not lead to isolationism, which in the long run injures general welfare.

You will have seen in regard to wooden poles that we are not "sticky." We use any type. The only reason we have adopted the concrete type for the conditions in Salisbury is because an engineering analysis has led us to conclude that for this area concrete poles are the best solution—that is, having regard to the various essential factors.

Mr. Powell brought up a point in regard to steam accumulators. I think he mentioned it had no advantage over a standby boiler. Then he said the standby boiler could be used at peak periods. If so, it no longer becomes a standby boiler. The question again is one for individual decision. We have conditions peculiar to Salisbury. We had to have regard to increasing demand and the fact that present Power Station No. 1 would have a fairly short life. We naturally had a factor there which meant a particular advantage to any item which introduced low capital charges, and which might not apply to Station "B" for instance at some other town.

Mr. Ferry brought up the question of awards to staff, and I think the point was also mentioned by Mr. Eden. I have given that matter

a good deal of consideration. The Council has from time to time made grants or given bonuses to the staff for carrying out special duties, but generally I have not recommended it individually. Where you have a good team you cannot as a rule pick out the fellow who alone did the job. You can rarely do that. In fact, I defy you to say where he began and finished. In a big organisation every man pulls his weight, including the drawing offic staff, and each man is just as essential to the completion of the scheme as the fellow who started the thing or suggested the idea and did nothing else. I do suggest, therefore, that if we are going to show any return for meritorious services it should be to the whole organisation, so as to get all the men and women working as a team. I suggest you should, if you have not done so already, study *Wage Incentives*, by J. K. Louden. It deals with the ideas of such people as Innes and Bedaux.

I could go on for hours with various points, but I will deal with just one point that Mr. Eden brought up. How do you cover the different departments? I think he divided them into spending and non-spending departments. There again I think there can be a division. Can I illustrate it, for instance, with stores? Your stores costs can be divided into two groups—standing charges and running charges. Just as with electricy you have kw. demand and energy charges it is the same in the stores. Thus one can calculate the standing cost per £1,000 of output as well as the running costs per item, and decide year by year whether you are keeping above or below a particular predetermined figure. We do something like that in regard to analysing the costs of operating the Electricity Department.

Someone questioned me in regard to cost per unit of labour. Our natives cost us on the average £27 per annum per boy, but that tells you nothing about his output. If you wish to make a true comparison you must equate the spending power of one pound here and in the Union, to get down to the cost of your native labour per thousand pounds in the Union and in Rhodesia. That is also influenced, of course, by the capital equipment with which you have provided your boys. You then have a yardstick with which to determine whether efficiency is going up or down, and if you refer to the curves in my paper you will see there a steady decline. If there is a rise I should want to know why. You get no bonuses for rises. However, it is a big subject and I do not know that I can elaborate it any further: you can study the subject extensively in current literature.

Mr. Ferry also mentioned that our rate of increase in demand was great, and was possibly due to industrial concerns. At the moment unfortunately Bulawayo is taking them all! We hope that one day Bulawayo will disappear into the desert and then we will obtain some industries. (*Laughter*). We have a very large number of domestic consumers and we have a very high proportion of sales, or rather the ratio of units used per consumer per annum is much greater here than the average town. I think these are conditions peculiar to Salisbury. At the same time we have left nothing undone by way of propaganda in the past, and the compound interest law is now taking charge: our consumers now represent our real advertisements. Some of us try to sell energy before we are in a position to offer servicing.

Councillor Eden also mentioned another difficult problem which we have had to tackle—what we do with rural consumers who do not pay up. Well, most of them are so anxious to get current to-day that they will come along with their cheques, and during the war these cheques piled up. The City Treasurer begs us not to take them. We tell the consumers that we are unable to give them a supply immediately and until we can do so we won't charge them. Probably conditions are not as favourable everywhere else, so that you must use your own discretion. If the area is depressed you must be protected to a greater extent than here, where the farming community at the moment is flourishing. The tobacco industry at present is such that they can pay cash.

Mr. Wright brought up the question of the automatic earth leakage switch which we think should be insisted on in all rural areas. I do not know if you recall that this matter was dealt with by the Association. I think Mr. Eastman got out a report which was submitted to a previous convention—I think it was the Umtata Convention held in 1939—and I can do no better than refer you to that report for the views of the Association in regard to earth leakage relays on consumers' switches. I may add that we have had these in use for a long time, as long ago as when Mr. Metelerkamp was in Salisbury. He was here and installed several types—both British and German. At one time the only satisfactory ones were of German manufacture, but later on British manufacturers took it up. Most of our experience—unfortunately it is not as wide as I would like—goes contrary to some of the recommendations in the report. I think the report should be carefully studied, and the whole question could with advantage to the Association be examined in the light of later experience. The use of these relays does give you the possibility of reducing the cost of your installation: but the subject is one for a whole paper.

Mr. Wright brought up the question of staff, and I think a good staff does pay dividends. After all, my Council does not pay its engineers £1,000. I wish it did, because some of them are worth more. The Council gets far more than £1,000 worth from them, and of course the ratepayers score.

Councillor Beckett mentioned the need for the earlier submission of papers. I think we might take that *nem con*. We should try to get them out ealier because it would contribute so largely to the good that a conference can do. I am guilty myself, but there again war conditions must be blamed to some extent. Before the next convention, one who is to give a paper should be requested to prepare it not less than three months before, and that means starting almost immediately.

Mr. Trelease also brought up a question in regard to the basis on which I tried to arrive at the amount we had available to spend on distribution. The question is whether the revenue per consumer represents what I consider to be the saturation figure. In a sense it is so. It is the limiting amount, to my mind, which a consumer can afford to pay for electricity. Much of it will be indirect. For instance, the man who makes soap uses electricity, and a proportion of the cost of the soap represented by electricity comes into the general figure. The parallel is that wealth is equal to h.p. per head of popula-

tion. You will recall that that has been referred to quite generally in dealing with the output of various countries per capital, and I am using something like the same theory in this connection. I think it is a very rough guide. When you are building up your department you may get a steep rise, which you will have noticed if you refer to your statistics and those published in the paper, but thereafter it becomes a much more constant lower rate of increase. Just as you find the rate of wealth has been increasing through the centuries by about 1½ per cent per annum.

Then Mr. Trelease also mentioned the question of a pilot supply which might pay for itself before we obtained full coverage. I think I did, in a sense, indicate in the paper that that is what we are doing. Expedients of that type are used in order to obtain for the moment the lowest cost. Ultimately all these expedients will be merged into the larger idea.

Then again he questioned whether our transformer oil filtering period was not somewhat generous. I only wish I had had time to obtain from Mr. Cowen, the chairman of the Electricity Commission, the figures which he recently obtained on the question of transformer oil in service in the tropical conditions around Salisbury. I have taken the matter up personally with the transformer manufacturers themselves, and with their chief designers, and I think that insufficient attention has been paid to equipment designed for this country in regard to the effect of high temperatures. The Electricity Supply Commission, as a result of their investigation, have definitely amended their specifications in regard to transformers required for service in these territories. So I do feel in regard to Mr. Trelease's point that we should have regard for the peculiar circumstances or conditions which obtain here. That is why we have come to the conclusion that three years is not too long a period, but naturally, as he pointed out, we will find out ultimately by regular maintenance whether it is too generous or not sufficiently so.

Another question which the same speaker raised is, I think, being dealt with by the executive—that is a common basis for statistics. Gentlemen, that is essential. Otherwise we are making comparisons that mean nothing. They may be all right for engineers, but consumers want a ready means of making comparisons. Unless that is done officially by the Association I am afraid you will always have something on which consumers will look with suspicion.

Mr. Trelease mentioned apprenticeship training, and I think we are generally agreed about that. We are trying very hard to improve the efficiency of training of the apprentice. We feel it is our responsibility, and we want to do the job as well as we are able. We are now training a couple of jointers in the following way. They do all their initial training at the bench. As these are our future tradesmen and on them will depend the output per man, I think it is something that everyone should tackle with enthusiasm. Mr. Wilson in his comments suggested this committee which, as I have stated, the executive has put in hand already.

He also brought up the question of wood poles, and as I have already explained, we are not "sticky" in our ideas. We had some wood

poles from the Union, but they cost rather more than the figures Mr. Wilson obtains them for in Pretoria.

I think what I have said covers briefly and hurriedly most of the points raised. (*Applause*).

**Mr. Clinton:** It is interesting to learn from the comments submitted by Mr. Eastman that in the Cape rural area resistivity of the soil is such as to prevent the use of auto earth leakage switches. Tests taken at random in the Salisbury rural areas do not indicate the same high figures nor the wide variation between seasons. No doubt this is due to the different characteristics of the soils. Whilst the alternative adopted in Cape Town is in the circumstances there a necessary solution, it is, I think, in general preferable not to use the M.E.N. system.

Wherever possible I have stressed the fact that the use of concrete poles in the Salisbury area was an economic and technically correct solution, having in mind the conditions particular to the area. There are, of course, other centres where similar advantages would lie in favour of concrete construction. I cannot, however, agree that the cost of production, transport and handling is the result of the lower cost of unskilled labour available in Rhodesia. If the nett cost of native labour, and for that matter European labour, is compared per £1,000 of output, or on the basis of per £1,000 of material used, I do not feel there will be much difference in the centres compared. Moreover, where labour costs are relatively higher there must be a stage where the introduction of more capital equipment becomes justified. I have no doubt delegates will have noticed that the handling and transport costs are smaller than might have been anticipated. Experience in the erection and handling of poles has demonstrated that the additional weight does not cause costs to vary in direct proportion. Possibly when the concrete form of construction was first introduced this did obtain, but since the personnel have become accustomed to the use of concrete standards there has been a progressive drop in the costs of handling, erection and transport.

In regard to wireless communication system for service vehicles I agree it is again a question of deciding what is the system most suitable for a particular undertaking. I think the most interesting possibilities will lie in the development of the carrier system for many undertakings. When considering the system in use in Salisbury regard was had for the use of a private telephone system independent of the G.P.O. on the lines of that used by Cape Town. It was, however, felt that it would be preferable to experiment as indicated in my paper.

In reply to Mr. Fraser, I am inclined to agree that the more correct trend upon which development of the undertaking is to be based should have been a projection at a higher rate than that shown in Sheet 1. I am satisfied the economy of Salisbury is well founded upon the healthy state of agriculture in the district and principally upon the welfare of the tobacco industry. If this is the case, given normal conditions I should have anticipated a progressive increase following that normal before the war. It is however probable the shortage of consumer and capital goods which will be felt for some years after the war has ended

will retard the development and probably reduce the rate nearer to the figures utilised.

Unfortunately the development of the protection of the distribution system has not caught up with the growth of the undertaking. It was intended that the main network should consist of 33,000 volt feeders from the power station in three sets of rings, making a total of six control switches from the power station. The 11,000 volt network would in due course have power injected at selected points which can be picked up from the system layout attached to the paper. Unfortunately the extension of supply proceeded at a rate which did not enable the department to proceed sufficiently rapidly with the extension of the 33,000 volt feeder system. The use of earth leakage protection and the system selected must therefore be regarded as temporarily inadequate for the problems involved. Unfortunately I have available, now that I have left Salisbury, no particulars of the protective system to enable me to deal more fully with the queries raised in regard to setting values. The explanation given, however, will indicate that it was not anticipated because of the temporary nature of the protection that all contingencies could be properly met. Mr. Fraser's comments are therefore useful as an indication to others that the system protection shown is not entirely satisfactory.

Automatic reclosing fuses are fitted with delaying action which merely prevents the reclosure of a fuse after the first one has blown. The settings being experimented with are 30 and 60 seconds. The maximum commercial variation which was settled in the design of the tap changing equipment was fixed at 2%. Unfortunately during the war all automatic equipment was placed out of commission because of the number of men released for active service which prevented the department continuing the service of every form of equipment as was the case before the war. It will, I think, be appreciated when it is realised a total of 50 members of the staff was released, that something had to suffer and what was being done before could not continue to the same extent. It was therefore only a short while before the conference commenced that one or two tap changing transformers were recommissioned and no doubt the variations of 4% noticed are possibly due to inaccurate functioning of the regulators. A maximum variation of 1½% obtained in Johannesburg is very creditable.

Experience on the Salisbury system has demonstrated the advisability of separate compartments for the transformers. The final decision is, however debatable and must depend in every case upon the conditions particular to an area. Several cases occurred where transformers fitted with special artificial rubber gaskets suffered from the perishing of the gasket, leading to complete loss of oil between one inspection and the next. It was felt for this and other reasons that separate compartments were advisable and facilitated the use of louvred walls to improve ventilation which could not be justified if in the same compartment H.T. and L.T. switchgear were installed.

In regard to teething troubles on reinforced concrete standards, I can only record that they were of such a minor nature as to make any record thereof of negligible value to anyone. Probably the most difficult task in introducing them was to convince the personnel and

natives that the standards would not collapse or disintegrate whilst being erected. Once confidence was established it was found the staff treated the poles in the same manner as they would a wooden or tubular steel standard.

It was not considered that the difficulties encountered in obtaining an effective operating range for the wireless communication system were due to the output of the transmitter.. The skip distance, distortion and interference during stormy weather are the main problems to be solved. As indicated in my reply to Mr. Eastman I feel the rural area will have to depend upon a carrier system although in town a two-way radio telephone system is probably more useful.

All lubricating and insulating oils are dealt with separately and checks kept upon acidity, etc. plotted on graphs so that a sudden change can be noticed and action taken.

In reply to Mr. Stevens, I quite agree with him that the proportion of statistics etc. prepared by the Association should be the subject of special attention by the executive. A subcommittee might deal with the whole aspect of statistics and submit a report to some future convention. Comparisons to be of any use must have some common basis. Unless the statistics enable an engineer to work out the common denominator much of the value of the figures is lost.

I will now read you the reply which we have obtained to a telegram Mr. Eastman was asked to send to the Controller of Building Materials in the Union as a result of discussion at the executive meeting. It is as follows:—

> "Procedure in regard to obtaining heavy electric plant from U.S.A. is similar to obtaining such plant from U.K. Advisory Committee will require to draw up programme to U.S.A. in a similar manner and applicants to provide same information to Committee for that purpose."

The telegram was sent at the request of Mr. Powell, who might want some heavy equipment from America.

**Mr. Rettie** (Bulawayo): Mr. President,—I understand that you are unable to proceed to Bulawayo, so I take this opportunity to thank you on behalf of the Railway Administration for the very helpful co-operation we have always received from you in connection with all matters pertaining to the supply of electricity. Nobody regrets your departure more than I do, but I have realised for some time that it had to come, and we can only express the hope that you will be very happy and successful in your new sphere and that you will never have any occasion to regret the change. A nice compliment was paid you the other night by a member of the City Council when he stated that Mr. Clinton was leaving Salisbury and they were very sorry, but that he was too big a man for this city and they could hardly expect to keep him in Salisbury at the salary the Council was prepared to pay. Now there I think it showed the weakness of the municipal organisation by which municipalities have a fixed scale of salaries, whereas in the commercial community they pay a man what he is worth.

I again thank you, Mr. President, for all you have been to me during the period you have been in Salisbury.

**The President:** I would only say this before the Mayor speaks that the greatest pleasure you have given us is the way you have enjoyed yourselves here.

**The Mayor:** Mr. President and Gentlemen, – I move the adjournment of this convention to Bulawayo, and in doing so I take it that you have really achieved something here and that your deliberations have done some good.

I agree with the last speaker who referred just now to the commercial value of our electrical engineer. The trouble about a small town is this, that the commercial value of our engineer might be such a large sum of money that it would take half the rates.

When I was in Johannesburg at the last congress and I invited you to come to Salisbury I promised you that it would not be an austerity congress. I do not know whether we have altogether maintained our reputation here (*applause*) but what we have done during this week is what we have always done on other occasions for other congresses, and we hope to do the same in the future. Salisbury has tried to maintain its reputation for hospitality, and it is hoped we have not fallen down.

We did intend to go with you to Bulawayo, but have one or two rather important matters on hand next week. There are some reports to consider in regard to our financial affairs as well as other matters, so that it is not possible for any of us to go to Bulawayo, much as we regret missing the opportunity. Personally, I would like to have gone there, but there is another congress starting this morning in connection with the St. John's Ambulance and council is giving a public luncheon on Monday. For that reason it is not possible for me to go. After that several of us have to leave for a conference at the Victoria Falls. I would mention that we used to have our municipal conferences in various towns just the same as you do; but recently the venue has been the Falls. There is a very good hotel with a good hall in which to carry on debates. Besides that there is the river to fall into and the falls to fall over (*Laughter*). So I would suggest to you people from South Africa that you hold your congress not in one of the smaller towns in the Union; but that it might be a good idea to hold it at the Victoria Falls. There will, of course, be a large number of town councillors in the Union who have never seen the Falls, so it will be a good opportunity to encourage the principle of conferences.

It is a long time since you held your first congress in Salisbury, but I hope it will not be too long before you hold another in Southern Rhodesia. We always like to see the people come from the Union and we feel that a congress such as this does have beneficial results. It enables you to take back some knowledge of Rhodesia and encourages the policy of co-operation.

I again thank you for having paid us this visit and I hope you have thoroughly enjoyed yourselves and that you will also have a great deal of enjoyment in Bulawayo.

**Councillor Gibb** (Salisbury): The Mayor has left me, I am afraid, very little to say, except that I should like to re-echo his sentiments especially about visiting the Falls. It is certainly an ideal place. I can give my own experience last year. It is a very good spot to hold

meetings, besides which you are not very far from the bar in case you should need any refreshment. As I say, I can only repeat the sentiments which have been so well expressed by the Mayor and say how pleased we are that we have had such a representative gathering of the electrical world visiting our city.

I acknowledge our indebtedness to the Association for coming to Salisbury, especially when our City Electrical Engineer is just on the point of leaving our service. We appreciate the fact that Mr. Clinton is not only your President and our City Electrical Engineer, but he is doing very valuable work and I hope he will continue to do so for many years in South Africa as a whole. I believe that in the Union where he is going you will receive him with open arms. You will certainly have the advantage of the experience he has gained in Rhodesia to help you in regard to your problems in the Union, and I have no hesitation in saying that in Mr. Clinton you have a decided acquisition.

I have little further to say except to express my own personal feeling and to say that I am very sorry indeed that I cannot accompany this convention to Bulawayo. The Mayor has already told you the reason why we cannot go and I apologise to you for our absence.

May I be allowed to second the adjournment of this convention to Bulawayo, which the Mayor has proposed.

**The President:** I should just like to record my appreciation of the manner in which you have allowed me to carry on my duties as president with such a lack of experience.

**Councillor Ferry:** Through you, Sir, I should like to take this opportunity on behalf of the citizens of the Mother city, which as you are aware is the legislative capital of the Union, to thank you from the bottom of my heart for the wonderful way in which you have received those of us who have come from Cape Town. I can assure you that it did not take us very long, Mr. Mayor, to appreciate the beauty and, more particularly, the hospitality of your City, and when I return to Cape Town I certainly will endeavour to preach the gospel of how extremely well we were received in Rhodesia and particularly in Salisbury, and I will, to the best of my ability, do what I can to make closer the relationship existing between the Mother City of the Union and Rhodesia. I see no reason why commercial, industrial and particularly tourist traffic should not be stimulated and relations brought closer together. At the same time I extend a hearty invitation to all Rhodesians to visit us in Cape Town. I know, of course, that many of you do so already, and I need not enlarge upon the attractions of Cape Town and of the Cape Peninsula to Rhodesians. We have surroundings which are second to none, and it is also our intention to make Cape Town the greatest tourist centre in the Union to which we hope to attract visitors not only from Rhodesia but from every part of Africa and the world.

I will add in conclusion that I am the son of a pioneer of Rhodesia. My father was here almost 50 years ago, and again it gives me great pleasure to thank you for the hospitality you have given those from the Mother City of the Union.

**Councillor Eden:** Mr. Mayor, on behalf of Kimberley I find it difficult to express my feelings and my appreciation of the very high degree of organisation and the extreme hospitality that we have found wherever we have gone in Rhodesia and particularly in this city of Salisbury. I, like others, have been struck by the beauty of the city and by the quality of its citizens. We from Kimberley, as well as other places in the Union, will certainly take away with us happy memories of our very pleasant stay amongst you. Personally I am sorry to go. Those of us who are visiting the Falls will also have additional memories to take back with us, and I think it is quite a good idea for us to meet together under such conditions.

I should also like to take this opportunity of congratulating you, Mr. President, on the excellent way in which you have conducted this convention. I should also like to thank the Mayor and Council of Salisbury on behalf of the delegates here for allowing us to have the use of the Council Chamber for our discussions. To our hosts I also extend our meed of thanks. It was a bright thought to give us as sponsors some local ladies and gentlemen to see that we found our way about. I think as far as our discussions are concerned that whatever has been said has been of a constructive nature with the intention of helping and not of hindering.

In conclusion I can only repeat that I am quite at a loss to find adequate words to express our gratitude to you, Mr. Mayor, to the city councillors and to the people of Salisbury for giving us the welcome they have and for sending us on our way with the pleasantest of memories.

**Councillor Beckett:** Mr. President and Gentlemen,—As one of the very humble folk from Johannesburg, I can only say like the Pharisee of old that in coming up here, though not actually coming to scoff, I have certainly remained to pray. I have heard some debates as to whether there was any great benefit to be got by different municipalities throughout the country sending their non-technical councillors to a convention of this sort, and I must admit that I have on one or two occasions expressed that sentiment, but after having taken part in this convention I have been obliged to change my views.

There are one or two features that I have found particularly valuable in connection with this convention. First of all I would like to refer to the efforts that you, as president of this convention, have put forward. It has been said that you are too big a man for the City of Salisbury, and while I realise that Salisbury is growing and is likely to do so in the future, I think that what has been said about you is prefectly true, that you are too big for this City. You have shown in one way how big you are in the controlling of these meetings, and if what you have done here is any guide to your future capabilities then I am certain that if there is one place in South Africa where your merits will be appreciated and will be paid for, that place is Johannesburg.

I also feel I would like to offer our thanks to the different electrical engineers present here from the various municipalities of the Unon. As consumers I am afraid we have never really appreciated our engineers as much as we should, and it is only when you come to a gathering

of this nature and you realise the amount of loyalty and service that is being put in by the men in control of the different undertakings that you represent, without regard to the amount of money you are paid as salaries, which I admit are much too low, that one can fully appreciate all that this means. To me, as an individual, I must say the amount of loyalty I have found among municipal engineers is amazing. Your object in coming here has been to find out different things that would benefit the various communities which you represent. In other words, your object is to give more and more service to the people in these different municipalities. Very little time has been devoted to a discussion of salaries during this convention, but if ever I have the opportunity of talking to members of other municipalities of the Union I shall tell them how lucky they are in having men so loyal and true in their service as the engineers whom I have had the pleasure of meeting during this convention.

There is also one thing I should like to mention which has struck me as a result of my visit, and that is the open and healthy life which you people live in Rhodesia. I must say I envy you, who are able to live your lives as I imagine it was intended you should live them. We in the Union unfortunately find our days are 24 hours too short and we are constantly in a hurry. It has taken this trip to Rhodesia to bring us to our senses and make us realise that if we go on as we are doing it must end in disaster. If this trip has done nothing else it will have taught us, or some of us, to emulate your example, and I for one promise you that in the near future I am going to try to come up to Rhodesia and find something to do, and if I find it profitable enough I intend to make Rhodesia my home. I feel certain that the same feeling inspires other members, and in repeating the expressions of thanks which have already been uttered by others, we from Johannesburg also want to express our very sincere gratitude and appreciation to you for all you have done.

**Councillor Webb:** Mr. President,—On behalf of Benoni I also would like to congratulate you on the way you have conducted the business of this convention. I would also like to compliment you for bringing our deliberations away from the State Lotteries Hall to this Council Chamber where conditions are much more satisfactory and pleasant all round. There is one suggestion I would make as a result of our experience in Rhodesia, and that is that at future conventions the first three or four days should be devoted to jollification and then we should get down to business. (*Laughter*). Mr. Mayor, to you especially I would like to offer my congratulations on the almost royal welcome we have received. There are even displays of flags and illuminations in the streets. (*Laughter*).

**Mr. Powell:** I regret very much that my councillor member from Bloemfontein is not here to-day to extend our thanks for this pleasant experience. I am afraid I cannot compete with the eloquence of the previous speakers, but in my humble way as an engineer I do sincerely wish to express the thanks of Bloemfontein for the generous welcome and the wonderful hospitality which you have afforded us. I would make special reference to the arrangements which you have made for entertaining our wives. I think the arrangements were perfect. As far

as I am concerned I can truly say that my wife, during the time she has been here, has been no hindrance to me whatever. (*Laughter*).

Next year you will be welcomed to Bloemfontein for your conference and whilst I am afraid we cannot hope to compete with Salisbury as regards hospitality and arrangements generally, I can assure you that we will do our best to make your stay a happy one, so I hope that all who are present here to-day will endeavour to come to Bloemfontein next year, and that you, Mr. Mayor, and you, Mr. President, will also attend that conference and give us the pleasure of renewing the acquaintance we have made at Salisbury.

**Mr. Phillips:** All the speakers so far have spoken on behalf of the towns. I as Vice-President of this Association would like to offer on behalf of the members of the Association to you Mr. Mayor, and the City Council our very sincere appreciation for all you have done for us in Salisbury. I am sure that any other city would find it difficult to equal, let alone surpass, this entertainment you have provided for us. I should also like to take this opportunity of expressing the wish that all the members, delegates and visitors who have attended here will find it possible to come to Bulawayo next week where we also will do our best to entertain them. I am afraid it will not be possible in the brief time you will be with us to give you entertainment of the same high order as in Salisbury, but we will certainly endeavour to round off the convention in such a way as to augment the lasting impressions of Rhodesia which you have obtained here.

**Mr. Russell:** There are amongst the visitors several representing commercial firms, and on their behalf I should like to express thanks. Without attempting to make a speech I would heartily re-echo the sentiments already expressed by other speakers. To you, Mr. Mayor, I think, is due a special message. You have mentioned the reputation which Salisbury enjoys, and which to some extent I think was founded on the convention held in 1934 under the guidance of Mr. Fereday. You certainly tackled a big job in competing with his ideas of entertainment, but please accept my assurance that next time you see him in the street you can hold up your head and look him straight in the face. (*Hear, hear*).

**Mr. Eastman:** The previous remarks of delegates concerning the city's hospitality have already voiced our appreciation so well that I do not think there is any need for me to speak on that aspect of our convention, but I feel that I should, on behalf of the delegates, express our sincere appreciation of the enormous amount of work done in the background by the staff of our president's undertaking to make our visit so interesting and to arrange that everything worked so smoothly. There is always a great amount of work done in the background for these conventions which hardly ever appears on the surface—work done by people who are perhaps forgotten, but without whose efforts we could not have experienced the amenities of this convention we have enjoyed.

Also, Mr. President, this will be the last opportunity that we will have of tendering to you our good wishes in your new sphere of activity. (*Hear, hear*). As an Association we shall be very sorry indeed when the time comes that you will be unable to continue your presi-

dency. In your new sphere of activity we wish you every success, and hope also to see you at our future meetings. (*Applause*).

**Councillor Davis** (Springs): On behalf of the rising city of Springs allow me to congratulate the Mayor and the residents of Salisbury on the splendid manner in which they have received us. We have observed that Salisbury is a very spacious city, and we have discovered also on this occasion that the kindliness of the people is as spacious as their streets. (*Hear, hear*).

**Councillor Symons:** Allow me to associate myself with the views just expressed. This unbounded hospitality has made my time most pleasant. You, Mr. Mayor, in opening this convention touched on one point—the barriers that divide us. We hope and feel certain that the barriers between the Union of South Africa and Rhodesia will one day disappear. (*Hear, hear*). Especially do we look forward to the time when custom barriers will disappear. (*Laughter*). I had the pleasure last night of meeting Mr. Rowe, who I understand has taken up a new job in the Department of Commerce, and I think his job will be very much lighter when that day comes.

There is just one other point I would like to stress and that is the matter you raised in reply to questions about your paper, Mr. President: if the reports are circularised to councillors in time for them to have some discussion in committee or otherwise, you will find more councillors will attend your conferences. It was not without some difficulty that I was able to come myself, but I can assure you I will take back to my council some very good impressions which I have gained here. It is obvious that very much good work is done, although, in spite of this being a Convention of Electricity Undertakings, no doubt very much of the work is done in the darkness. (*Laughter*).

**Mr. Stevens:** Speaking as a delegate from Natal, I am very sorry the "big guns," Mr. Kinsman, City Electrical Engineer of Durban, and Mr. Hallé, City Electrical Engineer of Pietermaritzburg, were unable to be here to-day to express the appreciation of the Natal delegates for all that has been done for us during our stay in your charming city. As it happens, it falls to my lot, Mr. Mayor, to thank you very much indeed.

The motion was put and agreed to and the **CONVENTION ADJOURNED TO BULAWAYO.**

## MONDAY, 21st MAY, 1945

### THE CONVENTION RESUMED AT BULAWAYO AT 2.15 p.m. IN THE SMALL CITY HALL

**Mr. Phillips (Chairman):** Ladies and Gentlemen,—I am occupying the chair this afternoon because Mr. Clinton is unable to come down to Bulawayo, and under our constitution, as vice-president I must occupy the chair in his absence. My first pleasant duty is to welcome the Mayor and Mayoress of Bulawayo, Mr. and Mrs. D. Macintyre, on your behalf and to ask His Worship to re-open this convention which was adjourned at Salisbury.

**The Mayor of Bulawayo** (Mr. D. Macintyre): Mr. Chairman, Ladies and Gentlemen,—It indeed gives me great pleasure to welcome the delegates and the ladies accompanying them to this convention of the Association of Municipal Electricity Undertakings of the Union of South Africa and Rhodesia; which is being resumed at Bulawayo. I understand that the Association is some 30 years old. I believe it was known at first as the Association of Municipal Electrical Engineers, but ten years ago that title was altered to the very high-sounding one under which you are now known. I believe also that the name was altered so that it would permit of councillors and the gentlemen who look after matters in the various centres to attend your conventions. I do not know why this was done, except that probably it was so that you would be able to tell the councillors what you thought of them when you got to the conference without their being able to retaliate. (*Laughter*). It is only natural that you should want to tell the boss sometimes what you think, and that may have been one of the reasons. But there may be another reason. It is always easier to get councillors to send electrical engineers to these conferences when the councillor knows that he may also be one of the lucky ones to be chosen to go.

Now in welcoming you I want to express my thanks and the thanks of the people of Bulawayo to the originator of this suggestion that the proceedings of the last few days might be held in Bulawayo. Bulawayo is desirous of being not a bit behind the City of Salisbury in any respect. I believe the Mayor of Salisbury told you that 50 years ago they had to come here and conquer Matabeleland. Now I want to tell you something else, but I will do so to-night at dinner when we are gathered together in a still happier atmosphere.

I have been wondering why you had this convention and if the object was to develop the knowledge of electricity on behalf of mankind in general, or if it just provided you with the opportunity to have a real old 'beano' once a year. But when I look round at this gathering of scientific experts I believe that some of my previous conclusions must have been far from the mark, and not altogether fair to the engineers and delegates at this convention. Electricity has now become the most important motive power in the world, and I presume that you gentlemen therefore represent the most important and largest industrial undertaking in South Africa. During the last 50 or 100 years it has made unlimited progress, something that your predecessors hardly thought possible, and I have no doubt that similar progress will be made during the next half century, and there is no reason why some of you gentlemen present here to-day may not become similar benefactors to mankind. You will probably assist in lifting the veil or the scientific curtain which enshrouds the mysteries of electricity, and who knows but that one day some of you may not wear the mantle of your distinguished predecessors such as Lord Kelvin and others to whom the world owes so much. In this I wish you all success.

I am not really opening your conference today, because I understand you opened it at Salisbury, and in addition to what I am saying now I hope to get a further opportunity of addressing you this evening. So I will not do more at this stage than to extend to you all a very

J. W. PHILLIPS, President, Bulawayo

sincere and hearty welcome to this city both on behalf of my fellow councillors and myself, and to express the hope that your stay in Bulawayo will be a happy one and that your deliberations will be fruitful and full of information. I have, therefore, great pleasure in declaring this session of the convention duly opened.
(*Hear, hear*).

**The Chairman:** Mr. Mayor, I thank you very much indeed on behalf of the Association for your kind welcome. We had a very successful conference in Salisbury, both from a business and a social point of view, and I am sure that everybody will thoroughly enjoy this Bulawayo conference just as much as they did in Salisbury.

**Resignation of President.**

I have here a letter received from your president, Mr. J. S. Clinton, tendering his resignation from the presidency of this Association. I am sure you all agreed with me that we very much regret having received this letter. It will be necessary to accept the resignation because Mr. Clinton, as you are aware, is leaving the municipal service, and under our constitution it is impossible for him to remain as president. I am also sure that you will agree with me that it is a great pity that we are losing such a valuable and experienced electrical engineer from this Colony. (*Hear, hear*). As I said in Salisbury when moving a vote of thanks for the presidential address, this Colony is losing the services of a gentleman which it can ill afford to do. Not only do we recognise his great talents, but we have a very sincere and affectionate regard for Mr. Clinton, and we feel certain that he will make a success of his new venture in the Union. I have no doubt whatever that he will do so, because he has the skill and the ability as well as the personality which are essential for success. These qualities have won for him the esteem of everyone with whom he has been connected in Salisbury. I am afraid, therefore, that with much regret we must accept Mr. Clinton's resignation, but Rhodesia's loss is the Union's gain, and I am sure that there are many municipalities in the Union who will be only too pleased to take advantage of his services in a consultative capacity should they be required.

It will now be necessary to call for nominations for the office of president.

**Mr. Eastman:** Mr. Chairman, Mr. Mayor and Gentlemen,—We all greatly deplore the circumstances under which Mr. Clinton has tendered his resignation, but of course it was not altogether unexpected, and you have already shown how sorry you are that he should leave us. But we are also very pleased that Mr. Clinton, realising what must happen, allowed us to do him the honour and to do ourselves the honour at the same time of electing him as our president for the short period during which it was possible for him to hold the office. So we have the pleasure of knowing that at any rate we did our best for one of our colleagues of whom we think so highly.

Persons in the Rhodesias, together with the Union, form our Association—an Association which I venture to suggest is having more and more influence in municipal electricity undertakings as time goes on, for the benefit of the electricity supply industry in general—and I am glad to think that there is in Rhodesia a gentleman with the

very high qualifications necessary to foster our interests and those of municipal electricity supply in general; a man so well qualified that we feel sure he can ably fill the office of president and take Mr. Clinton's place. I refer to Mr. J. W. Phillips, City Electrical Engineer of Bulawayo, and I have much pleasure in proposing that he, now our vice-president, be our president for the ensuing year. (*Hear, hear*).

**Mr. Fraser:** It is my pleasant duty to second the proposal before the convention. Mr. Phillips is not so well-known to those of us from the Union, but it has been our privilege during the last few days to hear and see what wonderful work he has done, not only for Bulawayo but also for Rhodesia as a whole. As you know, Mr. Phillips is now holding a dual job. I understand that, as well as being Chief Electrical Engineer of the Bulawayo Municipal Undertaking, he is also Director of Production for Rhodesia. I am sure that we could not do better than to ask Mr. Phillips to accept the position of president of this Association for the ensuing year.

**The Chairman:** Are there any other nominations? There being no other nominations I declare myself duly elected.

**His Worship the Mayor** then invested Mr. Phillips with the insignia of president.

**The President:** Mr. Mayor, Ladies and Gentlemen,—First of all I thank you very much indeed for the honour you have done me. At the same time I regret that such a step was necessary for the reasons mentioned just now, namely, that we are losing such a valuable man as Mr. Clinton. However, I will endeavour to maintain the traditions of the Association during the ensuing year until I hand over to my successor in Bloemfontein next year. I would also like to take this opportunity to endorse the welcome which our Mayor has extended to you all, and to say how glad we are that it has been possible to arrange to carry out a portion of the business of this convention in Bulwayo on this occasion. This is the first time that our Association has met in Bulawayo. When you came here ten years ago we entertained you on the way through and on the way back again, but no business was actually done, so as I say, I am glad that it has been possible to work in two days' business this time. I know you have enjoyed yourselves very much in the Legislative Capital, and we are sure that you will enjoy yourselves equally in this, the most important commercial and industrial city in Southern Rhodesia. (*Laughter*).

It is not my intention to make a presidential speech this afternoon because you had one in Salisbury, and the time at our disposal will not allow of it. But I should like to avail myself of this opportunity to refer to the presidential speech of my late chief, Mr. Metelerkamp, in Salisbury at the last meeting of this convention ten years ago. He made some remarks which I have been looking up, and I feel that this is an opportune moment to refer to them. He referred to the five towns, Bulawayo, Salisbury, Gwelo, Gatooma and Umtali, and gave figures relating to them. He gave the figures of consumption of electricity and this is what he said: "It will be noted that the average

consumption per head of population of 752 units is extraordinarily good, and the low average receipt of 1.88d. per unit sold is a forecast of the future electrification of Rhodesia." Now I would like to give you the corresponding figures for last year—ten years later. The figures are 2,840 units per head of population and the average receipts are .804d. In other words, consumption per head of population has risen four times and the receipts—that is the price received per unit sold—has been reduced to less than half. (*Hear, hear*).

He also said this: "It is believed that the annual consumption in Bulawayo of 4,180 units per consumer is higher than in any other town in the Union." Again I would like to inform you that in ten years that figure of 4,180 units per consumer has now risen to 14,800 units per consumer, again nearly four times. So it is clear that Mr. Metelerkamp was not unduly optimistic when he made that statement, as we engineers are so often accused of being. In fact, I very much doubt whether even he visualised such a tremendous rate of progress.

On that occasion he also made this statement with regard to water-heating: "The problem of water-heating has produced interesting discussions at each convention. I am of the opinion that until such time as we can put forward a scheme for hot water in the household which is acceptable to the householder from every point of view, there is no hope of fully developing the domestic load." Now, without anticipating Mr. Sibson's paper this afternoon, I would like to say how we have overcome that problem in Bulawayo. As you probably know—as you certainly do know if you have read his paper—this town has a domestic tariff which is based on four units per room at 6d. and the balance at ½d. per unit, and if there is a water-heating installation the secondary rate of ½d. is reduced to seven-sixteenths of a penny. There is thus a saving on the whole consumption, and not only on the water-heating consumption. This has been very effective and successful, and has increased the number of water-heating consumers tremendously.

It now only remains for me once again to welcome the delegates and visitors to our city and to express the hope that your visit to this country has provided sufficient interest to compensate you for the inconvenience in travelling which we all experience in these days. (*Applause*).

# Election of Vice-President

**The President:** The next business is the election of the vice-president, and it gives me very great pleasure to nominate my successor in that office. As you are aware we go to Bloemfontein next year for our convention and I should, therefore, like to propose the City Electrical Engineer of Bloemfontein, Mr. W. N. Powell, as our vice-president. (*Hear, hear*).

**Mr. Wright:** Mr. President, Mr. Mayor, Ladies and Gentlemen,—It gives me pleasure to second the nomination of Mr. Powell as vice-

president. Mr. Powell is, comparatively speaking, a newcomer to this Association. I believe that this is the first occasion on which he has attended a conference, but the interest he has displayed and the ability which he has shown in debate has impressed everyone present. I may also tell you that he has been making copious notes and obtaining all the information he could on the social arrangements made both here and in Salisbury, and I think that if you accept him as your vice-president you will have found the right man, and that you will be assured of just as successful a time in Bloemfontein as you have had in Salisbury and Bulawayo.

**The President:** Are there any other nominations? There being no other nominations I declare Mr. Powell vice-president of this Association for the coming year.

**Mr. Powell:** Mr. president, Mr. Mayor, Ladies and Gentlemen, — I thank you indeed for the honour you have conferred upon the municipality which I represent by electing me your vice-president for the ensuing year. I am sure that Bloemfontein and even the Orange Free State will value the honour which you have done me this afternoon, and I am sure that when you assemble there next year for the convention they will be able to show you, in some tangible form, their appreciation.

In the meantime, it is my duty to assist you, Mr. President, in your onerous duties, and I trust that by the time we meet again at the next conference you will find no cause to regret the decision which you have made to-day. (*Hear, hear*).

**The President:** Before calling upon Mr. Sibson to deliver his paper I should like to explain that lately he has had a very difficult job to carry out here, first because I have been away a great deal, and secondly because we are designing a new power station. We are particularly grateful to him, therefore, for finding the time to compile a paper to be read before this Association.

I would also like to take advantage of this opportunity to pay a tribute to Mr. Val Davies, who was consulting engineer at Bulawayo for quite a number of years, and who, I am glad to see, is with us to-day. Perhaps some of you will remember my paper which was read to this Association in 1934. If so, you will recollect that the Bulawayo undertaking was acquired from the Bulawayo Water Works Company and Mr. Val Davies was called in to design a new power station. He decided to instal steam turbines, and thereby started up quite a big controversy. Some ratepayers wanted gas engines instead of steam turbines, and as you all must realise from the progress made, we should have been in a sorry plight had not the Council wisely carried out Mr. Val Davies' plan. We must pay tribute, therefore, to Mr. Val Davies who put us on the right road in those early days. Not only did he design the power station, but he was also consultant when the distribution system was laid out, and again he looked well ahead and wisely installed a 11,000 volt distribution system. He also introduced the room tariff in Bulawayo, which had the effect immediately of reducing the price of electricity very substantially. So altogether we have a lot to thank him for, and I have much pleasure in taking this opportunity to make these remarks concerning him.

# The Development of the Bulawayo Electricity Undertaking

by A. R. SIBSON, A.M.I.E.E., A.M.(S.A.)I.E.E.
*Assistant City Electrical Engineer*

In 1934 the Association held its Annual Conference in Southern Rhodesia. One of the papers presented to that Conference was given by an Assistant Electrical Engineer, who was temporarily filling the position of administrative head of his department. I refer, of course, to Mr. J. W. Phillips, the present City Electrical Engineer of Bulawayo, who gave a very excellent survey of the development of the Bulawayo Electricity Undertaking.

Today the Association is again meeting in Southern Rhodesia, and again an Assistant Electrical Engineer who is temporarily acting as administrative head of his department has been asked to give a paper, and it would be an impertinence for me, therefore, to fly in the face of Fate and do other than continue in the footsteps of Mr. Phillips by continuing the history of the Bulawayo Undertaking, taking up the story from the point at which it was left off.

This paper will, I am afraid, prove to be a somewhat disjointed and sketchy survey, since the circumstances existing at the time render it impossible for the Writer to give it more than the most cursory attention at such moments as it is possible to set aside from time to time.

For the sake of clarity I shall consider the Undertaking under four main headings, and trace the development of each of these in turn, namely (a) Generation, (b) Distribution, (c) Financial, and (d) Administration and General.

**Generation.**

The position in 1934 was that a total of 8,000 kw. of generating plant was installed, this consisting of two 1,000 kw. Bellis and Morcom turbines, one 2,000 kw. B.T.H. turbo-alternator, and one 4,000 kw. Bellis and Morcom G.E.C. turbo-alternator. The boiler plant consisted of four 11,000 lbs. per hour Babcock and Wilcox units and two 22,000 lbs. per hour boilers by the same manufacturers. The peak load carried in the winter of that year amounted to 3,775 kw., or very nearly the total capacity of the Station with the largest unit out of service.

Additional plant was already on order, consisting of one 5,000 kw. B.T.H. turbo-alternator and a further 22,000 lbs. per hour Babcock and Wilcox boiler. This plant was commissioned in February, 1935, and had been running for 18 months by the time the Writer arrived in Bulawayo.

For many years Bulawayo has been envied for its high thermal efficiencies, and even in 1934 the figure for the year was 12.4% on units sent out, the load factor in that year being 47.8%, while a total of 12,200,000 units was sold. Last year the thermal efficiency on units sent out was 17.25%, and when it is remembered that the Station is still operating at 200 lbs. pressure and 600°F. total temperature, perhaps even our hereditary competitor from Pretoria will join in the applause.

It is thought that the principal contributing factors to the long tradition of high efficiencies of which the Station is proud are:—

(i) The fact that plant extensions had taken place in such a manner that the major portion of the load throughout the year could be carried by the newest machine running alone. This meant that the fullest advantage of the increasing efficiencies of the larger units was taken.

(ii) The fact that load factors have always been sufficiently high to make it unnecessary to bank boilers during the early hours of the morning. It is a fact that during the last 10 years at least, no boiler has ever been banked in the Bulawayo Station on account of variations of load.

The general growth, both of peak loads carried and of installed plant capacity, over the years is shewn in the attached diagram, figure 1, from which the expansion of the Undertaking can be gauged far better than by giving details here of the annual loads carried.

As mentioned in the previous paper, it had already become evident by 1934 that the original two 1,000 kw. machines were too small to serve any useful purpose, so that when the extension which took place in 1938 was being planned, steps were taken to replace these two machines by one 7,500 kw. turbo-alternator occupying the same space. The two small machines, together with some of the smaller boilers, were sold to the Gatooma Municipality, and the new B.T.H machine, together with two Yarrow 40,000 lbs. per hour boilers, was commissioned in May, 1939, so that the total capacity of the Station was now 18,500 kw., or a safe peak capacity of 11,000 kw., allowing for the largest machine to be out of service.

It will be noted from figure 1, however, that by the winter of 1939 a peak load of 10,900 kw. was being carried, and a report urging still further plant extensions was therefore submitted to the Council. The war intervened and the Council, quite justifiably, hesitated in the face of further capital expenditure, preferring to see what the effect of war conditions might be on load growth. More than a year went by while evidence accumulated indicating that growth, if anything, was slightly accelerated by the war, and tenders for a 10,000 kw. turbo-alternator and associated boilers were finally invited in November, 1940.

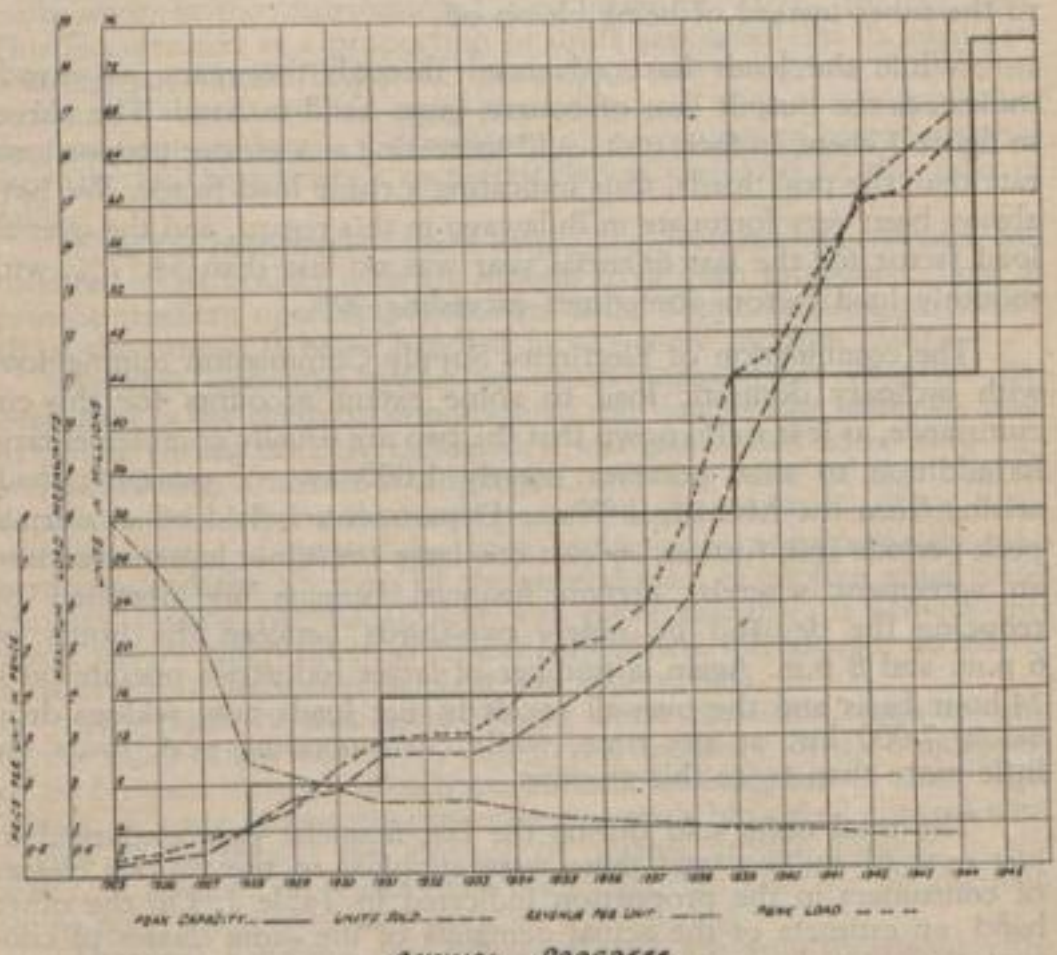
By this time we were well beyond the danger mark and, due to the inevitable delays associated with war conditions, this latest extension was not finally commissioned until the end of last year. It is indeed fortunate that during 1943 and 1944 acute shortages of all classes of materials, and restrictions on building programmes, imposed limitations on load development. Even so, the winter of 1944 saw loads of the order of 16,500 kw. being carried, with a total installed plant capacity of only 18,500 kw.

The position today has been momentarily eased with the commissioning of the latest 10,000 kw. extension, but the relief will be of short duration, and with the next addition of plant capacity, later to be discussed, not likely to be in operation before 1948, at least one and probably two anxious winters lie ahead.

Nor will the loss of purely war-time demands ease the situation appreciably. The demand of the four Air Force camps that have been

established in the district totals approximately 1,300 kva. This represents rather less than a year's normal development in ordinary times, but any relief which even the total elimination of this load in the near future might afford, pales into insignificance beside the known additional demands that will require to be met shortly. One consumer alone has just added 1,600 kva. to the connected load of his installation, while the general industrial development of Bulawayo has recently begun to shew very lively signs of expansion.

I do not expect to obtain much sympathy from members of the Association who must, in many cases, have gone through similar anxious periods to those we suffered last year—and, it is feared, to those yet to be experienced—but I am sure they will appreciate the feelings of the operating staff when, a week before the recent boiler extension was available, the refractory brickwork of the two largest existing boilers literally dropped to pieces, the boilers having been in service for more than 12 months without cessation. By drastic patch work we were able to hold things together without dropping any load until the new boilers were steaming.



ANNUAL PROGRESS
FIG. 1.

An interesting experience arose out of the unusual conditions existing at that time. The only portions of the new boiler equipment which had finally not come forward were the soot blowers, and when the boilers were put into service it was decided to risk running them without soot blowers, except in the case of the furnace tubes, blowers being borrowed from the existing boilers for that purpose. We watched the boilers and economisers with some trepidation, expecting to find them rapidly choking with soot and necessitating temporary lay-offs for cleaning. The weeks spun into months, however, without any apparent disorders developing, and when the boilers were eventually taken off after a normal run of nearly four months, we were amazed to discover all surfaces very much cleaner than we had ever found them previously.

Arising out of that, it is now our rôutine procedure to operate only the furnace soot blowers on the Yarrow boilers, and we have confirmed without doubt that the boilers remain much cleaner under these circumstances. It is presumed that no matter how carefully soot blower circuits are blown down, a certain amount of moisture inevitably is blown into the flues, thereby causing the soot to adhere to the tubes instead of being blown off.

While the loads have advanced through the years, as already indicated, the output has, of course, gone hand in hand. The curves in figure 1 shew, in fact, units sold increasing at a greater proportional rate than the peak loads, thus indicating a rising load factor. We have always been very fortunate in Bulawayo in this regard, and the over-all load factor for the last financial year was no less than 54.77%, with monthly load factors sometimes exceeding 70%.

The combination of Electircity Supply Commission mining load with ordinary domestic load to some extent accounts for this circumstance, as it is well known that the two are usually complementary. In addition to this, however, nearly 1,000 kw. of pumping load, arising from the Municipal Water Department, is laid off at normal peak periods and, further, at least one large consumer has entered into an agreement whereby certain financial benefits are obtained by reducing the demand by nearly two-thirds between the hours of 6 p.m. and 8 p.m. Again, a number of larger industries operate on a 24-hour basis and the over-all result is that loads now seldom drop below 7,000 kw. at any time, while corresponding peak loads are little more than twice this amount.

The total units sold during the last financial year amounted to just over 67 million, and these were supplied to the various classes of consumers in the proportion indicated in Table 1. On the other hand an estimate of the actual demands of the same classes of consumers was made during last winter's highest peak load and the proportion of these demands is given in the second column of the Table.

TABLE I.

| Class of Consumption | Proportion of Units sold | Proportion of highest Peak Load |
|---|---|---|
| Electricity Supply Commission, principally for mining purposes | 16.27% | 8.8% |
| Heavy Industry ... ... ... | 23.80% | 13.7% |
| Railways ... ... ... ... | 3.40% | 2.1% |
| Air Force Camps... ... ... | 10.48% | 7.9% |
| Lighting, Domestic and Small Power Consumers ... ... | 35.78% | 60.3% |
| Municipal Supplies, including Street Lighting and Water Pumping ... ... ... | 10.27% | 3.5% |
| Power Station Auxiliaries ... | — | 3.7% |
| | 100.000% | 100.0% |

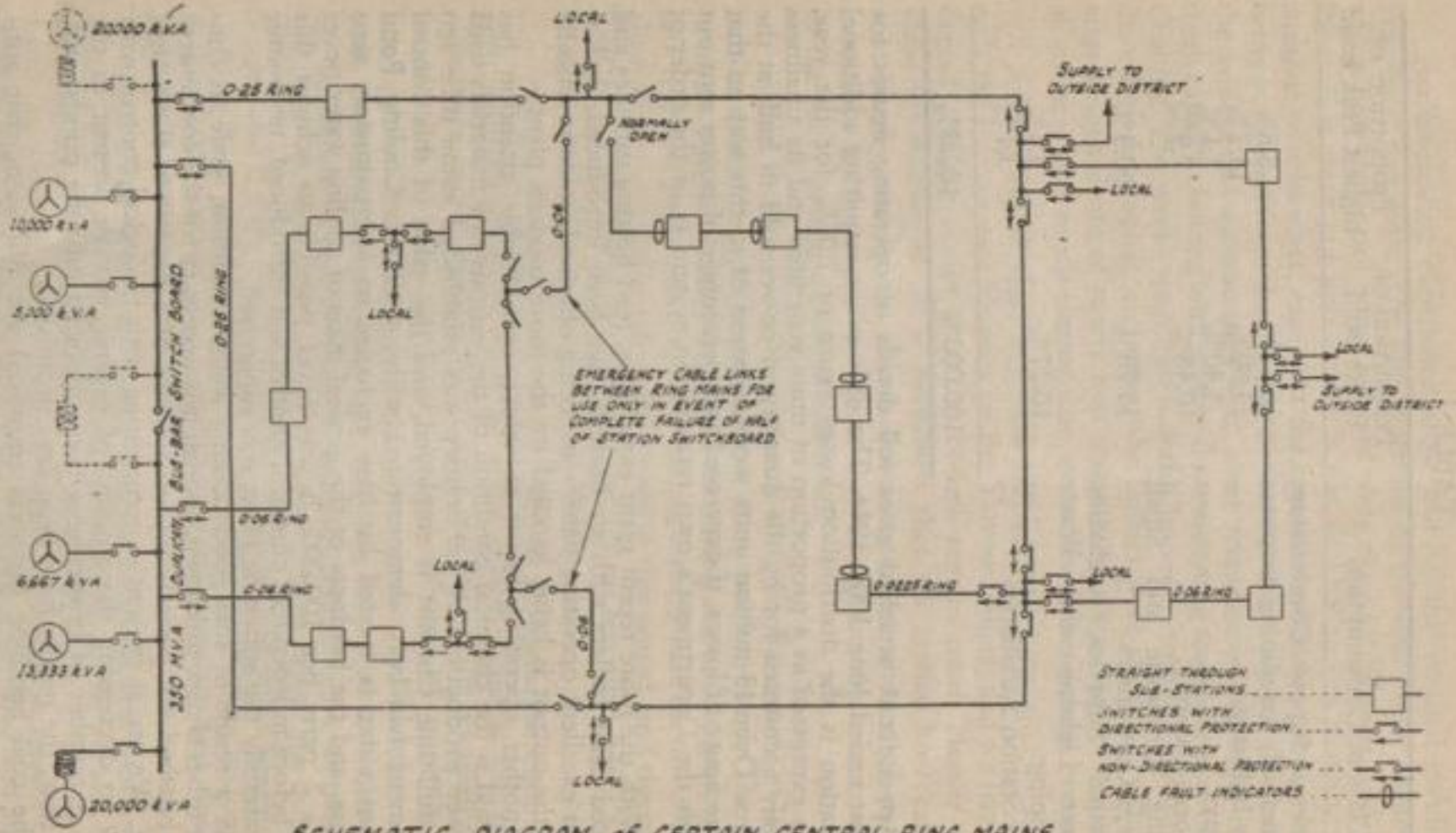
Appendix A attached gives full details of operating figures for the year ended June 30th, 1944. The only point requiring additional explanation is the distribution losses figure of 7.07% for the year. This is expressed as a proportion of units generated and its smallness is largely accounted for by the quantity of power sold in bulk at the bus-bars. Over 13 million units were disposed of in this way so that the true figure of losses, if expressed as a percentage of power sent out through the Department's own reticulation system is of the order of 9.3%.

With the more recent plant extensions, feed heating turbines and balanced draft boilers with air heaters have been introduced, and at present excellent operating figures are being obtained, since practically all of the output is being handled by the more modern plant.

Another operating factor to which considerable attention has been paid is the chemical condition of the various raw materials used in power production. A Laboratory was established some time ago and a full-time Chemist is employed, and the value of this control department has been demonstrated without doubt. Cooling Pond make-up water is treated by base exchange to approximately zero hardness, and the hardness of the general mass of cooling water never exceeds 2 parts per 100,000. It was never possible to achieve this result before independent chemical control was introduced, no matter how carefully the softening plant was supervised.

As a result of this good cooling water condition, scale in condenser tubes is now unknown, though it is necessary for the condensers to be brushed out periodically on account of a deposit of slimy algal matter. We are at present experimenting with biological control with a view to decreasing the amount of organic growth present in the water. A number of bream have been imported into the ponds, and, up to now, the results have been very promising.

The coal handling methods employed are still somewhat antiquated but are nevertheless the most economical under the existing




SCHEMATIC DIAGRAM of CERTAIN CENTRAL RING MAINS.

FIG. 2.

circumstances. The present Station was designed initially for a total capacity of the order of not more than 8,000 kw., and the whole layout of buildings and plant is suited to a Station of this limited capacity. In times of peace the recent 10,000 kw. extension would never have been made to the existing Station, but would, instead, have been the first unit of a new large Station of modern design. Though we have, therefore, with some difficulty fitted 28,500 kw. of plant into the original layout, it was found impracticable to introduce overhead coal bunkers and all the other accoutrements of an up-to-date coal-handling system. With the price of native labour averaging 1/7d. per day per head it is still economical to off-load coal trucks manually, and the onyl mechanical equipment in use consists of drag scrapers, coal crushing plant, and scraper conveyors discharging coal into an elevated bin, from which it is tapped by cocopans and taken to the Boiler House where small electric hoists lift the coal into the boiler hoppers.

In the more recent boiler installations we have developed a method of ash handling which is simple and efficient. A chute at the rear end of the boiler carries ash direct into a water-sealed recess in the floor of the basement, from whieh it is scraped by hand and discharged into cocopans. This method ensures the quenching and cooling of the ash, together with complete dust elimination. The ash, after elevation to small ash bunkers by electric hoists, is taken away by motor transport to various places in the commonage area where ash is needed for road filling or other purposes. The demand for this ash, both by the Municipal Roads Department and by private individuals has always exceeded the supply. and it is hoped that this happy state of affairs will continue for a considerable time. In the most recent boiler extensions we have provided dust extractors, since the siting of the Station within built-up areas is rendering smoke elimination more and more desirable.

A survey of the development of the Bulawayo Electricity Undertaking would not be complete without a short glimpse into the plans that are being made for the future. A few years ago the Writer investigated the possibility of transmitting large blocks of power from the Zambesi, or alternatively from the site of the coal deposits at Wankie, and as a result of this it appeared that there would be economic advantgaes in providing the power requirements of Bulawayo from such sources, when the total load had risen to the order of 120,000 kw. Plans had already been commenced on a new power station, designed for this total capacity, which it was desired to site as near as possible to the centre of gravity of the load. It was found that the existing Power Station Reserve was just capable of adequately accommodating such plant, and the obvious advantages of utilising this site were, therefore, overwhelming, bearing in mind the probable limit of total capacity.

Water supply is usually a major problem in deciding upon the site of a large Power Station, but in Bulawayo we have reconciled ourselves indefinitely to the use of the town water supply, since there are no sites within striking distance where any other adequate supplies could be obtained. The cost of town water is, at the moment, high: we are paying 3s. per 1,000 gallons, but it is hoped that this price

will be materially reduced in the future. The present rate of consumption is almost exactly one gallon of water per unit generated.

After a careful survey of the various relevant considerations, steam conditions for the new Station were set at 600 lbs. per square inch nominal pressure, and 825°F. nominal temperature. We were fortunate in obtaining the sanction of the Heavy Plant Committee in London to the purchase of plant nearly a year ago, and orders have been placed for one 15,000 kw. turbo-alternator and two boilers each of 80,000 lbs. per hour mcr. steaming capacity.

The Station has, of course, been designed on modern lines and the initial installation is expected to cost half a million sterling. By the time this paper is being read it is hoped that work on the building foundations and the erection of the first Cooling Tower will have commenced.

**Distribution.**

The history of the distribution system from 1934 is a story of continued expansion, which it will be simpler to study under the respective headings of Town Area and Peri-Urban Areas.

*Town Area.*

Reference was made in the previous paper to the establishment of 11,000 volts as a primary distribution voltage, and its use has been justified without question. The original town system comprised a number of underground Sub-stations and most of these still exist, in some cases equipped with 500 kva. transformers, although originally intended only for 100 kva. units. The almost universal use of electricity for domestic purposes has involved the development of very heavy loadings and the opportunity has been taken wherever large blocks of flats or similar buildings were erected to incorporate a Sub-station designed to carry not only the load of the building itself but the requirements of adjacent areas. At the same time every effort is being made to supersede the limited underground Sub-stations though there are six still in use. The elimination of these has now become an urgent necessity, due to the increase in fault capacities available with the addition of generating plant, since the underground chambers cannot possibly accommodate switchgear of adequate rupturing capacity. Indeed, as with most growing towns, this question of fault capacity has become a serious problem and a long term policy has been established whereby it is hoped to eliminate repeated and costly replacements of gear in the future. Switchgear of 250 mva. capacity is now being adopted on all major ring mains and, after due consideration of the various conditions obtaining, we have adopted protection based on the use of directional and non-directional relays. While such protection would not be considered adequate in a large city, it is felt that the needs of Bulawayo will be amply served thereby for many years to come. By this means continuity of supply at a number of selected points can be ensured, and only the lesser important areas are not guaranteed 100% continuity. The system is broadly outlined in figure 2, which is a diagram shewing Ring Mains and Sub-stations as they will shortly be arranged.

It will be seen that the central Station Switchboard is of 350 mva. capacity and that reactors are being introduced between bus-bar

sections and in the first two new 15,000 kw. generator leads to limit the total available capacity to 350 mva. Subsequent generation extensions will almost certainly be at 33 kv. and the use of primary reticulation at this voltage is contemplated. By that time it is possible that the network will be interlinked with the major systems of the Electricity Supply Commission, and a host of new problems will arise.

To return to the present, we are experimenting with the use of Ferranti fault indicating relays which, clamped over ring main cables in Sub-stations, register when fault current passes. By this means it is hoped to be able to trace faults very rapidly and enable supplies to Sub-stations not equipped with directional relays to be restored with the least possible delay.

We have in past years experienced considerable difficulty as a result of the incidence of faulting on 11 kv. joint boxes. Manufacturers, straining competitively, have progressively reduced the sizes of boxes until it is felt the danger point has been reached. Most of the older boxes installed 15 to 20 years ago are still in service, shewing no signs of trouble, while many of the more recently installed boxes have broken down within a few months of installation. We are at present, inclined to return to the practice of using large boxes with masses of bituminous compound in favour of the smaller oil-filled sleeves. Migration of oil from the sleeve into the cable has proved to be the principal cause of failure, and in many cases this has been associated with collapsing of the lead sleeve, due to the partial vacuum created. After suffering many box failures the boxes on a certain length of cable were dug up and it was found, in each case, that the lead sleeves had collapsed and that further failures would almost certainly arise. As a temporary measure new sleeves were fitted and filled with hard-setting compound, though this volume of solid compound is, of course, unlikely to be sufficient to ensure the filling of all interstices. However, no further failures have so far occurred on this particular length. It is felt that research is still needed before the question of satisfactory through-jointing of 11 kv. cables has been settled.

In many of the outlying town Sub-stations automatic on-load tap change transformers are being used to an increasing extent. Outgoing low tension cables are normally controlled by means of iron-clad switch fuse units, fuses of a high rupturing capacity type being employed. Ammeters or tong-test chambers are provided to enable the load on such circuits to be observed. For the greater part, low tension reticulation in the town area is carried out with overhead lines and services, though in the centre of the city low tension cable is now being used in many cases.

The increased cost of meters and service equipment generally has led us to consider most carefully the advisability of providing all ordinary domestic supplies with single phase services, and this has now been adopted as far as the town area is concerned, the consumers being sufficiently close together to ensure satisfactory diversity and balance on the three phases. Experiments with magnetically operated automatic switches in place of the usual service fuses have been so successful that it is our intention to standardise on this equipment as soon as it becomes available again. Not only are phase and earth

faults interrupted almost instantaneously, but it is also a simple matter for the consumer to restore his supplies if the fault is a transient one. A further advantage is that during thunderstorms the switches operate so rapidly that the meter is protected from damage to a far greater extent than where ordinary fuses are used. Incidentally, we frequently suffer the loss of as many as 30 or 40 meters during one heavy thunderstorm and, while these are to a large extent repairable, the financial loss is considerable.

Where service fuses are used, that is on poles or elsewhere, we have standardised on hrc. fuses, principally because of their greater reliability over long periods and the more efficient grading that they make possible.

*Peri-Urban Areas.*

The Electricity Supply Act of 1936, which brought about the creation of the Rhodesian Electricity Supply Commission, also required existing Undertakings to take out licences, in terms of the Act, for stipulated areas. In the case of Bulawayo the area comprised a circle of radius 10 miles from the Power Station, and the obligation was placed upon the Council of giving supplies within that area. As far as these peri-urban areas are concerned all the supplies are carried out by means of overhead 11 kv. lines and, after a considerable amount of trial and error, we have standardised a form of line construction which is illustrated in figure 3. It will be seen that two earth wires are supported above, so placed that the well-known semi- and quarter-circle profile covers the whole of the copper conductors. The neutral of the low tension system is split into two wires each of half the cross-section of the phase leads, and so placed that, if necessary, they can be straddled with cradle wires. These neutrals are run on earth pins, instead of insulators, which effectively earth the neutral system at each pole. The three phase wires run in vertical construction immediately below. High tension lines alone average in cost about £400 per mile, using wood poles at approximately £1 each. When available we prefer to use second-hand rails which, in 33 ft. lengths, cost about £2 10s. each. Heavy tubular steel poles are, of course, used at straining points and for pole-mounted transformer installations.

With regard to lightning protection on high tension lines, we have found that the most effective form of protection can be obtained by a length of armoured cable. It is our normal practice to employ about a quarter of a mile of such cable at the commencement of all overhead line feeds, but we have, in addition, found that the insertion of a length of cable in the middle of a line has proved very beneficial. There is no doubt that many theorists will hold up their hands in horror at such a proposal and speak with bated breath of resonance and the reflection of transient surges. Probably under certain conditions trouble might arise from these sources, but we have, so far, been fortunate in the two or three lines where this method has been adopted and the length of cable has shewn itself to be one of the finest absorbers obtainable.

We are making increasing use of weight-operated auto-reclose switches on overhead high tension lines, and better security of supply during the lightning season is being obtained by this means. A desirable feature not yet associated with this type of gear is some form of definite

minimum time relay to enable positive discrimination to be made. No doubt manufacturers will surmount this hurdle in due course.

As stated above, the neutrals of 3 phase 4 wire low tension systems are positively earthed at each pole, and we have accordingly arranged that all installations in outlying districts remote from water supply networks shall be earthed to the system neutral, since in this country for a great part of the year any other form of earthing is problematical in the extreme.

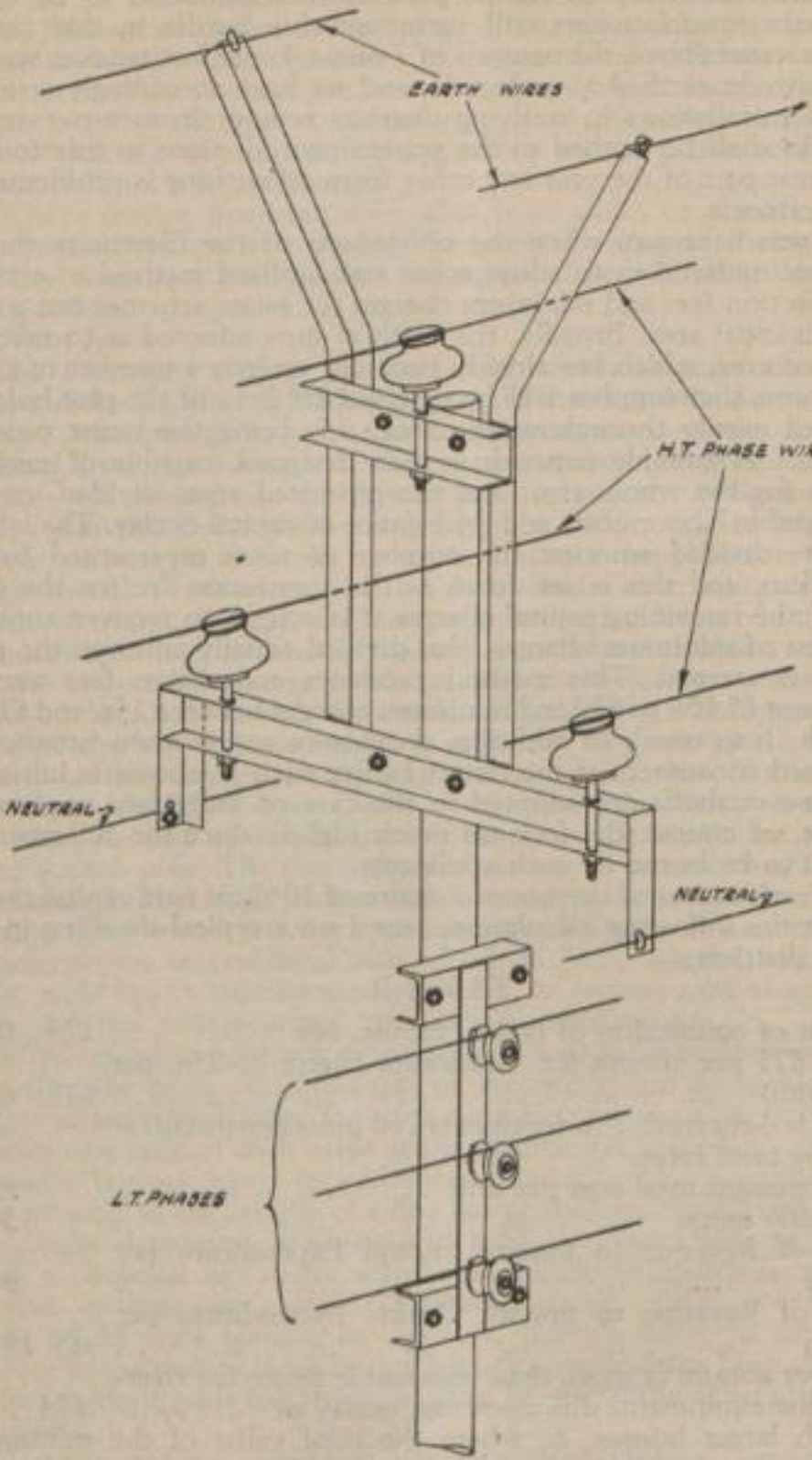
It was necessary when the obligations of the Electricity Supply Act were undertaken to adopt some standardised method of arriving at connection fees and minimum charges for estate schemes not within the Municipal area. Broadly, the method now adopted is to take the proposed area, which has already been cut up into a number of plots, and assume that supplies will be required by 25% of the plot-holders, dispersed evenly throughout the area, this being the worst possible condition. A suitable network is then designed, capable of easy expansion for the whole area, and the estimated costs divided into (a) irrecoverable labour costs and (b) balance of capital outlay. The labour costs are divided amongst the number of plots represented by the 25% taken, and this is set down as the connection fee for the area. 20% of the remaining capital charges it is sought to recover annually by means of minimum charges, also divided equally amongst the plot-holders concerned. This method produces connection fees varying from about £7 10s. to £30 and minimum charges between 15s. and £2 10s a month. It is usual, in addition, to require a minimum number of guaranteed consumers at the outset before such a scheme is initiated. The same methods are adopted in the case of individual applicants, but here, of course, the fees are much higher, since the full costs are required to be borne by such applicants.

In justification of the use of a figure of 20% on nett capital outlay I submit the following calculation, based on a typical dwelling in the country districts:—

TABLE II.

| | | | |
|---|---|---|---|
| Nett cost of connection of typical House, say ... ... | £75 | 0 | 0 |
| 20% of £75 per annum (i.e. Minimum charge of 25s. per month) ... ... ... ... ... ... ... | £15 | 0 | 0 |
| If house is 4-roomed, 25s. represents 266 units per month at existing tariff rates. | | | |
| Average present total cost per unit ... ... ... ... | | | .68d. |
| Cost of 266 units ... ... ... ... ... ... | | 15 | 1 |
| Balance of Revenue to finance Capital Expenditure per month ... ... ... ... ... ... | | 9 | 11 |
| Balance of Revenue to finance Capital Expenditure per annum ... ... ... ... ... ... ... | £5 | 19 | 0 |
| At 8% per annum (a more than reasonable figure for overhead line equipment) this covers an outlay of ... ... | £74 | 7 | 6 |

With larger houses, or where the total value of the minimum charge is not absorbed, the margin available is greater, while the secondary tariff rate of $\frac{3}{8}$d. per unit is so near to the average cost per unit sold that consumption in excess of the value of the minimum approximately balances additional costs.




STANDARD H.T. & L.T. LINE CONSTRUCTION.

FIG. 3.

**Financial.**

The financial background of the Bulawayo Undertaking today is extremely sound and is, no doubt, the envy of many similar Undertakings in the Sub-Continent. As stated in Mr. Phillips' original Paper, electricity supply in Bulawayo was for the first 26 years in the hands of a private company, as was also the Water Supply Undertaking. It was not until 1924 that these Undertakings were expropriated by the Council and, by this time, the Council had acquired the habit of financing its existing activities from funds available from the usual sources, such as rates, etc. The principle of retaining water and electricity accounts separate for book-keeping purposes was associated with the further principle of retaining these Undertakings financially distinct. The only contributions from electricity profits that have ever been allocated elsewhere—and these have been comparatively small—have been those made to the Water Department to assist this Department during years following heavy capital expenditure. As a result of this policy it was possible soon after the Undertaking came under municipal control to re-invest considerable sums within the Electricity Department itself. Most of these funds were used to finance distribution extensions, though in addition to this further reserves were accumulated which enabled loan liability for major generation extensions to be reduced. Something over £300,000 worth of capital expenditure has been financed in this way, so much so that there are practically no loan liabilities at all in respect of the distribution system.

In order to ensure that this extremely satisfactory state of affairs shall continue, it is the practice to allocate, as an expenditure item in lieu of Capital charges, approximately 8% of the capital value of the distribution system every year, since this is the approximate amount that could be expected to be required had this Capital expenditure involving the raising of loans. This annual allocation has been found to be sufficient to enable all new extensions to be carried out and, of course, it increases every year as accretions to the capital invested in distribution take place. It will be appreciated that this allocation is purely a departmental affair and differs from fixed loan charges, since it could, if necessary at any time, be temporarily suspended. This financial foundation enables us to face the future with much more equanimity than would otherwise be the case.

As at the 30th June, 1944, the total loan liability of the Undertaking was £495,054, while the capital charges on this amount totalled £51,727. It will be seen that these charges represent approximately 10.4%, which is a very large contribution, made up roughly as follows: Interest 4.16%; Loan Redemption 1.35%; Renewals or Obsolescence Fund 4.42%. In addition an amount of £2,500 in respect of acquisition costs was included: the purpose of this latter amount was described in detail by Mr. Phillips in his previous paper. Most of the loans concerned are long term, 30 years or more, while the estimated life of the plant has been set at a very conservative figure of 15 years. This accounts for the small redemption payments compared with the high contributions to the Obsolescence Fund. The acquisition costs payments will cease as from next year, and it may be considered

desirable before long to reconsider the plant life period upon which Obsolescence Fund payments are calculated. These high obsolescence charges add, of course, still further to the soundness of the financial structure of the Undertaking.

In Appendix B will be found a copy of the Revenue and Expenditure statements for the year ended 30th June, 1944, and this is largely self-explanatory. It will be noted that the costs per unit of fuel, water and ash handling—that is the variable charges—total .214d., a very attractive figure upon which to base the unit rate of maximum demand tariffs. The contributions in lieu of Capital charges are seen in the amount of £29,969 for the year, and the bulk of this was used to finance Distribution extensions.

In Appendix C will be found copies of our existing tariff of charges, but we have of course, a number of special agreements for bulk supplies to larger consumers, based on both maximum demand and flat rate systems.

**Administration and General.**

In 1943 the office accommodation was increased and now consists of a double-storey Administrative Block on the same site as the Power Station.

There is a general tendency in large Municipal Undertakings for the administration to be sited remote from the Power Station, or Stations proper and this is usually due to the fact that such Stations are a considerable distance from the centre of the town. While the Bulawayo Power Station is not exactly in the centre of the town, it is not sufficiently distant to be inconvenient from the point of view of the public and the administration generally. On the other hand, there are considerable advantages in having the technical staff near at hand to the operating units, and we are, therefore, proposing to retain the arrangements now existing.

The Administration Block houses, apart from the chief officials, the general office, under the control of a Chief Clerk, where, in addition to usual routine work, all job costing is done, a Drawing Office, a Joint Meter Reading Branch and the Consumers', and Installation Inspecting Departments. The Joint Meter Reading Branch requires some explanation. A year ago the Council decided to combine the reading of water and electricity meters, and this work is now handled by one Sub-Department, with the introduction of considerable economies.

The total European staff of the Undertaking amounts to approximately 86 employees, of whom at the moment 17 are on active service. These totals include 17 apprentices and two pupils, of whom 10 are on active service. For an Undertaking of the size to which the Bulawayo Station has now grown, this staff is considered, in normal times, to be quite inadequate, but it is, of course, impossible under existing conditions to correct the position, and the maintenance of supplies during the war years has proved a very considerable strain upon the personnel. As soon as staff become available it will be necessary for considerable additions to be made, and it seems likely that, from our point of view at any rate, the post-war problem will be not the finding of jobs for ex-servicemen, but the finding of sufficient men for the available jobs.

Apropos of discussions that took place at the last Conference at Johannesburg, we have recently appointed an Apprentice Power Station Operative, and it is hoped by this means to initiate the training of the necessary personnel for Power Station operation in Southern Rhodesia, which is thought to be a long-felt want.

It might also be of interest to refer here to the meter and electrical testing facilities existing. We have recently added a new Meter Test block to the Department's facilities, and this is equipped with all the provisions for standardisation and testing normally to be found in the larger Undertakings. This Sub-Department, which will later be under the control of a Test Superintendent, handles all electrical tests from house meters to the testing of heavy plant and switchgear. A considerable portion of the equipment on order has not yet been delivered, though it is hoped before long to have everything in full working order.

A reference to Consumers' Fault Service might also be of interest. Provision at the moment consists of two Duty Electricians on shifts which cover the period 7.20 a.m. to 8.20 p.m. The number of faults occurring outside of these hours, under normal circumstances, are so few as not to warrant the maintenance of continuous service. The Duty Electricians, however, take spells of stand-by availability and are provided with telephones, so that they can be contacted, if necessary, with very little delay. This system has proved adequate for the present needs of the Department.

I would like to apologise again for the scrappy nature of this paper. It is hoped nevertheless that some points of interest have been introduced and that the visit that this Conference will shortly pay to the Power Station will have been made more enlightening. When the Conference meets again in Southern Rhodesia, presumably in another 11 years, I think we shall have completed the transition now taking place from a small town Undertaking to one associated with the larger cities of Southern Africa, and I am sure we may look forward then to another paper from another Assistant Electrical Engineer on the still further development of the Undertaking with which I am happy to be associated.

## TARIFF OF CHARGES AND CONDITIONS FOR THE SUPPLY OF ELECTRICITY

SCALE 1—LIGHTING TARIFF.

(a) *General*:

Electrical energy for lighting purposes in all classes of premises, except as otherwise provided for, will be supplied on the following sliding scale, subject to a minimum charge of 2s. 6d. per month:—

| | |
|---|---|
| The first 500 units per month ... ... ... ... | @ 4½d. per unit. |
| The next 500 units per month ... ... ... | @ 3d. per unit. |
| All units in excess of 1,000 per month ... ... | @ 1½d. per unit. |

(b) *Athletic and Sporting Clubs*:

Electrical energy for lighting purposes will be supplied to approved Athletic and Sporting Clubs at a flat rate of 2d. per unit, subject to a minimum charge of 2s. 6d. er month.

SCALE 2—DOMESTIC SUPPLY *to all areas within the Commonage Boundary, except Kenilworth.*

(a) Electrical energy will be supplied for domestic purposes to:—

(i) Private houses;
(ii) Boarding houses;
(iii) Private hotels;
(iv) Flats (excluding common corridors, which shall be charged under Scale 1 (a);
(v) Hostels and residential institutions, excluding Government school hostels;
(vi) Homes run by charitable institutions;
(vii) Private nursing homes and maternity hospitals,

at the following monthly rate, subject to a minimum charge of 2s. 6d. per month:—

| | | |
|---|---|---|
| The first 4 units per living room per month | ... ... | @ 6d. per unit. |
| All further consumption during month | ... ... | @ ½d. per unit. |

(b) On application to the City Electrical Engineer, the secondary rate ½d. above will be reduced for consumers who have one or more approved electric water heaters in use (of not less than 10 gallons total capacity) to ⅛d. per unit. To obtain this reduction the water heaters must have been installed to the satisfaction of the Council's Installation Inspector, and the reduction will only be maintained while the water heaters are connected to the Council's mains and are working satisfactorily.

SCALE 3 SHOP WINDOW LIGHTING.

Electrical energy for outside electric signs, external floodlights, and lighting of shop windows in all business premises, blocks of buildings, etc. (with the exception of bioscopes and theatres) when in the opinion of the City Electrical engineer such lighting will augment the lighting of public thoroughfares, will be metered on a separate meter and charged at the undermentioned rate, subject to a minimum charge of 2s. 6d. per month:—

| | | |
|---|---|---|
| The first 40 units consumed per month | ... ... | @ 3d. per unit. |
| All further consumption during month | ... ... | @ 1 d. per unit. |

Electrical energy for the operation and lighting of Petrol Pumps will also be supplied in terms of the above tariff.

SCALE 4—COOKING, HEATING, WATER HEATING, REFRIGERATION AND AIR CONDITIONING.

(*Separate Metering*)

(a) Electrical energy, when separately metered, will be supplied to all classes of premises for cooking, heating, water heating and air conditioning purposes, and for use in all types of refrigerators, except refrigerators operated by motors in excess of ⅛ h.p. rating, at a flat rate of ½d. per unit, subject to a minimum charge of 2s. 6d. per month.

(b) For the exclusive purpose of demonstrating electrical appliances which are capable of taking supply from the Municipal mains, electrical energy will be supplied through a separate meter at a flat rate of ½d. per unit, subject to a minimum charge of 2s. 6d. per month.

SCALE 5—INDUSTRIAL POWER

Electrical energy is supplied for power and for industrial processes in business establishments, not elsewhere provided for herein, on the following scales:—

(a) *Sliding Scale:*

| | | |
|---|---|---|
| The first 1,000 units per month | ... ... ... | @ 1½d. per unit |
| The next 1,000 units per month | ... ... ... | @ 1d. per unit |
| All further consumption per month | ... ... ... | @ ¾d. per unit |

*Note* 1: The above scale 5(a) is subject to a minimum charge of 2s. 6d. per month per installed h.p. or part thereof up to a total of 60 h.p. Appliances rated in k.w. shall be subject to the minimum stated above on the equivalent h.p. basis, which shall not be less than 2s. 6d. in any month.

*Note* 2: Lighting will be included at Industrial Power Rates where there is an installed capacity of 50 h.p. or more, and when, in addition, a sub-station has been provided free of charge for the purpose of housing the Council's high tension switch-gear and transformers.

(b) *Maximum Demand Scale within the Commonage Boundary:*

Supplies of electricity will be given under the following standard two-part rates:—

| For extra high tension supplies 11,000 3-phase. | For 400 230 volts, 3-phase, 4-wire. |
|---|---|
| A demand charge of 7s. per month, per K.V.A. of maximum demand, plus | A demand charge of 8s. per month, per K.V.A. of maximum demand, plus |
| An energy charge of 0.3d. per unit supplied. | An energy charge of 0.325d. per unit supplied. |

Such supply rates to be subject to the following conditions:—

(a) The amount payable in any month in respect of maximum demand shall not be less than 70% of the amount payable in respect of the previous highest demand recorded during the period of 12 months immediately preceding.

(b) A minimum payment of £600 per annum shall be made in respect of demand and energy charges taken together.

(c) The energy charge to be based upon coal cost of 15s. 8d. per short ton delivered at Power Station Siding. Should the cost of coal be greater or less than this amount, the energy charge shall be increased or decreased according to a coal adjustment formula to be attached to the contract documents.

(d) Before electrical energy can be supplied at this rate a contract for supply for two years will be entered into.

(e) Each consumer taking supply of E.H.T. electrical energy under this tariff shall provide, free of charge, accommodation to the approval of the Council for the housing of the Council's transformers and switchgear. The Council reserves the right to use any of its equipment so installed for supplying adjacent networks, in addition to the consumer's own requirements.

(f) The Council reserves the right of decision as to the voltage at which a supply would be given, but should it be necessary, for technical reasons, for the Council to meter supplies at Low Tension, where all the conditions enumerated in the foregoing paragraphs (a) to (e) above have been complied with by the consumer, then the tariff laid down for E.H.T. supplies shall be applicable provided that the registration of the energy meter shall be subject to a 5% increase to cover transformation losses.

SCALE 6—DOMESTIC SUPPLY TO HILLSIDE, SAUERSTOWNSHIP AND KENILWORTH.

(a) The first 4 units per living room per month @ 6d. per unit.
All further consumption per month @ ½d. per unit.
Subject to a minimum charge of 5s. per month.

(b) The secondary rate of ½d. per unit under (a) above will be reduced to ¼d. per unit if approved electric water heaters are in use in compliance with the conditions laid down under Scale 2 (b).

*Note:* For the purpose of assessing the number of living rooms under Scale 6, the definition as contained in Scale 2 shall apply.

SCALE 7—DOMESTIC SUPPLY TO ALL AREAS OUTSIDE THE COMMONAGE AREA (*Excepting Sauerstownship*)

(a) The first 4 units per living room per month @ 9d. per unit.
All further consumption per month @ ½d. per unit.
Subject to a minimum charge as laid down in the schedule.

(b) The secondary rate of ½d. per unit under (a) above will be reduced to ¼d. per unit if approved electric water heaters are in use in compliance with the conditions laid down under Scale 2 (b).

*Note:* For the purpose of assessing the number of living rooms under Scale 7 the definition as contained in Scale 2 shall apply.

**The President**: I am sure we all congratulate Mr. Sibson on his excellent paper, and I should just like to add what I omitted to mention before, that as a result of the considerable strain which has fallen upon Mr. Sibson due to the reasons already mentioned, his health has not been too good of late—therefore we appreciate all the more the efforts he has made to prepare this excellent paper for the convention.

TEA INTERVAL

**On resuming:**

**Mr. Fraser**: Mr. President and Gentlemen,—The Association is once again indebted to one of our engineer members for presenting us with such an excellent paper.

**(Communicated):** The Bulawayo Undertaking is to be congratulated on the high thermal efficiencies obtained at a steam pressure of 200 lbs. per sq. in. and 600 F. total temperature. The plant extension programme has been given as one of the probable reasons for this result. Although this may be correct, I feel that the policy adopted in planning the extensions is open to mild criticism on the grounds of lack of interchangeability of parts and the resultant wide range of spares that must be carried. No two machines are of the same capacity and the various types and sizes of boilers must undoubtedly raise maintenance costs. It is hoped that, in determining the sizes of machines and boilers for the new extensions, provision has been made to permit future expansion by means of similar units.

The load factor certainly has a big influence on the success achieved by the Undertaking—probably the biggest, and it says a lot for the past and present management that this problem has been solved so satisfactorily. Local conditions have a considerable bearing on load factor and the problem in some municipalities would appear almost insurmountable. Nevertheless, at least a partial solution can and must be found to the problem of low night load. In Johannesburg the winter peak load is in the order of 135,000 kw. at 6 p.m. and by 1 a.m. it drops to about 20,000 kw.

The experience with soot-blowers is very interesting and must result in considerable saving, but coal characteristics vary to such an extent in different localities that it is doubtful if soot-blowers could be discarded to any great extent. With the high pressures and temperatures obtaining in modern practice, the theory of "bonded deposits" becomes a very real one.

It is interesting to note that the proposed extensions to the Bulawayo Undertaking include plant to operate at 600 lbs. per sq. in. and 825 F. This is indeed a major step. I feel, however, that engineers are becoming obsessed with thermal efficiency and are inclined to forget that real efficiency is measured in £ s. d., or cost per unit sent out. To obtain high thermal efficiencies, elaborate and expensive plant must be installed and, unless coal costs are very high, it is probable that interest and redemption charges will outweigh the savings resulting from increased thermal efficiency. Maintenance costs are also considerably increased, particularly in this country, so far removed as it is form the manufacturers of the complicated and specialised equipment.

The long term view is perhaps the only justifiable argument in favour of high thermal efficiency power stations in this country. The wastage of raw materials during this war has been enormous and, for the welfare of coming generations, we must conserve coal measures by endeavouring to obtain as much power from one pound of coal as was previously obtained from two. This in all probability will result in a higher cost per unit sent out, and the only thanks the engineer is likely to get will be from posterity.

With regard to the 11 kv. ring main system, the author mentions that protection by directional and non-directional over-current relays is considered adequate for many years to come. In the diagram of Fig. 2 is shown so-called "straight-through" sub-stations, and I am not clear as to whether switchgear is included in these sub-stations controlling the ring feeders. Dependence on over-current protection entails long time lag settings on switches close to the power station, the maximum time of which will be even greater if switchgear is installed in the straight-through sub-stations. It would seem, therefore, that the provision of some instantaneous pilot wire protection is well worth considering.

The experience with the faulting of cable joint boxes due to migration of fluid compound is particularly interesting in that it further confirms the findings of so many other undertakings and renders still greater the obligation on cable manufacturers to find a solution to the problem.

Adoption of the practice of proviidng all domestic consumers with a single phase supply in an attempt to off-set the increasing costs of meters and services is one which warrants consideratoin by all supply undertakings. I feel that this is a matter which might well be dealt with by the Association, in order that some degree of uniformity may be laid down for the country as a whole. It is becoming increasingly apparent that the advantage, from the load balancing point of view, of providing two and even three phase supplies to domestic consumers is more theoretical than real, and introduces additional hazard, complication and cost.

The use of automatic circuit breakers in place of fuses for service connections should certainly result in a large reduction in the service required from stand-by officials and it would be interesting to hear whether experience shows any disadvantage in this arrangement.

The Undertaking's experience with regard to damage to meters in thunderstorms must surely be a record in this country, and the fact that in Johannesburg, where electric storms are fairly severe, nothing like this damage is experienced, seems to point to some inherent weakness in the line of meters being used.

Whilst the undertaking which I represent has not as yet combined all its testing activities under one sub-branch, I find it interesting to note that this is intended in the Bulawayo Undertaking.

**Mr. Val Davies** (Johannesburg): The mention which Mr. Sibson has made about taking over the concession company in Bulawayo gives one the opportunity of demonstrating the difference between private enterprise and municipal enterprise in running such a concern. The Bulawayo power station as it stands today is, in my opinion, a model undertaking, both technically and financially, and one cannot

help contrasting the present municipal scheme with the early efforts of the concession company to provide Bulawayo with a proper supply of electricity.

**Councillor Ferry:** Mr. President and Gentlemen,—There is one thing which I feel rather dubious about in connection with the paper we have just heard. In your remarks you mentioned standardistaion of a single phase domestic service in Bulawayo. Now in Cape Town we have adopted the three-phase system as a standard, and we not only consider that we get a better balance between phases, but we also provide a better service through the reserve supply—through the other two phases if one of them should fail. For instance, should the consumer be using a three-plate stove, and should anything go wrong with the single phase system, it is obvious I think that the whole stove would be out of action so to speak, but in Cape Town should anything go wrong with one of the phases you still have the other two as a reserve, and the additional cost, I believe, is only a matter of about £4.

**Mr. Wright:** I rise to pay tribute to Mr. Sibson for the excellent paper we have been presented with, and I say that advisedly because I think I am voicing the opinion, particularly of the engineers of the smaller towns, when I say that Mr. Sibson's paper was of very great value. I feel there is no necessity for Mr. Sibson to apologise in any respect as regards his paper. I say again that it is a paper which we, the engineer members representing small undertakings, have been particularly looking forward to.

I also want to congratulate the Bulawayo Undertaking on its great progress. It is recognised that electricity is something which is generated in order to be sold. That is to say, it cannot be stored up and put away like any other commodity. If you have a plant you must use it to its fullest capacity, and you must sell as much current as you can, and the only way to do that, to my way of thinking, is to do away as far as possible with all restrictions. If you can give the consumer a supply with all restrictions done away with, that is the ideal thing to aim at, and I think it is clear that in Bulawayo at all events they have been able to do this. We have been told that you cannot undertake water-heating during peak periods, but apparently Bulawayo can certainly do that. Pretoria is also doing it, and without any ill-effects so far as one can see, and I think they are going to reap the benefit of that to a very great extent in the fucure, because they are going to sell more electricity at a cheaper rate than ever before. That is what we are all cut to do.

Mr. Sibson mentioned the use of automatic circuit breakers on the consumer's supply side. I think automatic circuit breakers are the only things to use, but I should like to ask Mr. Sibson if the circuit breakers they have in use are of the single-pole type or if they have the neutral break, because personally I have been using single-pole type for some considerable time and I must say that I have found no use for the neutral break. Our experience is that it heats up and we have trouble. But the single break on the phase side gives every satisfaction, and I should like to see them standardised right through, and in that way getting rid of fuses on the consumer's installation.

He also made mention of the use of auto-reclosing pole mounted H.T. switches. We in Benoni have used them for some time. Our greatest trouble has been due to dust and keeping things clean. To keep them thoroughly efficient means cleaning at least once a week, and that is a rather expensive job, so I wonder whether similar trouble has been experienced in Bulawayo.

**Councillor Beckett:** Mr. President and Gentlemen: As one of those representing the rude and scoffing multitude—that is to say the people who are much more concerned as to whether there is any "juice" when they switch on, than just how that "juice" is produceed—I would like to offer my share of praise and congratulation for the excellent paper which has been delivered to us. During the last week or so, I have looked around wherever I have had the opportunity, and I feel in my own mind that if there is one spot in this continent of Africa which is due for a terrific amount of progress it is Rhodesia. (*Hear, hear*). And I somehow feel that, comparatively speaking, Rhodesia's growth is going to be just as great from now on as it has been hitherto.

I would not attempt for one moment to offer any measure of criticism in regard to this paper, because I am not an electrical man and I know so little about it, but I feel that what I said in Salisbury is very apt and worth repetition. Here we have a man who, during the very strenuous period of the war when supplies have been difficult and conditions exceptionally so, and whose health has to some extent suffered in consequence, has nevertheless been prepared to devote weeks, if not months, in getting out a paper of this nature. And for whose benefit? Certainly not for his own. That is why I feel that you engineers are deserving of so much credit from the Councils that you serve both here and in the Union. Your loyalty is unquestionable and you are deserving of the best that any Council can offer. I can only add, in conclusion, that I feel sure the efforts which Mr. Sibson has put into this paper are going to bear fruit in the future and will prove to be a source of inspiration to the younger engineers who are coming along, so that when the time arrives for Mr. Sibson to move into some higher and even more responsible position, as no doubt will be the case some day, those who follow after will be able to do so on the sound lines which have already been laid down both by you, Mr. President, and by your Assistant City Electrical Engineer. (*Hear, hear*).

**Mr. Eastman:** Mr. President,—The paper now submitted to us by Mr. Sibson gives figures fully bearing out the Mayor's opening remarks that this city is the most progressive commercial community in Southern Rhodesia. Here we have a city which, for domestic purposes, is all-electric, but even so, the total sales of electricity for purely domestic purposes, small power consumers, and so on, is only 36% of the total output. The whole of the remainder of the output, except ten per cent, goes into industry of one kind and another.

From the information given in the paper it would appear that the Bulawayo Undertaking is in a better financial position than any other similar undertaking in Southern Africa, and that this is largely due to the progressive outlook which has been directed to the question of

the disposal of surplus revenue over expenditure. Your municipality evidently puts it all to the benefit of the undertaking, and thereby to the benefit of the consumers and the city. In this connection need I do more than again refer to the extraordinary amount of industrial development in Bulawayo, and the rapid rate of the growth of your undertaking? (*Hear, hear*).

**Mr. Bradley:** Mr. President,—I should not like to let this opportunity pass without expressing my personal congratulations to Mr. Sibson for his admirable paper. Most of the points I would have touched on have been covered by previous speakers. But it is surprising and interesting to me to read the paragraph in the paper dealing with a survey of the possibility of getting block supplies of power from the Zambesi, or, alternatively, from the coal deposits at Wankie, supplying Bulawayo and presumably all intervening areas. This is a problem that probably will be tackled by the Rhodesian Electricity Supply Commission. While the Electricity Supply Commission in the Union does not necessarily supply the "hinterland," I may perhaps refer engineers in the various country districts to such a possible intention in a few years' time.

It is most gratifying to me to see such rapid and substantial progress in Bulawayo, and knowing the circumstances under which Mr. Sibson is and has recently been working and the effect on his health, I would like to convey my heartiest congratulations, hoping his health will speedily recover and that he will be able to continue with the good work he has so ably accomplished during the last few years. (*Hear, hear*).

**The President:** If there is no further discussion, I will now ask Mr. Sibson to reply.

**Mr. Sibson:** Mr. President,—I had expected that we should have had a longer discussion, and particularly I had hoped to have a round table debate on this cable box question. But unfortunately the engineer from one of the larger centres—I refer to Mr. Kinsman of Durban—is not present with us; I happen to know that he has had somewhat similar experiences as we have in Bulawayo, and I thought that my remarks would draw him out.

I think there have been very few points raised in discussion, Mr. President, that require a reply. Mr. Ferry of Cape Town raised certain points about the employment of single phase services. Mr. Wright gave one answer: if a fault occurs in the consumer's premises he can renew his own fuses or operate his own circuit breaker which, unless the fault is a serious one, he can do without any difficulty. On the other hand, if a fault takes place outside consumers' premises and supply on one phase has been interrupted in the section, it is questionable which offers the least annoyance—cutting off one-third of the consumers altogether, or cutting off all of them to the extent of one-third of their facilities. I think it is a psychological matter, and there is probably little to choose between the two disabilities: there would be as much trouble from the one source as from the other. Mr. Ferry does, I think, underestimate the difference in cost between single and three-phase services. I do not know if he is quoting pre-war figures when he speaks about the difference being only £4: I make it somewhere in the vicinity of £12, though, of course, our costs

are probably much higher in Rhodesia. If we instal circuit breakers, for example, there is one item alone which makes a big difference. The difference in cost of the meters, too, is now about £3 as between single and three-phase, to which must be added the overhead connection, service and pole cut-outs, cross-arms and so on, and after that there is also the cost to the consumer himself, which should not be ignored. As I say, it totals something in the vicinity of £12 in Bulawayo, which is a considerable item. I think that more or less deals with the points raised by Mr. Ferry.

Mr. Wright asked whether the circuit breakers employed are the single or double-break type. I cannot answer that, as we have only a few in circuit for experimental purposes. I have one in my own house, and that is a three-phase, three-pole switch, each phase with a single break. With regard to the trouble he refers to in connection with auto-reclose circuit breakers, this is entirely new to me. We have had all sorts of experiences and difficulties with auto-reclose circuit breakers, but nothing arising from dust.

In reply to Mr. Eastman, who mentioned the control of water-heating load to offset radiator peaks, this is a subject which I think has appeared frequently in the proceedings of this Association for many years past, and it would be very difficult for me to attempt to contribute anything further to what has already been said on this very important subject. Mr. Eastman is probably right when he attempts to set off the water-heating load against the radiator load. Of course one looks forward, in the future, to the better design of buildings and the greater use of air-conditioning, which would tend to reduce the incidence of high peaks by spreading heating loads over a considerable portion of the day, and perhaps other improvements of similar kind in respect of domestic appliances. But there is nothing I can say now that would add anything material to our deliberations on this subject.

**Communicated:** The remarks of Mr. J. C. Fraser of Johannesburg are appreciated, though I feel that it is possible to over-stress the desirability of providing a uniform plant in order to reduce the range of spares that is required. As he himself says, real efficiency is measured in terms of cost per unit sent out and it is not always good engineering to subordinate first costs to a desire for uniformity. However, it should be emphasised that the Bulawayo Station was not designed for anything like the total capacity which it now contains, and every extension since 1933 has involved, very largely, a study of the problem of pouring new wine into old bottles, and with the rate of new development increasing by leaps and bounds it was seldom possible to forecast the future with any accuracy. I would say that the new power station now being commenced is designed to accommodate, at first, two sets of 15,000 kw. capacity and then subsequent extensions up to a possible total of four more machines of 30,000 kw. each; while in the boiler house the first boiler installations will be units of 80,000 lbs. per hour rating, and all the subsequent boilers will be of double this capacity.

Mr. Fraser does modern engineers an injustice when he suggests that they are more interested in technical efficiency than in economics. The engineer of to-day is required to be as much of an economist as a technician, and I need hardly say, therefore, that the steam conditions

laid down for our future generating units were the subject of very careful analysis in respect of final cost per unit sent out.

Mr. Fraser draws atteniton to the increasing time lags which directional protection on a large scale involves, and this is quite a material point, as where a large number of sub-stations are required to be protected in a single ring main, the definite minimum time settings of the relays at the power station switchboard might rise to over two seconds. The existence of such a disadvantage is one of the things that requires to be weighed against the higher cost of pilot cable protection in some form or other, since a heavy surge lasting for a second or so can be a great source of annoyance to industrial consumers with large motors, which usually trip out on overload. As the author stated in the original paper, this system of protection would not be considered adequate for larger cities. I would state that the ring main switchgear in intermediate sub-stations is of the non-automatic type and does not, therefore, add to the time settings required.

With regard to the comments concerning loss of meters in thunderstorms, I think it is a practice in Johannesburg to supply all consumers by means of underground service cables from adjacent low tension overhead lines. Such a procedure, while expensive, must undoubtedly reduce the incidence of damage by lightning to any equipment on consumers' premises. As Mr. Fraser suggests, however, we have found certain types of meters more liable to damage than others and we have, it is believed, now found a meter which gives greater reliability than most of the other makes that we have employed.

## Cost of Proceedings

**The President:** The council this year wishes to make the printed copies of the *Proceedings* self-supporting because there was a loss of £120 last year. We shall probably have to increase the price to meet that loss, but the more copies that are ordered the cheaper, of course, they can be produced. So I hope you will do your best to buy as many copies as possible for your councils.

## Registration of Electrical Wiring Contractors

**The President:** There was one report which was not dealt with in Salisbury. That was the report of Mr. Fraser on the registration of electrical wiring contractors. Mr. Eastman will now open the discussion.

**Mr. Eastman:** The report contains a number of suggestions made in connection with the replies received by the original sub-committee to our questionnaire, and I personally feel that the board might, unless further information is given to it, be under a misapprehension as to the general wishes and intentions of our Association. As the replies have been submitted to the board without any comment by our Association on those points which are, in my opinion, highly controversial, I hope that instead of this Conference sending on to the board

this report in its present form, these controversial matters be referred to the sub-committee again for re-submission to those who are or who were responsible for making suggestions, to which perhaps objection might be taken that they are impracticable, so as to try to arrive at some amendment to the report which could be unanimously adopted. When unanimity has been reached, then the report should be sent on to the board, and I move to that effect.

**Mr. Fraser:** I have pleasure in seconding Mr. Eastman's proposal. I understand that copies of this report have already been circularised to all members, who are now required to analyse the proposals under the various questions, and submit any comments they wish to make to the secretary, who in turn, I take it, will notify the sub-committee which dealt with this questionnaire. You will notice that the only towns which replied were Cape Town, Port Elizabeth, East London, Durban, Pretoria and Johannesburg, so I assume the smaller municipalities are content to accept the decisions of the larger and, owing to the short time available, this may be the best way of handling the matter.

**Mr. Gripper:** May I ask the secretary whether the questionnaire referred to was sent to all municipalities. I may say that personally I have quite a flair for answering questionnaires, but I do not remember this one, and if it was not sent I would like to ask whether a copy is obtainable today, so that possibly a few moments may be spared for the matter tomorrow if it should be found that a number have not received them. Although Worcester is not yet in a determined area, we have provided for the registration of contractors and wiremen in our new local supply regulations.

**Mr. Downie** (Springs): As far as I am aware I did not receive this. We are rather worried about this licence question, and numerous questions have arisen in regard to the procedure which should be followed. I may add that it was our intention to adopt this method of licensing contractors, and I should like to know if circulars were sent to all members on the Reef.

**Mr. Leishman:** It should be explained that this questionnaire was compiled by the Wiremen's Board and not by the Association. Our secretary received a circular asking for the opinion of this Association, and the attempt was made to collate the replies of those who wrote individually to the board. As far as this Association is concerned it has not taken any responsibility of sending circulars out to all its members.

**Mr. Groome** (Roodepoort): We in Roodepoort have not licensed these men, and the result is that contractors from Johannesburg are allowed to carry out work in Roodepoort, while Roodepoort contractors are not allowed to carry out work in Johannesburg. If this goes on, each municipality will become a closed preserve for its own contractors.

**Mr. Eastman:** Did we not agree at the last conference that regulations dealing with the registration of electrical wiring contractors should be put into the Act, if it is reasonably practicable to do so? In Johannesburg the chairman of the board undertook to go into the matter. My motion is to the effect that the report submitted to this convention

dealing with the question of the registration of electrical wiring contractors be considered by members of our Association individually for such comments as they are able to offer, submitting them to the subcommittee of our Association dealing with the matter, and from them, of course, to the board, with a view to obtaining unanimity on the divergent opinions on certain aspects.

The motion was put and carried unanimously.

The convention adjourned until 2 p.m.

## TUESDAY, 22nd MAY, 1945

The Convention resumed at 2 p.m.

# Financial Statement

**The President:** In regard to the question of subscriptions, we have drawn up an estimated Revenue and Expenditure Account for the next 12 months, and I must say it does not look very bright. In fact, we are on the wrong side to the extent of about £200. Part of that deficit is made up by an anticipated loss on the *Proceedings*. As I mentioned yesterday, however, we do hope that this year we will be able to make the *Proceedings* self-supporting by getting more advertisements and by having more copies printed and sold.

But there is also a deficit on the general account. The executive council have given a great deal of attention to this matter, and they have now decided that we shall ask the municipalities to increase their subscription to this Association by 100%. That is to say that the scale laid down for the small councils will be £2 2s. 0d., the next on the scale will be £3 3s. 0d., and the largest councils who now pay £5 5s. 0d. will pay £10 10s. 0d. There may be some objections from the smaller councils, but I do not think there will be any from the larger ones. I do suggest, however, that the subscriptions are at the moment on the low side, and if we are to carry on this Association successfully it appers that we must increase them. In addition to the expenses that we have now it is proposed, but not yet finally decided, that in view of the large amount of work which the secretary has to do, we shall before long require a full-time secretary, and also have our own office and organisation, so that it will be necessary for the committee to have some funds in hand.

Therefore, I formally move from the chair that the subscriptions to this Association be increased 100% for the year commencing 1st September, 1945.

**Mr. Fraser:** I have much pleasure in seconding this motion. For the benefit of those councillor members who have not had an opportunity to study the financial statement, I would point out that the deficit shown for the year under review is approximately equal to the estimated revenue for the coming year. This deficit of £254 is, as explained by our president, mainly due to increased printing costs for the *Proceedings* of the last convention and to additional secretarial expenses. It will have to be met from the Association's reserve funds.

Hence it will be appreciated that the matter has become critical and, had there been time, the executive committee would have revised the scale of subscriptions. As a way out of the difficulty, therefore, I appeal to all members, engineer and councillor, attending this convention, to support the motion now before us whole-heartedly.

The motion was put and agreed to.

# Allocation of Plant to Municipalities

**The President:** Mr. Eastman has now received a telegram which he will read regarding heavy plant for municipalities.

**Mr. Eastman:** Mr. President,—During this conference I have been in touch with Mr. Hugo—my alternate on the Generation and Distribution Advisory Committee—on matters affecting certain undertakings in their applications for priority in the installation of plant, and I should like to bring up to date the information contained in the report which I submitted earlier in the proceedings, and which was compiled about a month ago. In passing I want to express my appreciation of the assistance given personally by the Controller of Building Materials in editing that report, so as to be able to include in it much that otherwise might have been considered secret information, and we are indebted to him also for the paragraphs which were included on the questions of prices and competition in regard to obtaining prices from tenderers overseas.

You will be aware from my report that the authorities in England had allocated to South Africa the manufacture of 186,000 kilowatt plant capacity for delivery in 1947, and of that amount 174,000 kilowatts had already been taken up by certain undertakings in this country before the Generation and Distribution Advisory Committee was established. That left a matter of 14,000 kilowatts to be taken up. Some of that has already been allocated through the Advisory Committee, but there was still, according to the best of my information in Cape Town, a matter of 2,600 kilowatts left of that 186,000 kilowatts for 1947. But circumstances in certain municipalities have changed to the extent that it is likely there will be an unexpectedly larger plant allocation still available for 1947. Thus there is a possibility of plant allocations being available for 1947, instead of, as was anticipated, from 1948 and onwards to 1950.

The position is now that when replies are received to the questionnaire issued to municipalities two months ago, and they have been considered from the standpoint of which of the requirements are most important in the interests of the country generally, it is possible that many of the stated requirements could be advanced from 1948-50 into 1947.

The committee would appreciate your assistance in this matter and I would ask you to let it have full information as to your requirements as soon as possible.

**Mr. Powell:** I should like to put one or two points. I have discussed certain aspects of this matter with Mr. Eastman privately, but there are so many factors arising out of these conversations that I think the matter will be of interest to members generally. In 1943 Bloemfontein made application to the overseas authorities for power station

plant, and they were turned down on the ground that the plant was not required as a contribution to the war effort. Without our knowledge, we were apparently put on the list of authorities requiring plant. Then I think about 1944 there was a public announcement in the Johannesburg *Star* which stated that 186,500 kilowatts of plant had been allocated to the Union. As soon as we read this we got into touch with the Controller of Building Materials, who is chairman of this committee, to ascertain the position. He did not advise us of any change of policy, but he said he would contact the High Commissioner and find out what was the actual position. After several months we had a reply from Mr. Borchenhagen in which he stated that he had received a communication from the High Commissioner stating that we had been allocated 7,500 kilowatts, and that we had been allocated to certain British manufacturers.

That was about four months ago. My particular worry is—what is the position in regard to this programme? Are we likely to lose our priority in the 1947 programme if we delay in placing our firm order? Might we be put back to the 1950 programme? In our case the Administrator will not permit us to put in a firm order until the price submitted by the overseas authorities has been approved by the Electricity Supply Commission.

**Mr. Eastman:** In reply to Mr. Powell, I can but say that so far as the committee is concerned that priority which was recommended still holds good, but if the Bloemfontein Municipality does not avail itself of that prioty in sufficient time, then I think it is probable that that municipality would be standing in the way of other undertakings obtaining plant which they require. I personally think that your municipality runs a very grave risk of losing its position and, therefore, I consider you should make up your minds quickly.

# General

## Railway Freights on Coal to Coast Ports

**The President:** I think Councillor Ferry has some remarks to make regarding the freight charges on coal to Cape Town.

**Councillor Ferry:** As I mentioned this morning, various items concerning railway freights have been and are being dealt with by such bodies as the Chambers of Commerce and Chambers of Industries, but nobody appears to be tackling the vital question of the freightage on coal from the colliery centres to the coastal ports, and other centres near the coast. This particularly affects Cape Town. The Cape Town City Council uses approximately 1,000 tons of coal per day. Until two months ago the railage was in the vicintiy of 17s. 6d. a ton, but now a surcharge of 10% has been added, and we do not know where it will stop.

It is true there are other alternatives we might consider, such for instance as getting our coal from Durban or elsewhere by ship. You can appreciate that this extra charge is costing us about £30,000 a year. In spite of that, however, we have not increased our tariff either to the railways or anybody else. We hope they will see eye to eye with us

in the long run, but I was wondering whether a resolution could be put to this convention. This matter could be left in the hands of a sub-committee of the executive and then Cape Town could be informed what this convention was doing in the matter.

**The President:** I do not know whether the convention considers that this is a matter which it could deal with at this rather late stage in the proceedings. It has been suggested that it is a matter which might be referred to a sub-committee of the executive to be dealt with. That was suggested at the council meeting this morning, and if this convention agrees to that procedure, of course it could be followed.

**Councillor Ferry:** We have a representative of the Railways here.

**Mr. Dalton:** This is obviously a matter which comes under the rates section, and I cannot, of course, enter into that sphere. But I do happen to know this in connection with a proposal to establish a power station at Touws River, that on the coal which leaves Beaufort West for the south, the Railway administration does not make anything at all; in fact there is a loss on the traffic from that point. And then, if I understand Mr. Ferry aright, he mentioned earlier in the proceedings that the Cape Town City Council had taken a million pounds from the electricity undertaking for the relief of rates, so they must be making something out of it. (*Laughter*).

**Mr. Bradley:** Being the only other delegate present from one of the main coastal areas, I rise to support Councillor Ferry, and feel sure that had my fellow councillor delegate been here he would heartily have supported Mr. Ferry's plea for reduced railage charges. I would not like the convention to think that this is the sole business of one or two municipalities, and that we should leave them to tackle the freightage question alone. The Port Elizabeth councillor representative would have supported Mr. Ferry very strongly if he had had the chance. We hope this convention will voice its protest to the burden these coal railage costs mean to power station operation in areas, perhaps long distances from the coal fields, but important in other national aspects.

**Councillor Eden:** A sub-committee could go into it from the point of view of the principle, that the rate imposed should be according to what the traffic can bear, with special reference to electricity undertakings.

**Mr. Gripper:** There is no doubt that power stations situated in our part of South Africa are entitled to further consideration in connection with Railway freight on coal, and I would add my support to the resolution being moved by the representative from Cape Town.

**The President:** The sub-committee will no doubt look into the matter in the broadest possible manner.

**Mr. Powell:** Allied with this is the question of freight on oil and petrol coming to inland centres from the coast. This surcharge is on all freights.

**The President:** "Fuel" instead of "coal" could be used in the terms of reference.

**Councillor Ferry:** As I pointed out, before other bodies are dealing with those things, such as the Cape Chambers of Commerce and Industries: they deal with practically everything except coal for power stations.

**Councillor Eden:** I think the 10% surcharge is really a Treasury levy—not a Railway levy. I speak subject to correction.

The motion was agreed to.

## GREETINGS FROM OTHER ORGANISATIONS

**The President:** You will remember that we received greetings from the S.A. Institute of Electrical Engineers through their representative Mr. Dalton, and from the Institution of Certificated Engineers through Mr. Fraser, but no replies have yet been made. Is it your wish that we send telegrams to both societies thanking them for their good wishes and trusting that the co-operation already existing will continue in the future?

Agreed.

# Minutes

**The President:** Members of the executive have been circulated with the minutes of yesterday's and to-day's council meetings. Is it agreed that I sign and confirm them?

Agreed.

The convention also expressed its thanks through Mr. Rettie, to Sir Henry Chapman, for the railway facilities and concessions provided for delegates.

**Mr. Dalton:** Mr. president,—There is just one point I would like to mention affecting the relationship between the South African Railways Administration and the Municipalities in the Union. As will be appreciated, the Railways are closely linked with them in various ways. We are big customers of theirs for current and sometimes they take power from us. I have handed you some notes which, owing to shortness of time, I fear I cannot read now. But I would be very pleased if you would be prepared to find room for them in your printed *Proceedings*. It would help to bring some important points to the notice of municipalities.

**The President:** I regret that we have not had time to deal with your notes, Mr. Dalton. I am afraid it was an oversight. But if you will agree, we will refer this matter to the executive council for suitable action. Would that meet with your wishes?

**Mr. Dalton:** Thank you very much.

**Mr. Ritson** (Stellenbosch): Mr. President,—I understand that one of our old friends is leaving us—one of the original members, although unfortunately he does not appear in the first photograph. I refer to Mr. Horrell, our secretary, who has put in some very hard work, especially of late, owing to the growth of our Association. Although he may relinquish the secretaryship, I sincerely trust that at futue conventions he will always be present. (*Hear, hear*).

**The President:** I endorse your remarks in the fullest measure, but I would explain that the reason why no official announcement has been made is because Mr. Horrell has not yet finally decided to resign from the secretaryship. We do all sincerely appreciate the very hard work done by him, and the difficulty he is now experiencing in carrying on with two jobs.

**Mr. Horrell:** I thank you for your remarks and endorsement, Mr. President.

**Mr. Powell:** And now, Mr. President, as these proceedings draw to a close, it gives me great pleasure speaking on behalf of the engineer members present, to express our deep and sincere thanks to you, Mr. president, to the Mayor and City Council of Bulawayo, and to all those concerned with the admirable arrangements made for our comfort and pleasure at this conference, and when I say this I do not overlook those workers behind the scenes—Mr. Phillips' staff, and a Mrs. Hardy to whom I think a special tribute is due. (*Hear, hear*).

I think that not the least interesting aspect of this conference has been the *esprit de corps* which has been noticeable between all the engineer members and the councillors. Personally I have met many good friends at this conference, whom I trust will remain my friends in the future. All I can say is that I hope I shall have the renewed pleasure of meeting all you gentlemen at our next conference in Bloemfontein. (*Applause*).

**Councillor Pritchard:** Mr. President,—May I, on behalf of the Councillor delegates, express our humble feelings to you and to your executive on the wonderful manner in which they have organised not only the entertainment but the really constructive work which has been carried out at this conference.

I am fully aware of the disadvantage resulting from the absence from this convention of my engineer colleague, Mr. Kinsman, who to his and your regret has been so unfortunately prevented from being amongst you, but it is gratifying to observe that he is so highly esteemed as an illuminating star in your Association. (*Hear, hear*). I take this opportunity of thanking your executive for honouring him by popular ballot to a position on your executive, which I am sure he will be pleased to hear. I also take this opportunity on behalf of the Durban City Council to thank you for the honour which you have bestowed on their engineer.

Like previous speakers, I feel bound to comment on the general air of friendliness which has prevailed amongst delegates from all parts of South Africa during this conference. Those who contributed to the discussion deserve, I think, a real vote of thanks. They put forward their ideas very effectively, and by doing so they have strengthened the cable which extends throughout the circumference of South Africa and Rhodesia, and which has meant such a lot to this conference, not only electrically but personally.

In conclusion I should like to say—and I am sure my fellow councillors will join with me—that we wish you and your Association the best of luck in its future activities, and I need hardly add that you will receive all the co-operation you expect from the councillor members. (*Applause*).

**Mr. Pringle:** As one of the "hangers-on," may I endorse what the previous speakers have said, Mr. President: We all very much appreciate what has been done.

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