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## REPORT OF THE SEMINAR ON NEW METALS AND MINERALS (Addis Ababa, 5-10 February 1968)

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## REPORT OF THE SEMINAR

### Seminar

1. The Seminar on New Metals and Minerals was convened at Africa Hall, Addis Ababa, from 5-10 February 1968. It was attended by experts from ten member States of ECA, and by four consultants invited from developed countries. An eleventh member State of ECA accepted an invitation to the Seminar and submitted a paper in advance but at the last moment was unable to be represented. Observers from various organizations also attended. The list of those in attendance is given in Annex I to this report.

2. Mr. G.E.A. Lardner, Director, Natural Resources and Transport Division, ECA, delivered the opening address on behalf of the Executive Secretary. A copy of the text is given in document E/CN.14/MIN/12.

### Origin and Purpose of Seminar

3. The Seminar was organized by ECA in implementation of Project 53 in its Work Programme for the biennium 1967-1968, approved by the Commission at its Eighth Session at Lagos in February 1967. The object of the Seminar was to familiarize senior personnel of African Governments engaged in mineral resource development with the impact of technological changes in advanced countries on the demand for new or rare metals and minerals, their occurrences, exploration and evaluation; treatment, extraction and purification; technological developments and their applications and uses in industry.

### Daily Programme of Work

4. The daily programme of work of the Seminar consisted of the presentation of country papers by each of the participants, and of papers by each of the consultants on selected topics related to the geology, extraction

and purification, technology and uses, and marketing of the new metals and minerals. Discussion of each paper followed its presentation. The observer from U.N. Headquarters made a statement on the types of rare metal deposits in Africa. A closing session reviewed the Seminar as a whole and approved the suggestions appearing in this final report. A copy of the Daily Programme of Work is given in Annex II. A list of papers submitted to the Seminar is given in Annex III.

#### Evaluation of Seminar Results

5. It was the consensus of those participating in the Seminar that the exchanges of information and experience to which it gave rise were valuable for all participants. The following specific suggestions were agreed upon:

- (a) That plans should be made for mineral research centres to be established in Africa with well-equipped and well-staffed laboratories and ore-dressing and other facilities, capable of performing all necessary mineral analyses and carrying out research on problems of the African mineral industries. Such research centres would be desirable in each of the four African sub-regions but it would be wise to begin with the establishment of such a centre in one sub-region, which might serve as a model and example for other sub-regions.
- (b) That studies and plans be undertaken for strengthening existing facilities in universities on a regional and/or sub-regional basis in the fields of the earth sciences and mining, and plans be made for the establishment of in-service training centres at post-graduate levels for the exploration and development of African mineral resources.

- (c) That member States of ECA should examine the possibility of increasing the services of sub-professional personnel with a view to improving the productivity of their professional staff, and towards this end it is recommended that they take appropriate steps to promote the training of sub-professional personnel for service in the public and private sectors.
- (d) That member States of ECA should be encouraged to exchange geologists, mining engineers, and technical personnel having experience in special fields, assigning them for specified periods to serve with the geological services of other countries of the region needing their specific experience. In order to facilitate such exchanges, a list of experienced personnel in the service of African countries, with an indication of their experience and specialities, should be prepared and circulated to member States.
- (e) That, in general, the latest geochemical and geophysical and other methods be used to explore for new deposits.
- (f) That in view of the present short supply of tantalum, African countries should intensify their exploration of columbite-bearing granites and pegmatites, and that every possible assistance should be given them in this endeavour.
- (g) That abandoned deposits be resurveyed with the latest techniques in order to appraise their potentialities more accurately.
- (h) That particular attention be directed to small viable deposits workable by small miners but too small to interest large firms, and that geological and mining advice be made available to small miners through the establishment of local offices in the center of the mining field.

- (i) That ECA should investigate the prospects of obtaining financial support from UNDP or other sources for research on the ore-dressing of economic minerals associated with African carbonatites, such as pyrochlore, rare earths, etc.
- (j) That ECA should endeavour to collect and distribute to African countries information on deposits of these minerals elsewhere and on the processes used there for beneficiation.
- (k) That a study be made of the various processes listed in Dr. Fedorov's paper to ascertain to what stage the processing of the new metals and minerals can be carried out in African countries themselves. Each of the new metals and minerals should be studied separately, as the relevant factors differ in each case.
- (l) That an effort should be made to provide interested African member States with up-to-date market information concerning the potentialities and outlook for the new metals and minerals.
- (m) That ECA prepare summaries of available information concerning the new metal and mineral resources of, and production by, African member States not participating in this Seminar, in order to complete the picture presented in the Seminar.
- (n) That the papers submitted to this Seminar, including ECA's summary mentioned above, be published as a U.N. document for general distribution.

## ANNEX I

### LIST OF PARTICIPANTS

#### PARTICIPANTS

- |  |   |
|--|---|
| 1. Congo (Republic of)                           | M. M.D. Mayanda, Géologue, Bureau Minier Congolais                                |
| 2. Congo (Democratic Republic of)                | M. B. Daboula Moke, Géologue, Service Géologique d'Etat                           |
| 3. Ivory Coast - Côte-d'Ivoire                   | M. Joseph N'zi, Directeur des Mines et de la Géologie                             |
| 4. Kenya   | Professor I.S. Loupekine, Professor of Geology, University College, Nairobi       |
| 5. Malagasy - République Malgache                | M. Jean A. Safimahova, Directeur des Mines et de l'Energie                        |
| 6. Morocco - Maroc                               | M. O. El Ghazi, Chef du Service régional de la Géologie - Oudja                   |
| 7. Nigeria                                       | Mr. E.A. Ifaturoti, Chief Inspector of Mines, Ministry of Mines and Power         |
| 8. Sierra Leone                                  | Mr. D.J.S. Fraser, Director of Mines  |
| 9. Uganda  | Mr. H.G. Plummer, Principal Geologist, Geological Survey and Mines Department     |
| 10. United Arab Republic - République arabe unie | Mr. Osman M. Mahgoub, Director General, Geological Survey and Mining Organization |

#### CONSULTANTS

- |                   |  |
|-------------------|--|
| 1. France         | M. Soule de Lafont, Chef du Service géologique de la Société Pechiney St. Gobain |
| 2. United Kingdom | Mr. J.W. Pallister, Overseas Division of the Institute of Geological Sciences    |

CONSULTANTS (continued)

3. U.S.S.R.

Dr. T.F. Fedorov, Senior Research  
Officer, Institute of Metallurgy,  
Academy of Sciences, Moscow

4. U.S.A.

Professor Karl A. Gschneidner, Jr.  
Professor of Metallurgy and Director  
of Rare Earth Information Center,  
Iowa State University, Ames, Iowa

OBSERVERS

1. Ethiopia

Ato Zaude Bessoufecad, Assistant  
Minister, Ministry of Mines

Ato Izaddin Ali, Director-General,  
Ministry of Mines and Project Co-  
Manager, U.N. Minerals Survey

Mr. Danilo Jelenc, Adviser, Ministry  
of Planning

Prof. R.O. Whipple, Assistant Dean,  
Chemistry Dept., H.S.I. University

Mr. P.B. Jones, Geology Department,  
H.S.I. University

Mr. W.A. Padgham, Assistant Professor,  
Geology Dept., H.S.I. University

Mr. J.L. Gibson, Geology Department,  
H.S.I. University

Prof. E. Schiffjsma, Head of the Dept.  
of Geology, H.S.I. University

Mr. L.R. Pittwell, Associate Professor,  
Chemistry Dept., H.S.I. University

Mr. Alexei A. Beus, U.N. Special  
Technical Adviser, Natural Resources  
and Transport Department

Dr. P. Martin-Kaye, Project Manager,  
U.N. Minerals Survey

Mr. G.R. Kent, Geologist, U.N.  
Minerals Survey

2. United Nations, New York

3. UNDP, Ethiopia

OBSERVERS (continued)

4. France M. Gabriel Durand, Ingénieur, Service  
de Recherches, Pechiney St. Gobain

ECA SECRETARIAT

1. Mr. G.E.A. Lardner, Director, Natural Resources and Transport Division
2. Dr. N.M. Shukri, Regional Adviser on Mining Geology
3. Mr. Stephen C. Brown, Mineral Economist

ANNEX II

DAILY PROGRAMME OF WORK

5 February 1968

4:00 P.M.

Opening Speech

6 February 1968

Morning:

Country papers of:

Congo (Republic of)  
Congo (Democratic Republic of)  
Ivory Coast

Afternoon:

Kenya  
Malagasy  
Morocco

7 February 1968

Morning:

Country papers of:

Nigeria  
Sierra Leone  
Uganda

Afternoon:

U.A.R.  
Consultant (U.K.) "The Outlook for  
Pyrochlore Concentrates"  
UN Headquarters observer, "Types  
of Rare Metal Deposits in Africa"

8 February 1968

Morning:

Consultant (U.K.) "Aspects of Work of  
British Government Institutions  
in the Evaluation of the Newer  
Metals"  
Consultant (USSR) "Isolation of Some  
Rare Metals"  
"Some Methods of Obtaining Niobium  
and Tantalum and Their Usage"

8 February 1968 (continued)

Afternoon:

Consultant (USA) "Technology and Uses  
of Beryllium, Cesium, Germanium,  
Hafnium, Niobium (Columbium), Rare  
Earths (Including Yttrium and Scandium),  
Tantalum, Titanium and Zirconium"

Consultant (France) "Beryllium, Cesium,  
Columbium, Germanium, Hafnium,  
Rare Earths, Tantalum, Titanium,  
Yttrium, Zirconium - Production,  
Demand and Commercial Outlook"

9 February 1968

General discussion and approval of suggestions.

Closing speech: Mr. G.E.A. Lardner, Director, Natural Resources and  
Transport Division, ECA

10 February 1968

Field trip to Rift Valley of Ethiopia.

ANNEX III

LIST OF DOCUMENTS ISSUED

<u>Symbol</u>	<u>Title</u>
E/CN.14/MIN/1	General Information on Certain Minerals Whose Utilization is Growing or Tending to Grow (submitted by the Government of Rwanda)
E/CN.14/MIN/2	The Present Situation with Respect to the New Metals and Minerals (submitted by the Government of the United Arab Republic)
E/CN.14/MIN/3	Niobium, Rare Earths and Beryllium in Morocco (submitted by the Government of Morocco)
E/CN.14/MIN/4	Beryllium, Columbium, Rare Earths, Tantalum, Titanium, Yttrium and Zirconium in Uganda (submitted by the Government of Uganda)
E/CN.14/MIN/5	Nigeria's Potential for the Production of the New Metals and Minerals (submitted by the Government of Nigeria)
E/CN.14/MIN/6	Titanium Minerals in Sierra Leone (submitted by the Government of Sierra Leone)
E/CN.14/MIN/7	New Minerals in the Ivory Coast (submitted by the Government of the Ivory Coast)
E/CN.14/MIN/8	Technology and Uses of Beryllium, Cesium, Germanium, Hafnium, Niobium (Columbium), Rare Earths (Including Yttrium and Scandium), Tantalum, Titanium and Zirconium (by Karl A. Gschneidner, Jr.)
E/CN.14/MIN/9	Status of Development of Certain New Metals and Minerals in Kenya (submitted by the Government of Kenya)
E/CN.14/MIN/10	Some Methods of Obtaining Niobium and Tantalum and Their Usage (by O.P. Kolchin)

<u>Symbol</u>	<u>Title</u>
E/CN.14/MIN/11	Isolation of Some Rare Metals (by T.F. Fedorov)
E/CN.14/MIN/12	Opening Speech by Mr. G.E.A. Lardner, Director, Natural Resources and Transport Division, ECA Secretariat
E/CN.14/MIN/13	The "Rare Minerals" of the Democratic Republic of the Congo (submitted by the Government of the Democratic Republic of the Congo)
E/CN.14/MIN/14	Documentary Summary of the Country's Situation with Respect to Beryllium, Cesium, Columbium, Germanium, Hafnium, Rare Earths, Tantalum, Titanium, Yttrium and Zirconium (submitted by the Government of the Republic of the Congo)
E/CN.14/MIN/15	Note on the New Metals and Minerals in Madagascar (submitted by the Government of the Malagasy Republic)
E/CN.14/MIN/16	Aspects of Work of British Government Institutions in the Evaluation of the Newer Metals (by K. Bloom- field)
E/CN.14/MIN/17	The Outlook for Pyrochlore Concentrates: A Review (by D. Slater)
E/CN.14/MIN/18	Beryllium, Cesium, Columbium, Germanium, Hafnium, Rare Earths, Tantalum, Titanium, Yttrium, Zirconium: Production, Demand and Commercial Outlook (by D. Soule de Lafont)
E/CN.14/MIN/19	Types of Rare Metals Deposits in Africa and Main Directions in Exploration (by Alexei A. Beus)