LETTERS OF THE WORKING GROUP ON MANGANESE FORMATION OF INTERNATIONAL ASSOCIATION ON THE GENESIS OF ORE DEPOSITS

REPORT

ON THE STATUTORY MEETING OF THE WORKING GROUP ON MANGANESE FORMATION HELD ON 31 AUGUST 1970 IN KYOTO, DURING THE IMA–IAGOD MEETINGS '70

Participants of the Statutory Meeting:

DR. MICHAEL FLEISCHER (USA), PROF. DR. GY. GRASSELLY (Hungary), Provisional President of the Working Group, PROF. DR. H. HARDER (German Federative Republic), DR. A. KATO (Japan), DR. G. KAUTSKY (Sweden), Councilor of the IAGOD, PROF. DR. S. J. KIM (South Korea), PROF. DR. K. KRAUSKOPF (USA), PROF. DR. C. NAGANNA (India), PROF. DR. M. NAMBU (Japan), PROF. DR. M. VANEČEK (ČSSR), Secretary General of the IAGOD, DR. I. M. VARENTSOV (USSR), Provisional Secretary of the Working Group.

PROF. DR. GY. GRASSELLY, *Chairman:*

Gentlemen, Members of the Working Group,

First of all I should like to greet you all as the Provisional President of the Working Group on Manganese Formation. At the same time I should like to express my sincerest convinction that our work will prove to be fruitful not only as regards the present Statutory Meeting but in the future, too. I am sure of this since all of you, having taken part in the work of the Working Group, or willing to participate in the future, share a common interest in the problem of formation of manganese ore deposits and in the long series of geological, mineralogical and geochemical issues concerning the main question. And I may add to all this the numerous questions in the field of experimental methods and their application.

I am sure that we shall work together in a very useful way and this common striving will bring its results.

Please, take an active part in the activity of our Working Group. Hereby I open our Statutory Meeting.

DR. I. M. VARENTSOV, *Provisional Secretary:*

Mr. President, Members of the Working Group,

Let me express on behalf of the Soviet geologists, studying manganese ores, the deep gratification in connection with the organisation of Working Group on Manganese Formation. It refers as well to the Organising Committee

of the 7th Session of IMA—IAGOD, that gives us the necessary facilities to hold the meetings of this Working Group. Thus we are most thankful to the organisers of the 7th Session of IMA—IAGOD namely the Chairman of Organising Committee PROF. DR. T. WATANABE, General Secretary DR. I. SUNAGAWA, Chairman of Programme Committee PROF. DR. P. SADANAGA and our Japanese colleagues co-chairing the meetings of the Manganese Group — PROF. DR. M. NAMBU and DR. A. KATO.

To this audience there is no necessity to stress on the importance of researches of various aspects of geology, mineralogy and geochemistry of manganese ores. Instead of this I would like to point out some aspects of the activity of WGMF.

The main points of the future activity of WGMF are shown in the Provisional Programme, which we are going to discuss, try to improve, and accept if you have no serious objections. Now it seems rather reasonable to stress the PRELIMINARY character of this Programme and the need to make corrections. Certainly, we take into consideration all the remarks received by PROF. DR. GY. GRASSELLY and by me for the year gone. And these amendments should contain the results of tonight's discussion.

However, some problems I think, are rather essential and let me draw your attention to them.

Manganese ores today may be regarded as well studied, in comparison with ores of other metals. However, there are some serious problems which have been tackled for the last 20—30 years in a very limited way. On the other hand, the advances in solving some geological and geochemical problems have been followed by new more complicated ones, which may be solved by applying the recent achievments of science and technology.

These problems may be divided into two groups:

a) Structural-Geological,

b) Mineralogical-Geochemical.

In manganese geology we are still seriously interested in the problems of structural, formational and facies control of localization of manganese deposits. Their relation to certain stages in the development of structural regions are worthy of investigation. The volcano-sedimentary Mn deposits are of special interest. I mean, their localization formational development in the general magmatic history of the region. However, in the last few years some works, concerning narrow, regional subjects have been published. But unfortunately the problem of manganese-bearing jaspilite formations were still out of attention of research-geologists. The prominence of this problem is obvious — this is an example to study the relation of manganese — and iron — ore forming processes in Precambrian.

In manganese mineralogy of recent times there has been no essential progress. There are lots of uncertain points in the matter of characterisation and systematization of information on manganese oxide minerals. It is not evident for me why the systematical publications on manganese oxide minerals that were so successfully carried out by American authors in the forties and fifties is now discontinued. Now in spite of the great number of papers, a compiled work is not published, which summarizes all the information on manganese especially oxides, compounds and their structures. Let me explain it by an example. We don't know as a matter of fact what is BIRNESSIT, the mineral whose abundance may be compared in certain sense with quartz.

In the problems of manganese geochemistry, probably, the fundamental features of ore formation of this element are focussed. Unfortunately, for the last 30 years, since V. I. VERNADSKIY put on several problems, we have not done much. Despite the evident biogenic role of manganese in the upper part of the lithosphere and hydrosphere, we still have no concrete information on these questions. I will give you only two examples: still there are not works showing the role of Mn-oxidizing, -reducing microorganisms, and the mechanism of this process. In waters of recent basins where colossal amounts of manganese and associated elements are accumulated, the form of presence of this element is not still known. Certainly the problem of the chelate-like compounds, the components of proteins, amino-acids, as the probable form of Mn in sea water are still waiting to be solved.

The explorer studying the geochemistry of manganese tries to find out the past processes on the ground of ancient, altered products. This task may be better solved, dealing with the modern processes of manganese ore formation in lakes, seas, oceans and in thermal springs of volcanic zones, because we can perform the direct measurements of the characteristics of this events.

The investigations of the kinetics and mechanism of manganese ore formation processes are of no less significance.

I may point out three approaches to solve this very complicated problem — study of manganese ore formation process.

a) Theoretical, calculated one, based on thermodynamical characteristics, which adequately correspond to natural processes.

b) The method of experiments, modelling the processes or of some of their stages.

c) Direct observation of modern natural process, measuring all the available characteristics.

I restrict myself only to some parts of the problems, that seems to me essential. Of course there are much more.

Looking for an approach to solve these problems PROF. GY. GRASSELLY and I have drawn up this programme. I hope it is obvious, that along with the exchanges of current results — I mean regular meetings of WGMF and preparing the 2nd International Symposium on Manganese Ores, it is necessary to summarize the results of investigations already accomplished. I concern the preparation of materials for an International Monograph on Manganese Ores. Finally, it would be good to have similar views on some features of composition and texture of manganese ores and minerals. For this purpose it is reasonable to arrange the wide exchange of standard collections.

My Soviet colleagues supported this Programme. Many of them would like to take part in carrying out some sections of it. We clearly understand all the difficulties, that might arise on the way of its realization. However, the problems of investigation of manganese ores, I believe, are so significant that they deserve any expenses of our force, energy, and time.

The path of scientific progress has always been paved at the expense of uneasy efforts. I am sure, by following the programme I have proposed, in a short time, more explorers can take part in solving these problems and their research contacts will be more closer.

PROF. DR. GYULA GRASSELLY, *Chairman:*

Gentlemen,

Now turning to the discussion of items of the Programme of the Statutory Meeting having been sent to each national representative in due time, the first question is the *necessity and possibility of organizing the 2nd International Symposium on Manganese.*

At first sight it appeared likely to try to organize it during the 24th International Geological Congress in Montreal, Canada, and this idea has been embodied in the Provisional Programme published in Acta Mineralogica-Petrographica Universitatis Szegediensis Tom. XIX/1, in 1969. Since, however, our Working Group has just been formed, the question arises, whether we have strength and what is more, time, to organize in 1972 (and regarding the deadline of submitting papers even earlier) a real international symposium with a wide range, depth and on a level that would prove to be a good continuation of the symposium held during the International Geological Congress in Mexiko. This problem has been touched by our colleagues in the U. S. A. and in agreement wit them I see the following possibilities:

a) Our WG could hold a Scientific Session during the 24th International Geological Congress, for which even the colleagues in the USA can submit several lectures — since due to the short time they could not actively participate in the present session.

b) Regarding the results of the present Statutory Meeting and Scientific Session consider the proposals of our American colleagues to organize a really world-wide Second International Symposium on Manganese during the 25th International Geological Congress.

c) If you agree with the above two possibilities, we shall ask the IAGOD Council to arrange with the Organizing Committee of the 24th International Geological Congress (MR. JOHN E. ARMSTRONG, Secretary General, 601 Booth Street, Ottawa, Canada) to secure place and time for the Second Scientific Session of our Working Group, and we must encounter what topics and how many lectures from the different countries could be expected for this session, so that the Secretary General of the Organizing Committee of the Congress could be informed of that in due time. Moreover, we must ask the IAGOD Council to pass a decision concerning our proposal under *b)* and give help for its realization.

Resolution: The proposal on organizing the Second International Symposium on Manganese was discussed and the members decided that during the 24th International Geological Congress in Montreal a Scientific Meeting of the Working Group on Manganese Formation is to be held with about 20 lectures concerning the different fields of manganese researches and the Second International Symposium on Manganese could be planned from now and may be held during the 25th International Geological Congress. National representatives are requested to submit the titles of their and their compatriots' lectures to be read at the scientific session during the Geological Congress in Montreal as soon as possible, to the address of MR. JOHN E. ARMSTRONG (see above).

The next item of our programme: *providing a systematic information on the activity of the Working Group.*

I think that regular information on the activity of the Working Group and at least annual reviews of the most important results in manganese ore researches reached in different countries would be very useful. In this respect I would suggest the following. The Institute of Mineralogy, Geochemistry and Petrography of the University of Szeged (Hungary) has an annual publication — *Acta Mineralogica-Petrographica* —. The language of publications is English and the topics are mineralogy, geochemistry and petrography, geology. In the course of the twenty five years of its publication this Acta has become fairly well known all over the world and the papers published in it are regularly reviewed by the Chemical Abstract, the Mineralogical Magazine and by the Zentralblatt für Mineralogie.

The Acta Mineralogica-Petrographica so far has not been on a commercial basis: we are sending it to institutions and even to single persons on an exchange basis. For information I mention that 300 copies are sent to different countries among them 30—30 copies to the German Federative Republic, the Soviet Union and the United States etc.

As the Editor of this Acta Mineralogica-Petrographica I am ready to publish annual reviews written by the respective national representatives summarizing the more important results in manganese ore researches in their own countries. Of course, your papers sent for publication in our Acta are welcomed as well.

It is my duty, however, to inform you that MR. DORR, national representative of the USA informed me on the opinion that this Acta is not known well enough in the States or e. g. in Africa to fulfill this duty — namely to be a source of information for people interested in manganese ore researches. They think that either *Economic Geology* or *Mineralium Deposita* or *Geochimica et Cosmochimica Acta* would be more suitable for this. I can but agree with them in this respect, since it is obvious that a university publication cannot compete in volume, number of copies, etc. with these international journals.

To decide the problem of solving the question of information — either Acta Mineralogica would be the organ, as suggested by me, or to accept Mr. Dorr's suggestion — is now your task. On my part I should mention that if the national representatives supply me with the list of institutions, where they think our Acta is necessary to be sent, I can promise that in due time they will receive it.

I should also like to emphasize that Acta Mineralogica would publish first of all reviews of results of researches in particular countries written by the questioned national representatives themselves.

Resolution: The question of accepting a journal as a semi-official organ of the Working Group on Manganese Formation was discussed in details, and decided to request the University of Szeged (Hungary) to permit to have the Acta Mineralogica-Petrographica as semi-official publication of the Working Group. PROFESSOR GY. GRASSELLY, Editor of Acta Mineralogica-Petrographica assured the Working Group on behalf of the University to make available 20—25 pages in the Acta for the use of the Working Group.

I believe that you agree with the next item on our agenda: I think it would be very reasonable to make an *exchange of samples of typical standards of manganese ore deposits* from the more important mines of different countries. If such a demand really exists, I am convinced it could be met with the help of the national representatives.

> **Resolution:** The question of exchange of standard minerals and ore samples was discussed and decided to request all national representatives to undertake an active role in the future in order to realize this aim. To this end all the national representatives will receive a list of the names and addresses of those having already taken part in this work, and any further information can be obtained by the respective national representative. As a matter of fact, the exchange of standard minerals and ore samples lays on the basis of mutuality.

As a farther and further aim, we can concentrate our efforts on compiling by an international panel of experts a *monography*, where — following the suggestions given by you and the national representatives — the chapters are written by the most competent researchers or research-groups. I know that at the present time our Working Group is not strong enough to start such an enormous work in the hope of success and up to a very short deadline, but I think that to consider this suggestion is not early even today. If you are of the opinion that a monography as outlined in the Provisional Programme is really necessary, as a first step, we can start upon forming the list of topics touched upon there and to form the personnel of the Editorial Board. This is a problem to be undertaken only by a wide circle of experts, naturally asking for the opinion of our colleagues, who are interested is manganese ore researches, but could not participate in the present session.

> **Resolution:** National representatives are requested that taking into consideration remarks of researchers working in their respective countries, they draw up a proposal on the tematics of the mentioned monography chapter by chapter and furthermore to suggest names of desired authors for the particular chapters. They are further requested to submit these suggestions in 1971 to the President or Secretary of WGMF so that all the national representatives could receive them in mimeographed form. Suggestions will be discussed and work started during the Business Meeting to be held at the time of the 24th International Geological Congress in Montreal.

And concerning the last point of our Provisional Programme, I think, *we must strive to include into the activity of our group all those interested in manganese ore researches, experienced scientists as well as promising young researchers.* If we could gather all people interested in this very wide and manyfold field and could inform our members regularly on the activity and aims and results of the Working Group, this would promote a closer connection, exchange of ideas and publications and materials, too. Moreover, if as it has been proposed, we shall be able to give a detailed information regularly, of the newest scientific results attained in different countries, this means a considerable step forward in performing the aims of our Working Group.

Of course, the bulk of work will be done in all this by the national representatives of the participating countries.

As a result of last year's correspondence up to this time the following countries are represented in the activity of the Working Group: Bulgaria, Czechoslovakia, Hungary, India, Jugoslavia, the Soviet Union, the United States of America. I should like to express my sincerest gratitude from here as well to the national representatives of India, the Soviet Union and the United States, namely to DR. SUPRIYA ROY, DR. IGOR M. VARENTSOV and DR. JOHN VAN N. DORR for their helpful assistance, owing to what our work could at all be started, and also to thank our Japanese friends for their excellent and careful work done in organizing our meeting. It is their merit that we can sit here, holding our Statutory Meeting and first Scientific Session.

Names of *national representatives* participating in our work can be found in the last issue of Acta Mineralogica-Petrographica (1969). Considering recent correspondence and personal exchanges of views, I would ask you, Gentlemen, to reinforce these national representatives and accept the following names for this office:

United Arab Republic: PROF. DR. E. M. EL SHAZLY (Cairo, Egypt);

South Korea: PROF. DR. SOO JIN KIM (Seoul, Korea);

Japan: PROF. DR. MATSUO NAMBU (Sendai, Japan);

Roumania: PROF. DR. R. DIMITRESCU (Bucureşti, Roumania).

The Geological Institute of Marocco expressed an interest in the work, although no name of a national representative was proposed from there. The representation of the Federative German Republic will soon be arranged by correspondence.

> **Resolution:** The Working Group accepts the proposals and wishes success to the former and newly elected representatives in their work for the purposes of the Working Group. National Representatives are requested to fill in an Application Form for Membership and send it to the Organizing Secretary (PROF. DR. P. ZUFFARDI, Cagliari, Sardinia, Italy) of the International Association on the Genesis of Ore Deposit — in the case if they are not members yet.

Now I ask PROFESSOR M. VANEČEK, Secretary General of IAGOD, to put forward the proposal of the Council of the IAGOD to elect the new officials of the Working Group for the next four-year period.

PROFESSOR M. VANEČEK, *Secretary General of the IAGOD:*

Mr. Chairman, Members of the Working Group,

I have been honored with the task to interpret to you the proposals of the IAGOD Council: to elect for the next four-year period PROF. DR. GY. GRASSELLY (Hungary) President of the Working Group, PROF. DR. C. NAGANNA (India) and DR. JOHN VAN N. DORR (USA) Vice-Presidents; DR. I. M. VARENTSOV (USSR) Secretary. At the same time on behalf of the IAGOD Council I wish you success in your future work and I express my best personal wishes as well.

Resolution: The Working Group accepts the IAGOD Council's proposals and unequivocally elects the following officers:

President: PROF. DR. GY. GRASSELLY (Táncsics M. u. 2., Szeged, Hungary)
Vice-Presidents: PROF. DR. C. NAGANNA (Dept. of Geology, Bangalore University, Bangalore–1, India)
DR. JOHN VAN N. DORR II, (US Geol. Survey, Building 10, Washington, D. C. 20 242)
Secretary: DR. IGOR M. VARENTSOV (Pyzhevskiy Pereulok 7, Moscow, Zh–17, USSR).

PROF. DR. GY. GRASSELLY, *President of the Working Group:*

Gentlemen, Members of the WGMF,

Permit me in the name of the newly elected officials to express my sincerest gratitude for your kind support and promise our willingness to serve and promote the work of our Working Group in the future according to our best knowledge. Thank you for your participation and for the many useful suggestions. I will inform the IAGOD Council about what has been done here and all the resolutions. I wish you good work and results in the future. I close this Statutory Meeting.

DR. I. M. VARENTSOV,
Secretary of the Working Group
on Manganese Formation of the IAGOD
Pyzhevskiy pereulok 7, Moscow Zh—17,
USSR

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