SYMPOSIUM ON APPLIED GEOLOGY IN THE NEAR EAST

Ankara, 1955

The Symposium on Applied Geology in the Near East organised jointly by UNESCO Middle East Science Cooperation Office and the Mining Research and Exploration Institue of Turkey was held in Ankara on November 14th-17th 1955. This Symposium constitutes the second international convention which took place in Turkey on geological subjects, the first one being the Symposium on Arid Regions in 1952.

This convention which was held with the participation of elite scientists and Administrators of the Near East from countries apart from Turkey, such as Cyprus, Egypt, Irak, Iran, Lebanon, Sudan, Syria, Transjordan and such interested countries as Prance, Italy, Spain and Yougoslavia, has given a chance to every one of these worthy specialists to serve the science of geology in general and more particularly to serve these countries by presenting the results they have obtained from researches made in the field of Applied Geology in their respective countries, by comparing these results, and finally by drawing the necessary conclusions from these discussions.

His Excellency Samet Ağaoğlu, the Minister of State Enterprises, inaugurated the Symposium by the following address which he delivered in the Auditorium of the Dil-Tarih ve Coğrafya Fakültesi (University) in Ankara at 10 a.m., Monday, November 14th, 1955, before the delegates and a select audience: "I adjas and Cantleman

"Ladies and Gentlemen,

I am indeed very happy to have the opportunity to preside on behalf of the Turkish Government, the inaugural session of this "Symposium on Applied Geology in the Near East'¹ organised jointly by the UNESCO Middle East Science Cooperation office and the M. T. A. (Mineral Research and Exploration Institute of Turkey) as a result of the ppinmon desire for a closer intsrnational cooperation in the field of geplogy. I welcome each and every one of you.

I see no need to dwell upon the importance of effects and benefits of science on the happiness and prosperity of contemporary society, before such distinguished representatives of science and technology.

I should like to point ^out that close cooperation in scientific and technical research is an inescapable necessity for the physical and spiritual development of the nations. It can be said that science and technology are constantly bringing the nations of the world to a common destiny. To-day the home of science is the world itself, and the objectives such as common progress of mankind toward civilization, its mental development and its ability to live in peace are being rapidly approached through the extraordinary and miraculous assistance of science and technology. It is because of science that nations are sharing to-day this globe as their fatherland.

Prom this view point the importance of this first meeting to exchange ideas op. Applied Geology becomes self evident. Along with the desire to place the elements, constituting the component parts of the earth at the disposal of mankind lies in the inlanse urge to discover the secrets of the universe. Geology comes in the forefront of the sciences dedicated to inquire into the secrets of the earth we live on. For this reason, I consider the geologists among the most selfless seekers of science.

The General Director of the Institute is going to explain to you Turkey's efforts and results obtained in the field of geology. I can only say that Turkey, in her activities along this line has not only considered to evaluate her own mineral wealth, but at the same time has borne in mind the prosperity, happiness and security of mankind. And in this work she has opened freely her doors to the geologists from various parts of the world. -The fact that to-day along with our Turkish geologists, geologists from many countries work side by side is a proof of our own contribution to international cooperation. In this way we perform and shall continue to perform our part in evaluating our subsurface wealth and offer it to the use of the international world. I am confident that the participants of the "Symposium on Applied Geology In the IN ear East" will discuss the results of their works and experiences in their respective countries fqr the benefit of their own country as well as mankind.

Honourable Participants»

1 thank each of you separately for leaving even for a short time the very important work which you do on your respective countries and for the trouble of cpming here to take part in the Symposium*

May this work lead to practical conclusions and recoup mendations to which I can assure you the Government of this qountry will give its utmost consideration,

On behalf of the Government I declare the Symposium open".

After His Excellency the Minister's inaugural address, Mr. M. Bâtisse, Director of the UNESCO Middle East Science Cooperation Center of Cairo has made the following speech :

Excellences, Mesdames, Messieurs,

Au nom du Directeur de PUNESCO je me dois avant tout de remercier le Gouvernement Turc qui, par Pappui total qu'il a donné aux organisateurs de ce Colloque, nous a permis d'être réunis ici aujourd'hui. La Commission Nationale Turque pour l'UNESCO n'a pas manqué en cette occasion de jouer son rôle actif de qu'elle liaison remplit toujours avec tant de succès. A l'Institut de Recherches et de Prospections Minières M. T. A., à ses dirigeants et à son personnel, je désire exprimer ici l'expression de notre gratitude la plus profonde. Apés avoir en effet accueilli notre suggestion originelle avec enthousiasme ils n'ont ménagé aucun effort dans la préparation scientifique, administrative et matérielle de la réunion et cela malgré le programme chargé de leurs travaux habituels. C'est à leur équipe dynamique que revient tout le mérite de l'organisation.

Il ne restait pour assurer le suceés de ce Colloque régional que d'obtenir la participation des hommes de science étrangers. Conscients de l'intérêt d'une réunion de ce genre ils ont bien voulu répondre à notre appel, n'hésitant pas pour cela à quitter des occupations nombreuses et des fonctions importantes dans leurs pays respectifs. C'est de cela surtout, en leur souhaitant la bienvenue, que je tiens à les remercier.

Il n'est pas de liberté dans le besoin et seul Paccroissement des ressources économiques permettra de donner à chacun un minimum de bien-être. Il est aujourd'hui évident que le développement des sciences et des techniques est une condition essentielle de ce développement économique sans lequel un équilibre harmonieux ne serait jamais atteint entre les diverses régions du monde.

Sur un autre plan il n'est pas inutile de souligner une fois de plus que c'est dans le domaine scientifique que la coopération internationale possède ses plus anciennes racines et ses plus solides traditions. La science n'a jamais progressé dans l'isolement. Elle requiert un esprit de liberté qui ne doit connaître aucune barrière et aucun égoisme.

Ce sont ces considérations qui devaient conduire naturellement l'UNESCO à entreprendre un vaste programme d'encouragement et de coordination de la science à l'échelle mondiale. Dans ce programme l'action décentralisé des Centres de Coopération Scientifique joue un rôle essentiel de liaison et de stimulation qui prend les formes les plus variées. L'expérience nous a montré que la réunion régionale de groupes de spécialistes était un moyen efficace d'assurer une coopération fructueuse sur des problèmes précis.

Le choix de la Géologie appliquée pour une telle réuniondans le Proche Orient ne saurait surprendre. Dans cette région à la fois riche en ressources minérales mais souvent pauvre en eau, jusqu'à une époque assez récente seules des études fragmentaires avaient été faites. Depuis quelques années un essor économique remarquable est en cours où la géologie a un rôle particulièrement important à jouer. Dans l'état d'interdépendance du monde moderne où la population s'accroît rapidement il importe qu'une exploitation judicieuse des ressources de la nature soit effectuée en évitant tout gaspillage. Il importe en même temps-comme l'UNESCO le souligne par son programme sur la zone aride que de nouvelles terres soient mises en valeur partout où c'est possible.

Je suis persuadé que. ce Colloque, en rassemblant dans une

atmosphère cordiale un groupe de spécialistes éminents, contribuera - comme les Colloques qui Font précédé et comme ceux qui le suivront - par une meilleure connaissance de la nature à une entente plus profonde entre les hommes.

Following Mr. Bâtisse's speech Professor in Ordinary, Dr. Tevfik Sağlam President of the Turkish National Committee for the UNESCO delivered the following speech :

"His Excellency the Minister, Ladies and Gentlemen, The Turkish National Committee for the UNESCO, being deeply convinced of the utmost usefulness of holding regi°nal scientific conventions which ensure personel contacts and close cooperation of the specialist of these countries, hails with great enthusiasm the convention in Ankara of the Symposium on Applied Geology for the Near and Middle East coutnries, which was organised jointly by the UNESCO Scientific Cooperation Center and the Mineral Research and Exploration Institute; Ankara.

On behalf of the Turkish National Committee for the UNESCO I should like to thank Mr. Hamid N. Pamir, Director General of the Mineral Research and Exploration Institute as well as his collaborators who have well organised the Symposium and made a success of it.

I bring to a close my words by wishing all the success for the activities of the Symposium."

The last gentleman to talk was Professor in Ordinary, Hamit N. Pamir, Director General of the Mineral Research and Exploration Institute, who greeted all the participants and guests on behalf of the said Institute and of the Turkish Organisation Committee, emphasized on the importance of such a convention and gave a summary of the volume of the work and on the promising results so far obtained on Applied Geology in Turkey and at the Mineral Research and Exploration Institute in particular and said:

"It would, no doubt, be superfluous to try to explain before you the important role played in the economies of the countries by the progress made in sciences and especially in geology, which we are closely related to.

I do not, either; deem it necessary to illustrate with an

example the working manner of a geologist who by giving magic blows of hammer on a rocK, may pave the way to the development and prosperity of the locality which he is studying. • However, 1 should like to dwell upon the fact that if more consideration is given to the opinion of the specialïst-with-a-hammer, if he is to receive more assistance and lesser and unsuccessful ventures would be avoided.

When I was younger, a scientist of great fame used to tell me repeatedly: "There are no applied sciences" he would say, "but applications of sciences".

This is what we understand from his saying. Applied Geology is nothing but an application of sound scientific studies which were conducted with great patience and diligence.

The outstanding results of such studies are the stratigraphical tectonical ana geological maps.

It is based on these maps that the geophysicists, petro» graphers, mineralogists, and later on drillers and miners, hydrogeologists will look for and exploit valuable elements which alter completely, our economic life, or briefly our life. But we should not forget that the application of scientific researches and results thereof are not the work of an individual technical person engaged at work at the laboratory or in front of a drawing.

Exhange and comparison of ideas and conclusions of the results obtained, acquiring the, manner of solving a particular problem in the neighboring or a far-away country, estimation of the chance of success or failure of a venture by comparing the methods, basic documents and preliminary results relative thereto are the only ways leading to great achievements and discoveries.

We are deeply impressed to see that Turkey has been given preference for such a Symposium and also preference has been made over the exchange of ideas and research results on the field of Applied Geology«

Amongst the great strides made by Turkey in-her economic recovery, one can imagine the paramount importance played by the explorations and evaluations of oil, mines, coal and underground waters, and how interesting it would be the working programs of a set up which has been assigned with these explorations and evaluations.

Until lately Turkey was an undiscovered country for the explorers of nature. In a great majority of the country, geological surveys were conducted superficially along narrow and poor roads, in localities situated far apart from one another. In brief, our geological knowledge on Turkey was solely as rare and dime lights in the dark of the night. Atatürk's young Turkey could not, among innumerable problems which she had to tackle both in the fields of science and economy, leave her geological ex plorations to hazards; hence, the Mining Research and Explora-Institute was created in the year 1935 with a view to tion performing work on the basis of regular and systematic programs. Since that date, private enterprises as well as Government departments have been very much interested in the problems of Applied Geology, be it in the field of mining or of public works, or in search of raw materials, and many mines have been turned systematic exploitations from the exploratory and survey phases."

After giving a brief summary on the MTA's activities and illustrating it with examples and figures, said Professor Pamir:

"I hope that a few examples I have cited here will serve to show how primordial is the part played by the geologists in the exploration of Turkey, and that how useful it would be for all the Turkish geologists and their foreign colleagues who work in Turkey with the very same feeling, to bring up before you the conclusions of the studies and researches, the successes and the difficulties.

Furthermore, we feel confident that we shall drive great benefits from the experiences and ideas of the scientists of the neighbouring countries, which these gentlemen will discuss mostly the problems encountered in these countries on Applied Geology."

Prof. Pamir has ended his address after thanking separately those concerned with the Symposium. After which, all the participants, accompanied by their Turkish colleagues have proceeded to the President of the Republic's Palace to sign the visitors' book and thence they visited Atatürk's mausoleum to pay tribute to the late Atatürk and lay a wreath on his tomb. Following the inaugural ceremony, scientific work went on in the afternoon of the same day in the Library Hall of the MTA Institute. The work program has been concentrated on *these 3 main lines, viz.,

p_{ar}t I — Scientific communications and discussions

- 1. Methods of Applied Geology (Geological, geophysical, geochemical, etc. methods).
- 2. Economic Geology
- i. Metallic ores
- ii. Non-metallic ores
- iii. Coal
- iv. Oil
- v. Hydrogeology
- 3. Engineering Geology

Part II — Study Groups

- a) Existing conditions of geological, geomagnetic mapping in the participating countries;
- b) Problems relative to the training of geologists and other specialists in the earth sciences in these countries;
- c) Mining legislation and their technical aspects.

Part II — General Discussions

Final reports of the study groups who worked as committees.

The discussions were carried either in French or in English, as agreed upon previously, and inasmuch as a great majority of the participants spoke both these languages there was no need for a simultaneous interpreting, which usually lay heavy burdens on the organising institutions for similar conventions.

A great many of the discussions have been tape-recorded. The following have organised the Symposium :

UNESCO : M. Bâtisse, Acting director, UNESCO Middle East Scientific Cooperation Center, Cairo.

Turkish Organisation Committee:

Professor in Ordinary Hamir N. Pamir, General Director of the MTA Institute, President;

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Assistant - Professor, Dr. Nuriye Pınar, Member of Parliament, Vice-president

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Dr. Kâzım Ergin, Director of the Department of Geology, MTA Institute, Secretary

Dr.Melih Tokay, Assistant-Director of the

Department of Geology, MTA Institute, Secretary and the following members have participated in the conventions.

PRANCE : F. Blondel,

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President of the Commission of the World Geological Map. President, French Engineers Association, Director, Geological and Mining Research Bureau of the French Colonies Prof. P. Routhier, Professor of Applied Geology, Sorbonne University Paris, France : * | Professor José Maria Rios, Professor of Geology, Spain: School of Mines. Madrid Professor Ardito Desio, Professor of Geology-Hidro-Italy: geology, University of Milan Irak H. C. B. Leitch Geologist of the National Economy Economy Ministry Khorshid Al Naqib, Geologist, Irak Petroleum Co. Bagher Mostofi, Director General Iran: of the Iran National Petroleum Company Mining Consultant, Abbas Zahedi, Ministry of National Economy Cyprus: Dr. F. T. Ingham, Director, Geological Survey of .Cyprus Leban©n : Dr. M. L. Dubertret, Consultant geologist of Lebanon, Member of the Commission of the World Geological Map

- Egypt: Prof. Dr. M. A. Gheith, Acting professor of geology, University of Ayn Şems;
 - E. J. Harrison UN Specialist at the Desert Institute of Egypt;

O. Moharram Mahgoub, Chief Inspector, Department of Mines and Ouarries Mousa Sadek, Geologist, Desert Irrigation Department Dr. A. Shatta, Geologist at the Desert Institute of Egypt: Dr. E. M. El Shazly, Geologist, Egyptian Geological Survev N. M. Shukry, Professor of Geology, University of Cairo Sudan: M. Abdalla, Director, Sudan Geological Survey Svria: Professor Th. Raven, Professor of Geology, University of Damascus Transjurdan: Dr. Daniel J. Burdon, Hydrogeology specialist of FAO Dr. Sadrettin Alpan, Chief Engineer, Department Turkey: of Mines, MTA Institute Dr. Eaver, Altınlı, Assistant-Prof, of Geology, Department of Geology, University of Istanbul Dr. Hans Gert Bachmann, Expert mineralogist, MTA Institute Orhan Bayramgil, Assistant Dr. professor of Mineralogy and Petrography, Departement of of Geology, University of Istanbul Dr. Abraham ten Dam, Geologist Dr. Salahi Diker. Geophysical engineer, MTA Institute Dr. Necdet Egeran, Vice president of the Turkish Petroleum Administration Dr. Cahit Erentöz. Director of the Assistant Department of Geology, MTA Institute, Dr. Lütfiye Erentöz, Chief of the Paleontological Section, MTA Institute, Dr. Kâzım Ergin, Director of the Department of Geology, MTA Institute Dr. Tryggve Eriksson UN Specialist at the MTA Institute PiyŞuat Şrk, Lecturer, at the Ankara University

- Ömer Eskici, Assistant Director General, MTA Institute
- Dr. Tore Gjelsvik, UN Specialist at the MTA Institute
- Dr. Ekrem Göksu, Assistant professor, School of Mines, Technical University, Istanbul
- Professor in Ordinary Gaston Grenet, Director, Department of Geophysics, University of İstanbul
- Dr. Gerrit v. d. Kaaden, Expert petrographer, MTA Institute
- Ahmet Keretli, Geodetical engineer, Turkish geodetic Survey
- Dr. Ihsan Ketin, Professor of Geology, school Mines, Technical University, Istanbul
- Dr. Hubert Kleinsorge, Consultant Geologist at the Bureau of Electrification Surveys
- Kemal Lokman Technical Adviser at the MTA Institute
- Dr. İhsan Özdoğan, Assistant professor, Department of Geophysics, University of Istanbul
- Dr. Galip Otkun, Assistant Director, Material Research Department, Turkish Public Roads Administration

Professor in Ordinary, Hamit N. Pamir, Director General MTA Institute

Ahmet Pekkan, Mining Geologist

- Sadettin Pekmezciler, Chief of the Lignite Section, MTA Institute
- Assistant Professor Dr. Nuriye Pınar, Member of Parliament
- Dr. Galib Sağıroğlu, Assistant Professor, school of of Mines, Techinical University, İstanbul
- Dr. Etienne J. P. Stretta UNESCO Specialist at the Institute of Hydrogeology Techinical University, Istanbul
- Cevat Taşman, Consultant at the Turkish Petroleum Administration
- Mehlika Taşman, Chief of Subşurfaçş Geology şşçtiç>n, MT4 Institute

- Dr. Zati Ternek, Chief of Petroleum Geology section.. MTA Institute
- Dr. Melih Tokay, Assistant Director, Department of Geology, MTA Institute
- Dr. Necip Tolun, Geologist
- Dr. Raşit Tolun, Chief, Mineralogical section, MTA Institute
- Dr. Mehmet Topkaya, Geologist
- Dr. Paul de Wijkerslooth, Expert Petrographer, MTA Institute
- Yougoslavia: Professor Stefan Pavloviç, Director of the Mineralogical and Petrographical Department, Belgrade University, Professor Josep Ogulinec, Director of the Geological Institute of Croatia

Inasmuch as the communications as weel as the discussions and decisions will be published by the Cairo center in detail in a few months, we shall suffice to state here only the titles of thesD communications, and discussions.

I – Scientific Communications and Discussions.

1 — Methods of Applied Geology

The development and study of a resistivity methad of propecting applicable in two dimensional valleys

(M. Dizâoğlu)

2 - Economic Geology

a) Metallic Ores

Reserves minérales et exploitabilité des gisements minéraux (F. Blondel)

Note on the mineral resources of Cyprus (F, T, Ingham) Recent investigations on the Egyptian Coppşr Deposits (E. M. El Shazlyl

On the genesis and mineralisation of the Tungsten deposits Uludağ, province of Bursa, Turkey (G. v. d. Kaaden)

Uludağ Tungsten Deposits (S. Alpan)

'Bursaite, a new mineral $Pb_5 Bi_4 S_n$ -(R. Tplun)

The morphological and optical properties of Bursaite P. de Wijkerslooth) The general geology of the Sinai Peninsula and its relationship to petroleum occurrences (A. Shata)

The part played by asphalt in the exploration of crude oil (JL Ogulinec)

Oil Possibilities and development in "Turkey (N* Egeran) Stratigraphy, tectonics and oil possibilities in the SE of Turkey (N. Tolun, A. ten Dam)

Geology of the Kerkük oilfield (K. M. Al Naqib)

The Lower Miocene Formations of the Adana Basin, relations thereof with the other formations, and oil possibilities therein (Z. Ternek)

Correlation of Adana oild wells by means of quantitative analysis of Foraminifera (M.* Taşman)

Nouvelles observations sur le Néogène de TAnatoiie mérid-

onale (L. Erentöz)

d) Coal

A general outlook on the Turkish lignites (S. Pekmezciler) $3 - Hydr \circledast geology$

Les recherches hydrogeologiques dans le Désert Ouest Egyptien (M. Sadek)

Underground waters and populating of arid and semi-arid regions (A, Desib)

Construction of Recharge Maps for use in ground water purvey, (D. J. Burdon)

Field conductivity determnations as an aid to hydrogeologicalsurveying (E. J. Harrison)

.Typical problems of applied hydrogeology in Turkey

(K X P. Strette)

Aperçu sur rHydrogéologie "des•..terrains volcaniques:\de la gyrie, mşrl41onMe CHanrane) (Cb, éafadi) " "~'~____

4 - Engineering geology

Les anciennes constructions dans les regions séismiques de la Turquie (N. Pmar)

The electrification plan of Turkey and its relation to geology (H. Kleirisorge)

II – Study Groups

a) The situation of basic documents existing in the participating countries (geological geomagnetic and other maps)

Sur le role des documents de base dans l'Application de la Géologie.

L'état d'avancement des documents de base au Liban (L. Dubertret)

Progress made in petroleum explorations in Sudan

(M . A. Abdalla)

Note on Basic Documents on Geology of Iran (B. Mostofi)

Organisation de la Géologie formation des géologues et développement dés richesses minérales en Yougoslavie .

(S. Pavlovic)

Present status of survey activities in Turkey (A. Keretli)

Origin and development of official geological mapping of Spain (J. M. Rios)

On the geological mapping in Turkey (C. Erentöz)

Organisation d'un inventaire des ressources minérales d'un pays (F.. Blonde) 1

After the discussions, the report of the Basic Documents Study Group has been drawn up, a synopsis of which is given herein below :

* "The report to be submitted to UNESCO and to the Council of the International Congress of Geology proposed to be held in the year 1956 in Mexico, contains recommendations with the objective of harmonising the geological activities conducted in the countries lying in this part of the world.

The National Geological Maps are documents of importance which play a very important part in the economic development of modern countries. Construction and publication with explanatory notes of the maps which are compiled based on long term studies should not, for various reasons, be delayed. It is deemed actyisaWe tjiat utmost ear§ shpiild be e^erei^eçî ip order tînat the stopographical maps prepared by private enterprises on several occasions be compiled in a governmental department concerned with such mapping; that aerial photos are made use of as much as possible, and that the necessary administrative and financial facilities are secured to this official and central department.

The International Geloical Map is the most useful element in international cooperation which fact has been accepted unanimously by the participants of the Symposium, and which in turn will provide great facilities to the activities of the Commussion for the World Geological Map, which is section of the International Congress of Geology.

If feasible, an "Association of the Geological Services in the Near East'¹ should be set up, which association should provide periodic contacts. Every country should send delegates to the International Congress of Geology.

Every country should also take in hand construction of geological maps, which constitute the basis of rational mining explorations, even if such a task would be a long term one. It is observed, with great satisfaction, that the points enumerated lierein are realised in certain countries.

Mining Explorations :

The base of modern economy is the mining industry, which is, in turn based on mining explorations. As all of the occurrences, easily explorable, are practically known, new explorations are conducted only under very difficut conditions. Accordingly, it is imperative that the States give assistance to such activities.

The organisational set up of institutions, assigned with geological surveys of mining researches, which receive assistance from or which are under the direct management of the State should as much as possible be as flexible as that of private enterprises. A list of the mineral occurrences must be made in connection thereof, maps should be drawn up.

Hydrogeology

Since the water requirements of many countries are constantly increasing, underground waters should be systematically searched for, and these should be used and preserved rationally. Hydrogeological maps should, gradually be preparç^ *md* cooperation must beestablished among countries*

- b) Problems relative to the training of geologists and other specialists in the earth sciences:
 Geological training and training camps for young geologists (J. M* Rios)
 Training of hydrogeology specialists in Turkey through the UNESCO Technical Assistance (E. J. P. Stretta)
 Training problems of geologists in Syria (Th. Raven Thoughts on training geologists (E. Altınlı)
 Collaboration between the miner and the geologists, and betterment thereof through education (P. Routhier)
 a) Mining Lagislation: On this subject A Pekkan Turkish
- c) Mining Legislation: On this subject A. Pekkan, Turkish BL C. B. Leitch, for Irak; A. Zahedi, Iran; O. M. Mahgoub, Egyptian J. Ogulinec, Yougoslav, have given information.

Excursions :

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After the fructuous contacts and exchange of ideas on Applied Geology the participants, started on November 18th, 1955 for Ergani and Guleman, accompanied by their Turkish colleagues, which mines are important copper and chrome mining exploitations, then to the Raman oilfields and finally to Diyarbakır to visit the hydrogeological works. Then, they returned to Ankara on November 21st, 1955, and the foreign participants left for their respective countries in a day or two after their return to Ankara.

There is ni doubt a great many advantages have been dérivée from this convention which we might say, went on in full success. During the recent years important achievements have been observed in the Near East in the field of Applied Geology. The countries in this region are sometimes face to face with common problems and sometimes with problems particular to their own country. On this occasion, the Turkish geologists have had the opportunity of getting acquainted with many scientific authorities, have exhanged ideas with them both in and outside the meetings, and although they learned about their experciences, yet on the other hand they told them of their own experiences, giving them an idea on the scientific level and the applications of sciences in Turkey during the recent years.

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