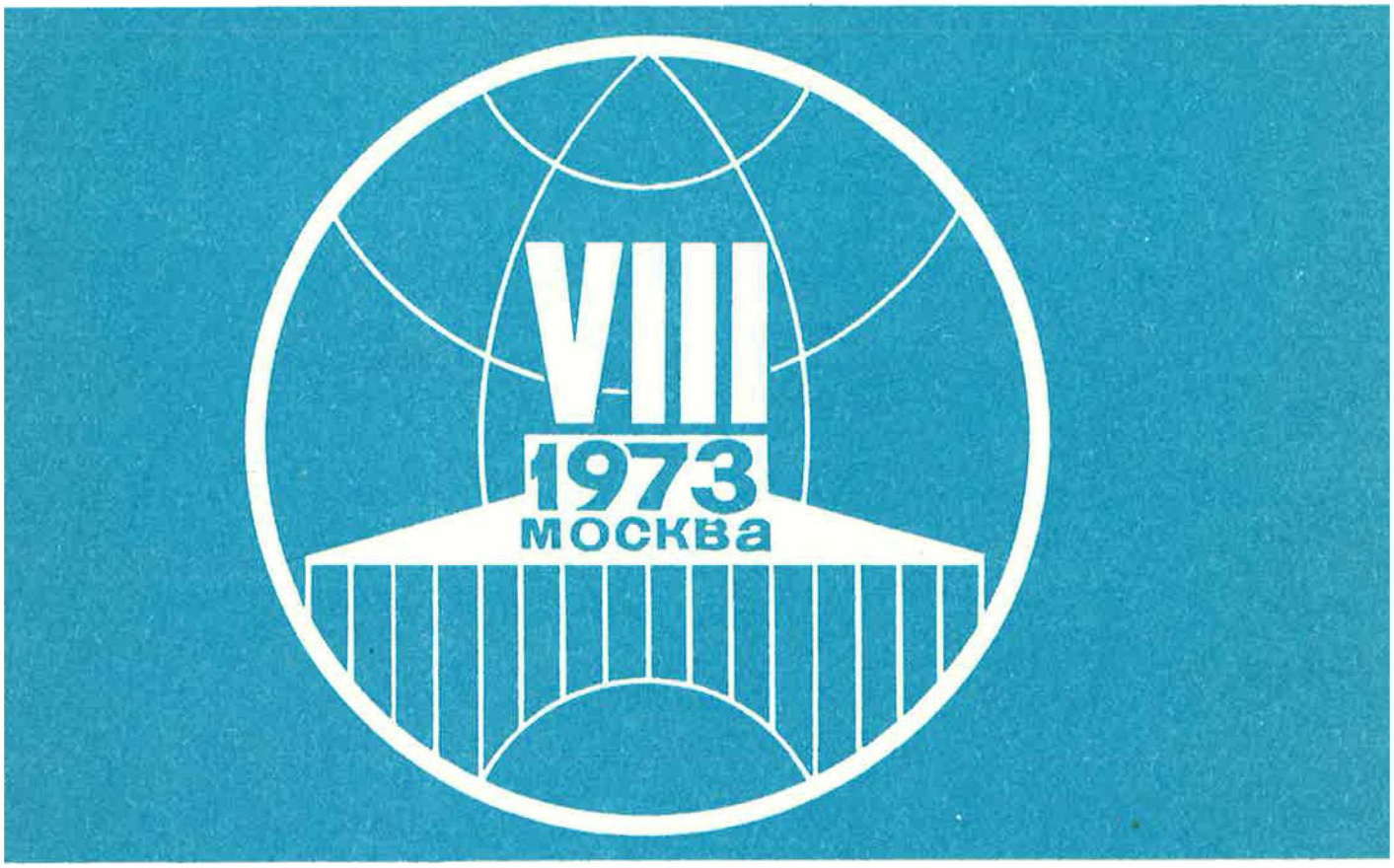

PROCEEDINGS OF THE EIGHTH INTERNATIONAL CONFERENCE ON SOIL MECHANICS AND FOUNDATION ENGINEERING

ТРУДЫ ВОСЬМОГО МЕЖДУНАРОДНОГО КОНГРЕССА ПО МЕХАНИКЕ ГРУНТОВ И ФУНДАМЕНТОСТРОЕНИЮ

4.1

COMPTES RENDUS DU HUITIEME CONGRES INTERNATIONAL DE MECANIQUE DES SOLS ET DES TRAVAUX DE FONDATIONS

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PROGRAMME
ПРОГРАММА ЗАСЕДАНИЙ КОНГРЕССА

PROGRAM

6 August, Monday

10.00a.m.-12.30p.m. Opening Ceremonies of the Conference
Chairman: Prof. Ralph B. Peck, USA
President ISSMFE

10.05a.m.-10.15a.m.
Welcome Address- I.A.Ganichev, USSR
Chairman, Organizing Committee

10.15a.m.-10.40a.m.
Welcome Addresses

10.40a.m.-11.10a.m.
Opening Address- Prof. Ralph B. Peck, USA
President, ISSMFE

11.10a.m.-11.25a.m.
Intermission

11.25a.m.-12.05p.m.
Report: "Achievements in the Field of Soil Mechanics and Foundation Engineering in the USSR"- I.A.Ganichev, USSR
Chairman, Organizing Committee

12.05p.m.-12.20p.m.
Technical Film

12.20p.m.-12.30p.m.
Information- N.S.Chetyrkin, USSR
Secretary General, Organizing Committee

3.00 p.m.
Concert

7.00p.m.
Reception in the Arbat restaurant

7 August, Tuesday

9.00a.m.-9.45a.m.
Special Lecture: "The Bicentennial of C.Coulomb's Theory of Loose Media"- Prof. J.Kerisel, France
Representative, Organizing Committee: S.B.Ukhov,
Scientific Secretary: A.S.Panenkov

9.45a.m.-10.00a.m.
Intermission

10.00a.m.-12.30p.m. Main Session I
"Up-to-Date Methods of Investigating the Strength and Deformability of Soils (Laboratory and Field Testing of Soils for Their Strength, Deformative and Rheological Properties)".
Chairman: Prof. L.Suklje, Yugoslavia
Vice-Chairman: Prof. G.G.Meyerhof, Canada
Scientific Secretary: V.P.Petrukhin,
Representative, Organizing Committee: Prof. S.S.Vyalov

10.00a.m.-10.10a.m.
Introduction- Prof. L.Suklje, Yugoslavia

10.10a.m.-10.50a.m.
General Report- Prof. T.W.Lambe, USA

10.50a.m.-11.05a.m.
Comments-Prof. A.Casagrande, USA
Past-President, ISSMFE

11.05a.m.-11.20a.m.
Intermission

11.20a.m.-12.10p.m.
Discussion on the "Conclusions, Recommendations and Topics for Discussion" proposed by the General Reporter

12.10p.m.-12.20p.m.
Concluding Remarks- Prof. T.W.Lambe, USA
General Reporter

12.20p.m.-12.30p.m.
Closing Speech- Prof. L.Suklje, Yugoslavia

SPECIALITY SESSIONS

Session No.1 (State Concert Hall) "Equipment for the Observation of Settlements and Stresses of Bases" Chairman: Prof. Stanley D.Wilson, USA
Vice-Chairmen:
Prof. G.Stefanoff, Bulgaria
D.S.Baranov, Senior Researcher USSR
Scientific Secretary: V.M.Mamonov

2.30p.m.-2.50p.m.
Report by the Chairman-Prof. Stanley D. Wilson, USA

2.50p.m.-3.10p.m.
Reports by the Vice-Chairmen

3.10p.m.-3.45p.m.
Reports and discussion proposed by the Chairman

3.45p.m.-4.00p.m.
Intermission

4.00p.m.-4.50p.m.
Discussion from the floor

4.50p.m.-5.00p.m.
Concluding Remarks by the Chairman

Session No.2 (Cinema Hall) "Problems of Nonlinear Soil Mechanics".
Chairman: Dr. Yu.K.Zaretsky, USSR
Scientific Secretary: V.A.Barvashov

2.30p.m.-2.50p.m.
Report by the Vice-Chairman-Dr. Sc. Yu.K.Zaretsky, USSR

2.50p.m.-3.45p.m.
Reports and discussion proposed by the Chairman

3.45-4.00p.m.
Intermission

4.00-4.50p.m.
Discussion from the floor

4.50-5.00p.m.
Concluding Remarks by the Chairman

8 August, Wednesday

9.00-9.45a.m.
Special Lecture: "Problems of Soil and Rock Mechanics in Geomechanics"
Prof. N.A.Tsytovich, USSR
Representative, Organizing Committee
S.B.Ukhov,
Scientific Secretary: A.S.Panenkov

9.45-10.00a.m.
Intermission

10.00-12.30p.m.
MAIN SESSION 2
"Interaction of Soil Bases and Structures (Prediction of Settlement, Design of Massive Foundations, Based on the Limiting State, Design of Flexible Foundation Beams and Slabs)"
Chairman: Prof. Edward De Beer, Belgium
Vice-Chairman: Prof. D. Krsmanovič, Yugoslavia.
Representative, Organizing Committee: V.V. Mikheev, Science Director, Research Institute for Bases and Underground Structures.
Scientific Secretary: V.G. Fedorovsky

10.00a.m.-10.10a.m.
Introduction- Prof. Edward De Beer, Belgium

10.10a.m.-10.50a.m.
General Report- Prof. M.I. Gorbunov-Possadov, USSR, Prof. S.S. Davidov, USSR

10.50a.m.-11.05a.m.
Report-Prof. D. Krsmanović, Yugoslavia

11.05a.m.-11.20a.m. Intermission

11.20a.m.-12.10p.m.
Discussion on the "Conclusions, Recommendations and Topics for Discussion", proposed by the General Reporters

12.10p.m.-12.20p.m.
Concluding Remarks-Prof. S.S. Davidov, USSR General Reporter

12.20p.m.-12.30p.m.
Closing Speech- Prof. Edward de Beer Belgium

SPECIALTY SESSIONS

Session No.3 (State Concert Hall) "Design of Earth and Rockfill Dams"
Chairman: Prof. V.S. Eristov, USSR
Vice-Chairmen: Dr. P. Anagnosti, Yugoslavia
L.N. Rasskazov, Senior Researcher, USSR
E.G. Gaziev, USSR
Scientific Secretary: E.G. Dyakonova,

2.30p.m.-2.50p.m.
Report by the Chairman- Prof. V.S. Eristov USSR

2.50p.m.-3.10p.m.
Reports by the Vice-Chairmen

3.10p.m.-3.45p.m.
Report and discussion proposed by the Chairman

3.45p.m.-4.00p.m.
Intermission

4.00p.m.-4.50p.m.
Discussion from the floor

4.50p.m.-5.00p.m.
Concluding Remarks by the Chairman

Session No.4 (Cinema Hall) "Soft Soil Bases of Concrete Hydrotechnical Structures"
Chairman: Prof. Bengt B. Broms Sweden
Vice-Chairmen: Prof. O.A. Savinov, USSR, V.M. Pavilonsky, Senior Researcher, USSR
Scientific Secretary: V.G. Radchenko

2.30p.m.-2.50p.m.
Report by the Chairman-Prof. Bengt B. Broms Sweden

2.50p.m.-3.10p.m.
Reports by the Vice-Chairmen

3.10p.m.-3.45p.m.
Reports and discussion proposed by the Chairman

3.45p.m.-4.00 p.m.
Intermission

4.00p.m.-4.50p.m.
Discussion from the floor

4.50p.m.-5.00p.m.
Concluding Remarks by the Chairman

9 August, Thursday

9.00a.m.-9.45a.m.
Special Lecture: "Research in Lunar Soil Mechanics"-Prof. I.I. Cherkasov, USSR
Prof. Ronald F. Scott, USA.
The Lecture was read by Prof. I.I. Cherkarsov, USSR

Representative, Organizing Committee: V.V. Mikheev
Scientific Secretary: A.S. Panenkov

9.45a.m.-10.00a.m.
Intermission

10.00a.m.-12.30p.m. Main Session 3
"Deep Foundations, Including Pile Foundations (Design and New Methods of Construction)"
Chairman: Prof. A. Kezdi, Hungary
Vice-Chairmen: Dr. G. Petrasovits, Hungary
Prof. D. Mohan, India
Scientific Secretary E.S. Panenkov
Representative, Organizing Committee: Yu.G. Trofimenkov, Vice-President USSR ISSMFE

10.00a.m.-10.10a.m.
Introduction-Prof. A. Kezdi, Hungary

10.10a.m.-10.50a.m.
General Report- Prof. L. Zeevaert, Mexico

10.50a.m.-11.05a.m.
Comments- Prof. Ralph B. Peck, President, ISSMFE

11.05a.m.-11.20a.m.
Intermission

11.20a.m.-12.10p.m.
Discussion on the "Conclusions, Recommendations and Topics for Discussion" proposed by the General Reporter

12.10p.m.-12.20p.m.
Concluding Remarks-Prof.L.Zeevaert,Mexico General Reporter

12.20p.m.-12.30p.m.
Closing Speech- Prof.A.Kezdi,Hungary

SPECIALTY SESSIONS

Session No.5 (State Concert Hall) "Lateral Pressure of Clayey Soils on Structures"
Chairman:Dr.G.P.Tschebotarioff USA
Vice-Chairmen:Prof.G.K.Klein, USSR
Prof.M.V.Malyshev, USSR
Scientific Secretary:G.M.Troitsky

2.30p.m.-2.50p.m.
Report by the Chairman-Dr.G.P.Tschebotarioff, USA

2.50p.m.-3.10p.m.
Reports by the Vice-Chairmen

3.10p.m.-3.45p.m.
Reports and discussion proposed by the Chairman

3.45p.m.-4.00p.m.
Intermission

4.00p.m.-4.50p.m.
Discussion from the floor

4.50p.m.-5.00p.m.
Concluding Remarks by the Chairman

Session No.6 (Cinema Hall) "Stability of Slopes of Deep Excavations and Natural Slopes"
Chairman:Prof.N.N.Maslov,USSR
Vice-Chairmen:Prof.A.W.Bishop, England, S.N.Maximov,Senior Researcher, USSR
Scientific Secretary:V.D.Braslavsky

2.30p.m.-2.50p.m.
Report by the Chairman-Prof.N.N.Maslov, USSR

2.50p.m.-3.10p.m.
Reports by the Vice-Chairmen

3.10p.m.-3.45p.m.
Reports and discussion proposed by the Chairman

3.45p.m.-4.00p.m.
Intermission

4.00p.m.-4.50p.m.
Discussion from the floor

4.50p.m.-5.00p.m.
Concluding Remarks by the Chairman

10 August, Friday

9.00a.m.-9.45a.m.
Special Lecture:"Problems of Soil Mechanics of the Ocean Floor" Prof.M.Fukuoka, Japan and Mr.A.Nakase,Japan
Representative,Organizing Committee: R.A.Tokar,
Scientific Secretary:A.S.Panenkov

9.45a.m.-10.00a.m.
Intermission

10.00a.m.-12.30p.m. Main Session 4
"Problems of Soil Mechanics and Construction on Soft Clays and Structurally Unstable Soils (Collapsible,Expansive and Others)"
Chairman:Prof.G.A.Leonards,USA
Vice-Chairman:Prof.B.I.Dalmatov,USSR
Scientific Secretary:Zolotariova,A.V.
Representative,Organizing Committee: R.A.Tokar

10.00a.m.-10.10a.m.
Introduction-Prof.G.A.Leonards,USA

10.10a.m.-10.50a.m.
General Report-Prof.L.Bjerrum,Norway
A summary of the General Report was read by Prof.G.A.Leonards, Dr.C.M.Gerrard, Australia

10.50a.m.-11.05a.m.
In Commemoration of Prof.L.Bjerrum: Scientific Works of Prof.L.Bjerrum, Past-President, ISSMFE - Prof.Ralph B. Peck, President, ISSMFE

11.15a.m.-11.20a.m.
Intermission

11.20a.m.-12.10p.m.
Discussion on the "Conclusions,Recommendations and Topics for Discussion"proposed by the General Reporters

12.10p.m.-12.30p.m.
Closing Speech-Prof.G.A.Leonards, USA

SPECIALTY SESSIONS

Session No.7 (State Concert Hall) "Methods of Soil Stabilization (Chemical,Slurry Trench Construction,etc.)"
Chairman:Prof.H.Cambefort, France
Vice-Chairmen:Prof.B.A.Rzhanitsyn,USSR
Prof.A.N.Adamovich, USSR
Scientific Secretary:E.D.Ardzhevanidze

2.30p.m.-2.50p.m.
Report by the Chairman-Prof.H.Cambefort, France

2.50p.m.-3.10p.m.
Reports by the Vice-Chairman

3.10p.m.-3.45p.m.
Reports and discussion proposed by the Chairman

3.45p.m.-4.00p.m.
Intermission

4.00p.m.-4.50p.m.
Discussion from the floor

4.50p.m.-5.00p.m.
Concluding Remarks by the Chairman

Session No.8 (Cinema Hall) "Soil Dynamics and Seismic Effects on Foundations"
Chairman:Prof.Shamsher Prakash, India
Vice-Chairmen:Prof.A.P.Sinitsyn, USSR
Prof.D.D.Barkan, USSR
Scientific Secretary:E.S.Medvedyeva.

2.30p.m.-2.50p.m.
Report by the Chairman-Prof.Shamsher Prakash, India

2.50p.m.-3.10p.m.
Reports by the Vice-Chairmen

3.10p.m.-3.45p.m.
Reports and discussion proposed by the Chairman

3.45p.m.-4.00p.m.
Intermission

4.00p.m.-4.50p.m.
Discussion from the floor

4.50p.m.-5.00p.m.
Concluding Remarks by the Chairman

11 August, Saturday

10.00a.m.-12.30p.m.
Closing Session
Chairman:Prof.Ralph B.Peck, USA
Vice-Chairman:I.A.Ganichev, Chairman,Organizing Committee
General Secretary: N.S.Chetyrkin

10.05a.m.-10.15a.m.
Opening Address-Prof.Ralph B.Peck
President, ISSMFE

10.15a.m.-10.55a.m.
Brief Reports by the Chairmen on the Work of the Main Sessions
Prof.L.Suklje, Yugoslavia
Prof.E.De Beer, Belgium
Prof.A.Kezdi, Hungary
Prof.G.A.Leonards, USA

10.55a.m.-11.15a.m.
Brief Reports by the Chairmen on the Work of the Specialty Sessions
No.1- Prof.Stanley D.Wilson, USA
No.2- Dr.Sc.Yu.K.Zaretsky, USSR
No.3- Prof.V.S.Eristov, USSR
No.4- Prof.Bengt B.Broms, Sweden

11.15a.m.-11.30a.m.
Intermission

11.30a.m.-11.50a.m.
Brief Reports (continued)
No.5- Dr.G.P.Tchebotarioff,USA
No.6- Prof.N.N.Maslov, USSR
No.7- Prof.H.Cambefort,France
No.8- Prof.Shamsher Prakash,India

11.50a.m.-12.25p.m.
Presidential Address- Prof.Ralph B.Peck
President,ISSMFE

12.25p.m.-12.30p.m.
Closing Address-I.A.Ganichev
Chairman,Organizing Committee

12.30p.m.-13.30p.m.
Technical films

7.00p.m.-10.00p.m.
Banquet

MINUTES OF THE EXECUTIVE COMMITTEE MEETINGS
PROCES-VERBAL DES REUNIONS DU COMITE EXECUTIF
ПРОТОКОЛЫ ЗАСЕДАНИЙ ИСПОЛКОМА МОМГИФ

INTERNATIONAL SOCIETY FOR SOIL MECHANICS AND FOUNDATION ENGINEERING

MINUTES OF THE EXECUTIVE COMMITTEE HELD IN SYDNEY

4th - 5th August, 1971
09.00 - 12.30 and 14.15 - 17.15 each day

PRESENT

President	Prof. R.B. Peck
Vice-Presidents	Mr M.P. dos Santos (Africa) Prof. T. Mogami (Asia) Prof. E.H. Davis (Australasia) Prof. E. de Beer (Europe) - (North America) Mr G.Perez Guerra (South America)
Secretary General	Prof. J.K.T. L. Nash

NATIONAL SOCIETY	VOTING DELEGATE	2ND DELEGATE	NAMED REPRESENTATIVE
Argentine			
Australia	Mr. M. Wood	Prof. D.H. Trollope	
Austria	Prof. H. Borowicka		
Belgium			V-P Europe
Brazil			
Bulgaria	Prof. G. Stefanoff		
Canada	Prof. S. Sinclair		
Chile			V-P Sth America
China (People's Republic)			
Colombia			
Czechoslovakia			V-P Europe
Denmark			V-P Europe
Ecuador			
Finland			V-P Europe
France	Mr. J. Florentin		
Germany (W)	Dr. H.W. Koenig		
Greece			V-P Europe
Hungary			Bulgaria
India			V-P Asia
Ireland			V-P Europe
Israel	Prof. J.G. Zeitlen		
Italy			V-P Europe
Japan	Dr. K. Ishihara	Mr. K. Mitami	
Mexico	Mr. A.L. Ramírez		
Morocco			
Netherlands			
New Zealand	Mr. J.H.H.Galloway	Dr. G.R.Martin	
Norway			V-P Europe
Peru			
Poland			U.S.S.R.
Portugal			
Rhodesia			
South Africa	Mr. B.A. Kantey		
South East Asia	Mr. J.D. Nelson	Mr. P. Lumb	
Spain			V-P Europe
Sweden			
Switzerland			
Turkey			
U.K.	Mr. I.K. Nixon		
U.S.A.	Dr. J.W. Hilf	Dr. E. D'Appolonia	
U.S.S.R.	Prof. N.A.Tsytovich	Mr. Yu.G.Trofimenkov	
Venezuela			V-P South America
Yugoslavia	Prof. I. Sovinc		

In addition the following were invited to attend all or part of the meeting as observers:
The Chairmen of the Official Sub-Committees
The President of the International Society for Rock Mechanics (did not attend)
Dr. Za-Chieh Moh (South East Asia)
Mr. Willy Norup (Geodex Retrieval System).

1 An apology for absence was received from the Vice-President for North America (Dr. MacDonald).

2 A roll was taken of the various countries represented and it was established that there were sufficient for a quorum for general business (one-third necessary), but that there might not be sufficient for changes to be made in the Constitution where representation from two-thirds of the National Societies is needed. It was later established that the required quorum was present.

3 It was reported that an application for membership had been received from the following countries:

Ghana	(Africa)
Iran	(Asia)
Chile	(South America)

4 The application from Ghana had not included a copy of their draft Constitution and Dr Hilf (U.S.A.) proposed that we accept Ghana into membership subject to their papers being found in order by the Secretary General as required by By-Law 1. This was seconded by Mr Kantey (South Africa) and was adopted unanimously.

5 The application from Iran had not included a copy of their draft Constitution and Professor Sinclair (Canada) proposed that we accept Iran into membership subject to their papers being found in order by the Secretary General as required by By-Law 1. This was seconded by Prof. Zeitlen (Israel) and was adopted unanimously.

6 The application from Chile had been found to be in order by the Secretary General and it was proposed by Mr. Ramírez (Mexico) and seconded by Dr Hilf (U.S.A.) that they be accepted into membership. This was unanimously accepted. It was confirmed by the Vice-President for South America that he would be representing Chile forthwith at this meeting.

7 Reports on the activity since 1969 of the various National Societies within each region were given by the Vice-Presidents and by Professor Sinclair speaking for the Vice-President of North America. It was agreed that these should be accepted as interim

1. Les excuses pour l'absence du Vice-President de l'Amerique du Nord ont ete reçues. (Dr.MacDonald).

2. Apres avoir fait l'appel des differents pays presents, il a ete constate qu'il y en avait suffisamment pour constituer un quorum pour les affaires generales (1/3 etant necessaire), mais qu'il n'y en aurait peut-etre pas suffisamment pour permettre des changements aux statuts quand il faut que les 2/3 des Societes nationales soeint representees. Il a ete plus tard etabli qu'un nombre suffisant etait present.

3. Il a ete rapporte que des demandes ont ete reçues des pays suivants, desireux de devenir membres:

Ghana (Afrique)
Iran (Asie)
Chili (Amerique du Sud)

4. La demande faite par le Ghana n'etait pas accompagnee d'une copie de leur projet de constitution et Dr.Hilf (U.S.A.) a propose que nous acceptions le Ghana comme pays membre sous la reserve que leurs papiers soient trouves en ordre par le Secretaire General, conformement a au Statut No.1. Cette proposition a ete appuyee par M.Kantey (Afrique du Sud), et a ete adoptee a l'unanimite.

5. La demande faite par l'iran n'etait pas accompagnee d'une copie de leur projet de constitution et le Professeur Sinclair (Canada) a propose que nous acceptions l'Iran comme pays membre sous reserve que leurs papiers soient trouves en ordre par le Secretaire-General, conformement au Statut No.1. Cette proposition a ete appuyee par le Professeur Zeitlen (Israël) et a ete adoptee a l'unanimite.

6. La demande faite par le Chili a ete trouvee en ordre par le Secretaire-General et M.Ramirez (Mexique) a propose que la Chili soit accepte comme pays membre. Cette proposition a ete appuyee par Dr.Hilf (U.S.A.) et a ete acceptee a l'unanimite. Le Vice-President de l'Amerique du Sud a confirme qu'il allait representer le Chili durant cette seance.

7. Des rapports sur les activites des differentes Societes nationales dans chaque region depuis 1969 ont ete presentes par les Vice-Presidents, et par le Professeur Sinclair, qui parlait de la part du Vice President de l'Amerique du Nord. Il a ete convenu que ces rapports soient acceptes en tant que rapports interimaires et que des rapports ecrits couvrant la

reports and that written reports for the four year period between International Conferences should be asked for in advance of the Moscow Conference for inclusion in the minutes of the Executive Committee. The Vice-Presidents agreed to supply a list of post-Mexico and pre-Moscow meetings for circulation to National Societies.

8 Professor Sinclair proposed that the reports of the Vice-Presidents should be submitted in advance of an Executive Committee meeting so as to make for better discussion. This was seconded by Dr Hilf and was accepted unanimously.

9 Professor de Beer proposed on behalf of the Swedish Geotechnical Society that the name of the International Society should be changed to the International Geotechnical Society. This was seconded by Dr Hilf in order to permit discussion. A lengthy discussion followed and many delegates expressed the view that the proposed change of name should not be accepted unless there is a union between our Society and the Rock Mechanics and Engineering Geology Societies.

On the vote the motion was lost by a very large majority.

10 Professor de Beer proposed on behalf of the Swedish Geotechnical Society that one of the Vice-Presidents be designated as first Vice-President. This was seconded, on behalf of Norway, by Professor de Beer, who also spoke in favour on behalf of Czechoslovakia, Spain and Ireland. There was no other support from the meeting and the motion was lost.

11 Professor de Beer proposed on behalf of the Swedish Geotechnical Society that there should be an associate Vice-President elected for each region. The motion was seconded on behalf of Czechoslovakia by Professor de Beer. Professor Sinclair proposed as an amendment to the proposal that the wording be changed to ... "that there may be an associate Vice-President elected for each region at the discretion of the member countries making up that region." This was seconded by Mr. Kantey.

It was agreed that to accept an amendment to the previously circulated motion did not conflict with the Constitution, since the amendment did not contradict the motion. After discussion the

periode de quatre and entre les conferences internationales soient demandees avant la conference de Moscou afin d'etre les conferences internationales soient demandees avant la conference de Moscou afin d'etre inclus avec le proces-verbal du comite executif.Les Vice-Presidents etaient d'accord de fournir, pour distribution aux Societes Nationales,une liste des seances qui eurent lieu entre celle a Mexique et celle a Moscou.

8. Le Professeur Sinclair a propose que les rapports des Vice-Presidents soient soumis avant la seance du comite executif afin de permettre une meilleure discussion. Cette proposition a ete appuyee par le Dr.Hilf et a ete acceptee a l'unanimite.

9. Le Professeur de Beer a propose,au nom de la Societe Geotechnique Suedoise,que le nom de la Societe Internationale soit change en la Societe Geotechnique Internationale.Cette proposition a ete appuyee par le Dr.Hilf pour permettre la discussion generale.Une longue discussion s'en suivit au cours de laquelle beaucoup de delegues ont exprime l'opinion que le changement de nom propose ne soit pas accepte, a moins qu'il n'y ait une union entre notre Societe et les Societes de Mecanique des Roches et de Geologie de l'Ingenieur.

Lorsquela motion a ete mise aux vois, elle a ete rejetee a une grande majorite.

10. Le Professeur de Beer a propose,au nom de la Societe Geotechnique Suedoise,qu'un des Vice-Presidents soit nomme premier Vice-President. Cette proposition a ete appuye,au nom du Norvege,par le Professeur de Beer, qui parlait egalement en faveur de la proposition au nom de la Tchecoslovaquie, de l'Espagne et de l'Irlande. Il n'y avait aucun autre appui, et la motion a ete rejetee.

11. Le Professeur de Beer a propose,au nom de la Societe Geotechnique Suedoise,qu' il soit elu un Vice-President associe pour chaque region. La motion a ete appuyee, au nom de la Tchecoslovaquie, par le Professeur de Beer. Le Professeur Sinclair a propose comme modification a la proposition, que les termes soient changes comme suit: "qu'un Vice-President associe puisse etre elu pour chaque region a la discretion des pays-membres constituant cettre region". Cette modification a ete appuyee par M.Kantey. Il a ete convenu que le fait d'accepter une modification a une motion,apparavant mise en circulation, n'etait pas en desaccord avec les status, puisque la modification ne contredisait pas la motion.

Apres discussion, la modification n'a pas

amendment was not accepted and the motion was lost.

12 The President moved a motion along the lines of that proposed by the Secretary General so that Paragraph 4 of the Constitution should read "The official languages of the Society are English and French, but the English versions of the Constitution, By-Laws and Minutes are to be preferred where there is a difference in meaning." Professor Zeitlen proposed as an amendment to this . . . "but should a difference in meaning arise between the English and French versions of the Constitution, By-Laws and official minutes of meetings, the President will be authorised to decide as to the preferred meaning." The amendment was carried and the President ruled that the English version of By-Law 12 (v) is to be preferred.

13 Professor Sinclair proposed the following motion; that By-Law 12 (ii) be deleted and the following substituted:-

"Voting shall in general be by a show of hands. However, for the election of the President, for the selection of the place of the next International Conference, and for other matters specified at the time by the Chairman, a secret preferential ballot shall be used with each eligible voter having a single transferable vote. When more than two choices are available, and none of the choices receives a clear majority on the first ballot count, that choice receiving the fewest first preferences shall be deleted and the corresponding ballots redistributed to the other choices according to the second preferences. The procedure shall be repeated using as many preferences as required to obtain a clear majority." The motion was seconded by Mr Kantey. Much sympathy was expressed for the motion but some felt that changes were desirable, and Professor Sinclair was asked to bring in a revised version for consideration later in the meeting.

14 A proposal from the Swedish National Society that the rules of conduct of a meeting be simplified was not accepted.

15 Professor de Beer proposed, on behalf of the Swedish National Society, that the Constitution and By-Laws be printed as a single combined document, and he also seconded it on behalf of Czechoslovakia.

ete acceptee et la motion a ete rejetee.

12. Le President a propose une motion comparable a celle proposee par le Secretaire-General pour que l'Article 4 des Statuts soit comme suit:

"Les langues officielles de la Societe sont l'anglais et le français, mais la version anglaise des Statuts, Reglements et Proces-verbaux sont preferables lorsqu'il existe une difference dans le sens".

Le Professeur Zeitlen a propose la modification suivante a cette motion :

"mais au cas ou il surviendrait une difference de sens entre la version anglaise et la version française des Statuts,Reglements et Proces-verbaux officiels des reunions,le President sera autorise a choisir l'interpretation preferee".

La modification a ete adoptee et le President a determine que les versions anglaises du Reglement 12 (V) sont a preferer.

13. Le Professeur Sinclair a propose la motion suivante: Que le Reglement 12 (ii) soit supprime et remplace comme suit: "Le mode de votation aura lieu en general a mains levees.Cependant,pour l'election du President, pour le choix de lieu de la prochaine conference internationale, et pour d'autres sujets specifies a ce moment-la par le President,un scrutin preferentiel secret sera employe, chaque votant eligible ayant un seul vote transferable. Lorsqu'il existe plus de deux choix et qu'aucun choix ne reçoit une majorite nette au premier depouillement de votes,le choix recevant le moins de premieres preferences sera supprime,et les scrutins correspondants seront redistribues aux autres choix selon les deuxiemes preferences. Ce procede sera repete,employant autant de preferences que necessaire afin d'obtenir une majorite nette".

Cette motion a ete appuye par M.Kantey. Elle a ete favorablement reçue, mais plusieurs personnes etaient de l'opinion que certains changements etaient souhaitables et le Professeur Sinclair fut prie d'amener une version revisee pour consideration plus tard au cours de la seance.

14. Une proposition emanant de la Societe Nationale Suedoise que les regles de conduite d'une reunion soient simplifies n'a pas ete acceptee.

15. Le Professeur de Beer a propose,au nom de la Societe Nationale Suedoise,que les Statuts et Reglements soient imprimes en un seul document combine,et il a appuye

It was considered that the important distinction between the two could be blurred, and on the vote the motion was lost.

16 Dr Koenig reported on the work undertaken by the German National Society in producing Geotechnical Abstracts on behalf of ISSMFE. He pointed out that the service is now functioning fully and that any subscriber may now receive monthly a series of 144 literature abstracts taken from any of some 500 periodicals, but were it not for the generous underwriting by the Volkswagen Foundation of the loss each year the work would have to come to an end for lack of support. So far, the Foundation have advanced some $45,000.00 but they have placed the limit of their support at $90,000.00 or the end of 1972. Dr Koenig requested financial backing from ISSMFE to the extent of $24,000.00 for the year 1973.

Mr. Norup stated his view that with more vigorous promotion the abstracts should become a viable venture within 4 to 5 years from now. The ASCE(SMFD) has decided to discontinue its own abstract system and to adopt Geotechniqal Abstracts and this will undoubtedly be of assistance.

It was agreed that every National Society should try to increase the subscribers within their countries by a direct approach to firms and libraries not at present taking the abstracts. The accounts indicate that if the service is to be continued a rise in price may be necessary after 1972, possibly using a differential price for individuals as opposed to larger organisations.

The Secretary General pointed out that without a drastic rise in dues, the International Society could not possibly fund the Geotechnical Abstracts as requested by Dr Koenig. He had however had discussions with Dr Chamecki, Director of Research at UNESCO, about the possibility of getting support from that body, and it was agreed that a strong request should be made to this end through U.A.T.I.

It was agreed that the Abstracts were very good indeed and Mr Galloway proposed that National Societies should be urged to promote the sale of Geotechnical Abstracts in their countries. This was seconded by Dr Hilf and was carried unanimously.

cette proposition au nom de la Tchecoslovaquie. Il fut decide que la distinction importante entre les deux pourrait etre confuse, et apres avoir ete mise au vote, la motion a ete rejetee.

16. Le Dr.Koenig a presente son rapport sur les travaux entrepris par la Societe Nationale Allemande quant a la presentation des extraits geotechniques pour le compte de la S.I.M.S.T.F. Il a signale le fait que ce service fonctionne maintenant d'une façon entierement satisfaisante, et que tout abonne pourra recevoir mensuellement une serie de 144 extraits de litterature pris dans quelques 500 periodiques, mais sans la souscription generause annuelle par le Fondation Volkswagen de la perte, les travaux devraient cesser par manque d'appui. Jusqu'a present, la Fondation a avance quelques $45.000, mais elle a place la limite de son appui, soit $90.000, soit la fin de 1972. Le Dr.Koenig a demande a la S.I.M.S.T.F. une garantie financiere de $24.000 pour 1973.

M.Norup a exprime son avis qu'avec une promotion plus vigoureuse, les extraits devraient devenir une operation viable d'ici 4 ou 5 ans. ASCE(SMFD) a decide de discontinuer son propre systeme d'extraits et d'adopter les extraits geotechniques et ceci sera certainement d'aide appreviable.

Il a ete convenu que chaque societe nationale essaie d'augmenter le nombre des abonnes dans leur pays au moyen d'une approche directe a des societes et a des bibliotheques qui ne sont pas actuellement abonnes aux extraits.

L'etat des comptes fait ressortir que si ce service doit continuer, une augmentation de prix sera peut-etre necessaire apres 1972- peut-etre en employant un prix differentiel pour les individus par opposition a des organisations plus importantes.

Le Secretaire General a demontre que sans une augmentation rigoureuse de la cotisation, la Societe Internationale ne pourrait certainement pas financer les extraits geotechniques comme l'a demande le Dr.Koenig. Cependant, il a eu des entretiens avec le Dr.Chamecki, Directeur des Recherches a l'UNESCO, concernant la possibilite d'obtenir de l'aide de la part de cet organisme, et il a ete convenu qu'une demande tres appuyee soit faite a ces fins par l'intermediaire de l'UATI.

Il a ete convenu que les extraits etaient vraiment excellents et M.Galloway a propose qu'on insiste aupres des Societes Nationales pour qu'elles avancent la vente des extraits geotechniques dans leurs pays. Cette proposition a ete appuyee par le Dr.Hilf et a ete adoptee a l'unanimite.

The President drew attention to a proposed combined advertisement for the Abstracts and the Geodex Retrieval System which was distributed to delegates and this was given warm endorsement. Those who have used Mr Norup's system have found it to be excellent and it was recognised to be of great service to ISSMFE.

17. The Secretary General presented the accounts for the years ended 28th February, 1970 and 1971, and pointed out that a number of countries were in debt to the Society, one for as much as three years. These accounts are attached as Appendix I. Dr D'Appolonia considered that the Society was running on too fine a margin for the sort of activity which it ought to be undertaking, and the President agreed to set up a committee at the Moscow Conference to review the matter. The President proposed the adoption of the accounts and this was unanimously agreed.

18. The Secretary General introduced the sample page proposed for a new printed list of Members and suggested that the cost be reduced by accepting advertisements. After discussion the President proposed that the principle of advertisements in the list, under careful control, be adopted. This was generally agreed on the understanding that professional cards or advertising by consulting engineers be not included. The aim should be to reduce the costs and not to make a profit. It was further decided that degrees, etc. should not be given and that the address supplied should be the preferred mailing address.

Mr. Lumb said he believed that a considerable saving could be made if the printing were to be done in Hong Kong and it was agreed that this would be desirable if it could be arranged. The Southeast Asian Society offered its assistance in co-ordinating the effort and in proof reading with ISSMFE bearing the out-of-pocket expenses.

The Secretary General agreed to look into the matter in consultation with Mr. Lumb. It was also agreed that if it were found to be not much more expensive, a copy of the list should be mailed direct to each member.

It was also agreed that the list should be available to non-members for the price of $25.00.

Le President a attire l'attention des delegues sur un projet de publicite combinee pour les extraits et le systeme d'information Geodex. Ce projet a ete distribue aux delegues et a ete entierement approuve. Les personnes ayant deja emprunte le systeme de M.Norup,l'ont trouve excellent et il a ete reconnu comme etant d'une grande utilite a la SIMSTF.

17. Le Secretaire General a presente les comptes pour les exercices se terminant au 28 fevrier 1970 et au 28 fevrier 1971, et a attire l'attention des delegues sur le fait que certaines societes sont endettees envers la SIMSTF, une d'entre elles pour trois ans. Ces comptes sont donnes ci-joints a l'annexe I. Le Dr. D'Appolonia estime que la Societe joue d'une marge trop etroite pour le genre d'activites qu'elle devrait entreprendre, et le President a consenti a etablir, a la Conference de Moscou, un comite qui sera charge d'examiner cette question. Le President a propose que les comptes soient adoptes, et ceux-ci ont ete acceptes a l'unanimite.

18. Le Secretaire General a presente comme echantillon, une page de la nouvelle liste de membres proposee qui sera imprimee, et a propose que les frais entraines pour cette impression soient diminues par l'inclusion de pages publicitaires.

Apres discussions,le President a propose que le principe d'inclure des publicites dans la liste soit adopte,sujet a un controle suivi. Les delegues,en general, etaient d'accord avec cette proposition, a condition que ni des cartes professionelles, ni de la publicite par des ingenieurs-conseils ne soient inclus. Le but doit etre de diminuer les frais et non pas de faire des benefices. Il a ete egalement decide que les diplomes,etc., ne doivent pas etre indiques et que l'adresse y figurant devrait etre l'adresse postale habituelle.

M.Lumb a dit qu'il croyait que des economies considerables pourraient etre effectuees si les listes etaient imprimees a Hong Kong,et il a ete convenu que ceci serait souhaitable s'il etait possible de prendre les dispositions necessaires. La Societe Sud-Est Asiatique a offert son assistance en ce qui concerne la co-ordination de l'effort et la correction des epreuves, tant que ISSMFE subit les frais.

Le Secretaire General a accepte de se renseigner a ce sujet, en consultation avec M.Lumb. Il a ete egalement decide d'envoyer un exemplaire de la liste a chaque membre, a condition que le cout n'en soit pas trop eleve.

En outre,il a ete decide que la liste serait accessible aux non-membres de la societe pour un prix de $25.00.

19. Professor Davis introduced the report of the Conference Procedure Committee on behalf of its Chairman, Dr. D.H. MacDonald. This major report had been circulated in advance and the Committee, and Dr. MacDonald in particular, were warmly thanked for the work they had done, and the Committee was discharged. It was agreed that Dr Bjerrum's plan to set up this committee was good.

The payment to Authors for State-of-the-Art reports was discussed at length and the U.S.Delegates stated that their National Committee was opposed in principle to such payments and that the honour of being asked to undertake the task should be sufficient reward. Some supported this view but others felt that an honorarium ought to be available to help State-of-the-Art speakers in defraying expenses associated with the collection of information, such as postage, secretarial assistance or other technical help. No decision was taken on this matter.

The President referred to Paragraph 31 of the Constitution and drew attention to the problem of the host country in planning their programme whilst concurring with the wishes of the Executive Committee, which would not be known until rather a late date.

Dr.D'Applonia suggested that a Sessions Programme Committee should be set up by the Executive Committee to plan the topics and introductory speakers for the technical sessions. The Committee would work in conjunction with the Organising Committee of the host country.

Professor Trollope proposed that "this meeting recommends the setting up of a Conference Advisory Committee as outlined in the Report and commends the remaining contents of the Report as a guide to the conduct of future conferences." This was seconded by Professor de Beer and was carried unanimously.

Dr Hilf proposed that the National Societies should be consulted about the topics to be discussed at forthcoming conferences as suggested by the Spanish National Society. This was seconded by Mr.Kantey and the motion was unanimously carried, and it was suggested that this could be done at the Executive Committee meeting taking place at the time of the preceding International Conference.

19. Le Professeur Davis a presente le rapport du Comite de Procedure de la Conference au nom de son President, le Dr.D.H.MacDonald, Ce rapport important avait ete circule en avance. Les membres du Comite, et le Dr. MacDonald en particulier, ont ete chaleureusement remercies pour le travail qu'il avaient accompli,et le Comite a ete dissous. Il a ete convenu que Dr.Bjerrum a eu une excellente idee en creant ce comite.

La remuneration aux auteurs des rapports 'State-of-the Art' a ete longuement discutes. Les delegues d'Amerique ont declare que leur Comite National s'oppose, en principe,a de tels paiements et que l'honneur d'avoir ete invite a entreprendre ce travail devrait suffire en lui-meme. Certains, parmi les delegues, etaient de cet avis,mais d'autres considereraient qu'il devrait exister des honoraires pour aider les conferenciers 'State-of-the Art' a couvrir les frais relatifs au rassemblement des renseignements, tels que le port,travaux de bureau ou tout autre aide technique.Aucune decision n'a ete prise a ce sujet.

Le President s'est refere a l'article 31 des Statuts et a attire l'attention des delegues sur le probleme du pays hote en redigeant leur programme tout en tenant compte des desirs du comite executif desirs qui seraient inconnus jusqu'a une date assez avancee.

Le Dr. D'Appolonia a suggere qu'un comite de programmes de seances soit etabli par le comite executif afin de preparer les sujets et de choisir les conferenciers principaux pour les seances techniques. Ce comite travaillerait conjointement avec le comite organisateur du pays hote.

Le Professeur Trollope a propose qu " "cettre reunion recommande l'etablissement d'un comite de conference consultatif, comme il est indique dans le rapport, et que le reste du rapport soit pris comme guide pour les futures conferences".

Cette proposition a ete appuyee par le Professeur de Beer, et a ete adoptee a l'unanimite.

Le Dr.Hilf a propose que les societes nationales soient consultees au sujet des questions a discuter au cours de prochaines conferences,comme l'a suggere la societe nationale espagnole.Cette prpposition a ete appuyee par M.Kantey et a ete adoptee a l'unanimite. Il a ete suggere que ceci pourrait etre fait a la reunion du comite executif tenue a la meme epoque que la conference internationale precedente.

20. Further to Minute 13 Professor Sinclair laid before the Committee a revised version of the Canadian suggestion for a rewording of By-Law 12(ii) as follows:
"Voting shall in general be by a show of hands. However, for the election of the President, for the selection of the place of the next International Conference or Executive Committee Meeting, and for other matters specified at the time by the Chairman, voting shall be by secret ballot, with each eligible voter voting for one choice. When more than two choices are available, and none of the choices receives a majority of votes on the first ballot count, that choice receiving the fewest votes shall be deleted, and a second ballot conducted. The procedure shall be repeated successively, until one of the choices receives a majority of votes."
This was unanimously agreed.

20. Comme suite au paragraphe 13 ci-avant, le Professeur Sinclair a presente au Comite une version revisee de la proposition canadienne concernant le changement du reglement 12 (ii), comme suit:
"Le mode de votation aura lieu en general a mains levees. Cependant,pour l'election du President, pour le choix du lieu de la prochaine conference internationale ou d'une reunion du comite executif, et pour d'autres sujets specifies a ce moment-la par le President, un scrutin secret sera employe, chaque votant eligible ayant un seul choix. Lorsqu'il existe plus de deux choix et qu'aucun choix ne reçoit une majorite nette au premier depouillement de votes,le choix recevant le moins de votes sera supprime et un deuxieme scrutin aura lieu. Ce procede sera repete jusqu'a ce qu'un des choix obtienne une majorite des votes".

Cette modification a ete adoptee a l'unanimite.

21. Professor Tsytovich introduced the discussion on the draft Bulletin No.1 and dealt with the arrangements for the Main and Specialty Sessions. He suggested that Professor Peck should speak at the opening of the Conference and should make his Presidential Address at the beginning of the first Main Session. This would be followed by the General Reporter and then by discussion from the floor. There would be no panels. Each of the Past-Presidents would be invited to make a 10-minute comment before the summing up by the General Reporter, at a Session of his own choice.

The following had been invited to act:-

21. Le Professeur Tsytovich a ouvert la discussion sur le projet du Bulletin No.1 et a traite des dispositions concernant la seance principale et les seances specialisees. Il a suggere que le Professeur Peck adresse la seance inaugurale et qu'il presente son discours presidentiel au debut de la premiere seance principale. Ce discours serait suivi par celui du Rapporteur General et ensuite par la discussion entre delegues. Il n'y aurait pas de commissions. Chacun des anciens presidents serait invite a faire un commentaire d'une duree de 10 minutes (a la seance du son choix), avant le resume presentee par le Rapporteur General.

Les personnes suivantes furent invitées:

MAIN SESSION	CHAIRMAN	GENERAL REPORTER	CO-REPORTER
1.	Prof.Suklje (Yugoslavia)	Prof.Lambe (U.S.A.)	Prof.Vyalov (U.S.S.R.)
2.	Prof.de Beer (Belgium)	Prof.Gorbunov-Posadov (U.S.S.R.) and Prof.Davidov (U.S.S.R.)	Prof.Krosmonovic (Yugoslavia)
3.	Prof.Kézdi (Hungary)	Prof.Zeevaert (Mexico)	Dr.Trofimenkov (U.S.S.R.)
4.	Prof.Leonards (U.S.A.)	Dr.Bjerrum (Norway)	Mr.Tokav (U.S.S.R.)

SPECIALTY SESSION	CHAIRMAN	VICE CHAIRMAN	CO-VICE CHAIRMAN
1.	Mr.S.Wilson (U.S.A.)	Prof. Stefanoff (Bulgaria)	Mr.Baranov (U.S.S.R.)
2.	Dr.Poorooshasb (Iran)	Mr.Zavietski (U.S.S.R.)	-
3.	Prof.Nichiporovich (U.S.S.R.)	Mr.Gaziev (U.S.S.R.)	-
4.	Dr.Broms (Sweden)	Prof.Evdokimov (U.S.S.R.)	-
5.	Dr.Tchebotarioff (U.S.A.)	Prof.Klein (U.S.S.R.)	Prof.Malyshev (U.S.S.R.)
6.	Prof.Maslov (U.S.S.R.)	Prof.Bishop (U.K.)	-
7.	Prof.Cambefort (France)	Prof.Rzhanitsyn (U.S.S.R.)	Prof.Adamovich (U.S.S.R.)
8.	Prof.Kalissky (Poland)	Prof.Sinitsyn (U.S.S.R.)	

SPECIAL LECTURES

1.	Prof. Kerisel (France)	Bi-centenary of Coulomb's 1773 paper
2.	Prof. Tsytovich (U.S.S.R.)	Soil and Rock Mechanics in Geomechanics and outer space
3.	Prof. Scott (U.S.A.) Prof. Cherkasov (U.S.S.R.)	Lunar Soil Mechanics
4.	-	

The task of the Co-Reporter for the Main Sessions would be to brief the General Reporter in recent achievements in the field in the Soviet Union.

22. Dr. Trofimenkov reported on the arrangements proposed for the tours in conjunction with Intourist. These were to be to Leningrad (4 days, 96r.), the Black Sea (6 days, 149r.), Baku (7 days, 191r.), Taskent, Samarkand, etc (7 days, 234r.), Kiev (4 days, 100r.), and Bratsk (approx. 240r.). The tours would include visits to sites of soil mechanics interest: the cost in roubles includes shared accommodation, meals and transport.

23. The Secretary General spoke of his recent visit to Moscow and of the fine hall in the Kremlin in which the Opening Session is to take place, and of the assembly halls available in the University where the Technical Sessions are to be held.

He queried whether in reducing the number of Specialty Sessions to two per afternoon it was realised that there might be up to 600 persons attending these sessions and that the informal atmosphere could be lost.

24. Dr Hilf suggested that this could be partially overcome if the Organising Committee could make available a number of rooms where Authors who had submitted papers to the Conference could get together with interested persons to discuss topics of mutual concern. He further suggested that the Conference Advisory Committee referred to in minute 19 should be set up forthwith to discuss the names for General Reporters, etc., proposed by the Organising Committee, since it appeared that the distribution around the soil mechanics centres of the world was not very equitable.

25. Mr Kantey pointed out that no Reporters, etc. had been included from South America, Asia, Australia, New Zealand or Africa, and asked if these had been excluded for any special reason? Professor Tsytovich replied that the Organising Committee now found themselves with six places unfilled and that they would be glad to consider suggestions for speakers.

La tache du Rapporteur-adjoint durant les seances principales serait de renseigner le Rapporteur-General des accomplissements recents (aux U.R.S.S,) dans le domaine en question.

22. Le Dr.Trofimenkov a annonce les dispositions proposees pour les excursions arrangees par l'Intourist. Ces excursions seront a Leningrad (4 jours,96 r.), a la Mer Noire (r jours,149 r.), a Bakou (7 jours,191 r.), a Taskent, Samarkand etc.(7 jours,234 r.) a Kiev (4 jour, 100 r.), a Bratsk (environ 240 r.)

Ces excursions compredraient des visites a des lieux interessants,au point de vue de la mecanique du sol: le prix quote en roubles,comprend l'accommodation partagee, les repas et le transport.

23. Le Secretaire General a parle de sa recente visite a Moscou et de la salle magnifique dans le Kremlin ou la seance inaugurale aura lieu, ainsi que des salles a l'Universite ou les seances techniques auront lieu. Il s'est demande si les delegues se rendaient compte qu'en reduisant a deux, par apres-midi, le nombre de seances specialisees, il pourrait y avoir jusqu'a 600 personnes presentes a chaque seance, ce qui entrainerait l'absence de cette ambiance d'informalite.

24. Le Dr.Hilf a suggere que ce probleme pourrait etre surmonte en partie si le comite d'organisation pourrait mettre plusieurs salles a la disposition des delegues, ou les auteurs ayant soumis des papiers a la conference, pourraient se reunir avec des personnes interessees afin de pouvoir discuter des questions d'un interet mutuel.

Il proposa egalement que le comite de conference consultatif mentionne au paragraphe 19 soit etabli sans delai afin de pouvoir discuter les noms des Rapporteurs-Generaux,etc., proposes par le Comite d'Organisation puisqu'il semble que les centres de la mecanique du sol ne sont pas distribues a travers le monde de façon tres equitable.

25. M.Kantey a attire l'attention sur le fait qu'aucun Rapporteur,etc. de l'Amerique du Sud,de l'Asie, de l'Australie,de la Nouvelle-Zelande ni d'Afrique, n'avait ete nomme, et a demande s'il avaient ete exclus pour une raison speciale. Le Professeur Tsytovich a repondu que le Comite d'organisation se trouvait maintenant avec six places non remplies et que le Comite serait heureux de considerer des suggestions pour des conferenciers.

26. Dr Ishihara asked if the dates by which the summaries were required could be postponed by (say) two months, and many others supported this view. Professor Tsytovich pointed out that it was planned to distribute the first volumes of the Conference in May 1973 and he did not consider that the initial date for the final papers could be postponed, though the Summaries might be received up to two months later than the date originally stated.

27. Dr Ishihara pointed out that By Law 17 states that these Conferences are primarily intended for members of the International Society, and the Organising Committee were asked to alter the general invitation given in Draft Bulletin No.1 in the light of this By Law

28. Dr D'Appolonia asked if provision was being made for a family of (say) husband and wife and 16-year-old son to attend the Conference and whether the son could participate in the Conference tours, or if there were younger children whether provision could be made for them. Professor Trofimenkov thought that provided the children were old enough this would be in order and there would be functions for persons accompanying members or guests.

29. Professor Sinclair asked if students could be permitted to attend the Conference at reduced rates and not receiving proceedings. Professor Trofimenkov thought this should be possible.

30. The President suggested that he, the Vice-President for Europe and the Secretary General, as the present members of the Conference Advisory Committee, should get together with Professor Tsytovich and Professor Trofimenkov to discuss the many points which had been raised in the meeting.

31. The progress report of the Sub-Committee on Symbols and Definitions was received and it was agreed that it should be attached to the Minutes as Appendix II.

The Secretary General reported on discussions which he had had with Dr. Chamecki of UNESCO about the possibility of obtaining financial assistance in the production of a new edition of the Lexicon. He had had a favourable response, and it was agreed that a request should be submitted via U.A.T.I., once a financial estimate

26. Le Dr. Ishihara a demande si les dates, avant lesquelles les sommaires devraient etre soumis, pouvaient etre ajournes de deux mois peut-etre- et beaucoup d'autres delegues ont appuye cette opinion. Le Professeur Tsytovich a signale qu'il comptaient distribuer en mai, 1973, les premiers volumes de la Conference et qu'il ne considerait pas que la premiere date pour les papiers finaux pouvait etre ajournee, bien que les resumes pourraient etre reçus jusqu'a deux mois plus tard que la date deja declare.

27. Le Dr. Ishihara a attire l'attention des delegues sur le fait que le reglement 17 declare que ces conferences sont essentiellement a l'intention des membres de la Societe Internationale et les membres du Comite d'Organisation ont ete pries de bien vouloir modifier l'invitation generale lancee dans le projet de bulletin No.1.

28. Le Dr. D'Appolonia a demande si des dispositions avaient ete prises pour qu'une famille comprenant, par exemple, le mari, la femme et un fils de 16 ans, puisse assister a la Conference, et si le fils pourrait participer aux excursions. Il a egalement demande si des dispositions pourraient etre prises en cas d'enfants plus jeunes. Le Professeur Trofimenkov estimait qu'a condition que les enfants soient assex grands, ceci serait acceptable, et il y aurait des fonctions pour les personnes qui accompagnent les invites.

29. Le Professeur Sinclair a demande si des etudiants pourraient assister a la conference a un tarif reduit, sans recevoir les proces-verbaux. Le Professeur Trofimenkov estimait que ceci devrait etre possible.

30. Le President a suggere que lui-meme, le Vice-President de l'Europe et le Secretaire General, comme membres actuels du comite de conference consultatif, devraient se reunir avec le Professeur Tsytovich et le Professeur Trofimenkov afin de discuter les nombreuses questions soulevees au cours de la reunion.

31. Le rapport de l'etat de travaux du sous-comite sur les symboles et definitions a ete reçu et il a ete convenu que ce rapport soit annexe aux proces-verbaux comme l'Annexe II.

Le Secretaire General a fait un rapport sur les entretiens qu'il a eus avec le Dr. Chamecki de l'UNESCO concernant la possibilite d'obtenir de l'aide financiere pour la production d'une nouvelle edition du Lexique. Il en a eu une reponse favorable et il a ete convenu qu'une demande soit soumise par l'inter-

was available.

32. Dr. Aitchison reported on the work since the Mexico Conference of the Committee on Soil Sampling. The Committee now has the following membership:

Dr G.D. Aitchison	Australia (Convener)
Prof. H. Mori	Japan
Dr B. Broms	Sweden
Prof. J.O.Osterberg	U.S.A.
Dr M.J.Hvorslev	U.S.A.(Adviser)
Mr M. Wood	Australia (Secretary)
Dr Ing. Heinz Muhs	W.Germany

The report of the Specialty Session at the Mexico Conference was now out of print. A further Specialty Session on soil sampling took place at the recent Fourth Asian Regional Conference at Bangkok and the papers from this symposium would be published.

A further symposium was planned to take place about the time of the Moscow Conference.
Dr. Aitchison outlined the relationship between his committee and the larger IGOSS (International Group on Soil Sampling) and the President queried whether or not the Sub-Committee ought to be discharged, possibly at the time of the Moscow Conference, in favour of the larger group.
Dr Aitchison considered that the focus given by the ISSMFE group was important and considered that the link between IGOSS and ISSMFE was essential. In a sense, the Sub-Committee acted as an executive committee for the IGOSS group: nevertheless, the Sub-Committee's work was nearing completion and should produce a final report in 4 to 5 years.

Dr Aitchison's report was accepted with thanks.

33. The President mentioned that ancillary conferences were being contemplated in one or two centres prior to the Moscow Conference. In general it was agreed that any opportunity for Soil Mechanics workers to get together should be encouraged. Dr Hilf mentioned that the Texas symposium prior to the Mexico Conference was not found to have detracted in any way from the Mexico Specialty Session and provided the Organising Committee had no objections then any ancillary conference should be encouraged.

34. The President reported that continuing co-operation was taking place between ourselves and other international societies and bodies. We have been

mediaire de l'U.A.T.I., une fois qu'un devis des couts soit disponible.

32. Le Dr.Aitchison a presente un rapport sur le travail du Comite sur l'echantillonage des sols depuis la Conference de Mexique. Le Comite comprend actuellement les membres suivants:

Dr.G.O.Aitchison	Australie (membre charge de convoquer)
Professeur H.Mori	Japon
Dr.B.Broms	Suede
Professeur J.O.Osterberg	U.S.A.
Dr.M.J.Hvorslev	U.S.A.(Conseiller)
M.M.Wood	Australie (Secretaire)
Dr-Ingenieur Heinz Muhs	Allemagne Federale

Le rapport de la seance specialisee de la Conference de Mexique etait a l'heure actuelle, hors de circulation.Une autre seance specialisee sur l'echantillonage des sols a ete tenu recemment au cours de la quatrieme Conference Regionale d'Asie qui a eu lieu a Bangkok, et les papiers resultant de ce colloque seraient imprimes.
Une autre colloque etait projete pour environ l'epoque de la Conference du Moscou.

Le Dr.Aitchison a expose le rapport entre son comite et le plus grand GISES (Groupe International sur l'Echantillonage des Sols), et le President s'est demande si le sous-comite devrait etre dissous, peut-etre a l'epoque de la Conference de Moscou, en faveur du plus grand groupe.

Le Dr.Aitchison etait de l'avis que l'accent donnee par le groupe SIMSTF est important et le rapport entre le GISES et la SIMSTF,essentiel.Dans un sens, le sous-comite jouait le role de comite executif pour le groupe GISES: neanmoins, les travaux du sous-comite approchaient a leur fin et le comite devrait sortir leur rapport final d'ici 4 a 5 ans.

Le rapport du Dr.Aitchison a ete agree avec remerciements.

33. Le President a mentionne que des conferences ancillaires etaient envisagees dans un ou deux centres avant la conference de Moscou. En general,il etait convenu qu'on devrait favoriser toute occasion a laquelle les specialistes en la mecanique du sol pourraient se reunir.

Le Dr.Hilf a mentionne que le colloque de Texas qui a eu lieu avant la conference de Mexique n'avait pas nuit a la Seance specialisee de Mexique,et a la condition que le comite d'organisation n'y voyait aucun inconvenient,toute conference ancillaire etait a encourager.

34. Le President a declare qu'une cooperation continue existait entre nous-memes et d'autres associations et organismes inter-

represented on two UNESCO working parties (at UNESCO expense). The President had had discussion with Dr Obert of ISRM and the Secretary General had been in correspondence with the Secretary General of the International Association for Engineering Geology.

35. The Secretary General reported that during his recent visit to Moscow he had had discussions with Professor Ganichev concerning any difficulties which might arise over the issue of visas to those planning to attend the Moscow Conference.

The reply was that provided the person was a listed member of the International Society and his country had diplomatic relations with the Soviet Union, then the person would obtain a visa. For other listed members (and other interested persons), provided an invitation was sent to the person to attend the Conference by the Secretary General, with a copy to the Conference organisers, several months in advance of the Conference, then there should be no difficulty in their being granted a visa.

36. Professor Sinclair moved a vote of thanks to our Australian hosts for their generous hospitality and excellent arrangements for this meeting.

The meeting concluded at 18.55 with a vote of thanks to the President and Secretary General.

Signed in and on behalf of the Executive Committee

Ralph B. Peck
President

nationaux. Nous avons ete representes a deux comites de travail de l'UNESCO (aux frais de l'UNESCO). Le President a eu des entretiens avec le Dr. Obert de la S.I.M.R. et le Secretaire General a ete en rapport avec le Secretaire General de l'Association Internationale de la Geologie du Genie Civil.

55. Le Secretaire General a declare qu'au cours de sa recente visite a Moscou il a eu des entretiens avec le Professeur Ganichev au sujet des difficultes qui pourraient surgir quant a l'emission de visas pour ceux qui souhaiteraient assister a la conference de Moscou.

La reponse etait qu'a condition que la personne soit un membre enregistre de la Societe Internationale et que son pays ait des relations diplomatiques avec l'Union Sovietique, cette personne obtiendrait un visa. Pour d'autres membres enrigistres (et d'autres personnes interessees), a la condition qu'une invitation a assister a la Conference soit envoyee par le Secretaire General a cette personne plusieurs mois avant la Conference, avec une copie aux organisateurs de la Conference, il n'y aurait aucune difficulte dans l'obtention d'un visa.

36. Le Professeur Sinclair a exprime un vote de remerciements a nos hotes australiens pour leur hospitalite genereuse et l'excellente organisation de cette reunion.

La reunion a termine a 18h.55 avec remerciements aux President et Secretaire General

Signe au nom du Comite Executif

Ralph B. Peck,
President

INTERNATIONAL SOCIETY FOR SOIL MECHANICS AND FOUNDATION ENGINEERING

INCOME AND EXPENDITURE 1970 - 1971

Years ended 28th February:

	1970 $	1971 $
RECEIPTS:		
Carried forward	9,405.57	9,019.58
Subscriptions (including arrears)	12,956.97	7,641.58
Bank Interest	351.70	-
	$22,714.24	$16,661.17
EXPENDITURE:		
List of Members	11,397.11	-
U.A.T.I.	160.54	163.98
Mexico Exec.Committee	1,458.19	-
Central Office	678.81	3,015.51
	$13,694.66	$3,179.49
Balance forward	$9,019.58	$13,481.67

REPORT OF SUB-COMMITTEE ON SYMBOLS AND DEFINITIONS

1 Introduction

The present sub-committee continues the work of the previous sub-committee which was under the chairmanship of Professor Kerisel. The previous sub-committee completed the list of symbols and definitions which is printed in the 3rd edition (1967) of the eight language lexicon of "Technical Terms, Symbols and Definitions" published by the Swiss Society.

The present members of the sub-committee are:

Dr. L.F. Cooling	- Great Britain
Dr. H.Q. Golder (Chairman)	- Canada
Mr. A.I. Johnson	- U.S.A.
Dr. L. Jurgenson	- U.S.S.R.
Mr. E. Sandegren	- Sweden
Mr. Ch. Schaerer	- Switzerland
Prof. E. Schultze	- W.Germany
Dr. G. Ter-Stepanian	- U.S.S.R.

2 Specialty Session No.11 Mexican Conference

The work of the new sub-committee really started with the organization of the Specialty Session on 'Terminology' at the International Conference in Mexico in 1969. This session was chaired by Prof. Kerisel, the writer acting as secretary.

A very short report on this session was written for inclusion in the Proceedings of the conference. Later a transcript of the tape recording of the session was made and a copy was offered to everyone who was present at the session or who had corresponded with the secretary about the session. Copies of this transcript are still available.

Several matters arising from the session are still to be discussed by the sub-committee. These are listed below under "Future Work".

3 Lexicon

The eight language lexicon, produced through three editions by the Swiss National Society is a major contribution to our subject.

Several workers have pointed out however that some of the translations are not correct in all languages. In many cases this arises because the English word has more than one meaning. One of the tasks of the sub-committee is to correct these ambiguities and at the same time to add further technical words to the word list.

It has been agreed by the members that

a) words which are non-technical, or which can be found in any general dictionary should be deleted e.g. abrupt, acid.

b) where related words are listed, they should be listed together and marked as 'noun' 'verb' or 'adjective'

e.g.

absorb	- v
absorption	- n
absorbent	- a.

c) where the English word can be misunderstood or has two or more meanings it should be defined in English. The definition should be translated into the other languages and the appropriate word chosen.

e.g.

aeolian 'a'	- formed by wind action
aggregate 'n'	- mineral particles used to make concrete

d) new words should be considered from closely related disciplines, or arising from new techniques.
e.g. adobe, argillite, acoustic.

It has taken some time to arrive at these ground rules. The existing word lists are now being circulated letter by letter to all members for their comments. When these are received they are correlated on a special form. The chairman's recommended action based on majority opinibn (or on the opinion of the member who speaks a particular language) is added and the list is sent out again for comment or objections. Letter A is practically finished, B, C and D are ready for final circulation. The last letters sent out took us up to L. Now that the method of operation is working it is hoped to proceed more quickly with the remainder of the alphabet.

The executive committee is asked to consider the advisability, timing, finance and organization of a possible fourth edition of the lexicon.

4 S.I. Système International

A matter clearly within the duties of the sub-committee, and which was first raised by Dr. Northey of New Zealand, is which system of units should be used by the International Society. Dr. Northey pointed out that when New Zealand, Australia and Great Britain changed from the foot, pound, second (f.p.s.) system they would use the 'Système International' (S.I.). This is not the same as the centimetre, gram, second (c.g.s.) or the metre, kilogram, second (M.K.S.) systems used by most countries which have used the metric system of units for years. There are two differences. In the S.I. the kilogram is used as a unit of mass, and the Newton is the unit of force (and therefore comes into the units of stress and pressure), a Newton being that force which will give a mass of one kilogram an acceleration of one metre per second per second. The second difference is that the S.I. uses multipliers of 10^3 and 10^{-3} to move from one unit to the next greater or smaller

e.g. 1 kilogram = 1 gram x 10^3
1 metre = 1 mm x 10^3.

Our society must adopt some standard (if interim) policy on the use of units.

A letter was circulated to the Chairman of all National Committees asking what the situation was or was likely to be in their country. Sixteen replies were received one of which was simply a formal acknowledgment.

Two countries state unequivocally that they are now using S.I. only. They are Britain and Ireland. Poland states that S.I. will be obligatory after 1972.

Six countries are committed to S.I. but with reservations and six countries which are already 'metric' state that they have no intention of changing their present practice in the near future, i.e. they will continue to use c.g.s. or M.K.S. with force measured in kgf or kiloponds or metric tonnes and pressure in kgf/cm^2 or tonnes/m^2.

The reservations referred to above are of interest. Spain says S.I. is legal and is to be taught in schools, but c.g.s. and m.kp.s units are also compatible with the law. Spain refers to c.g.s. as only "a subsystem of the S.I." I do not think this is basically true. France suggests giving both units on graphs and also expresses a preference for the 'bar' as a unit of pressure, one bar being equal to one decanewton per cm^2. West Germany says S.I. units must be used by law from 1977, but refers to the difficulty of finding 'handy multipliers for the basic unit 'Newton' which should be such as to give conventional figures in conventional statical computations', and says 'Another point, of course, will be how readily engineers will accept new units'. South Africa is committed to S.I. and "will be completely metricated by the end of 1973", - they say further however "it is considered by the engineering profession that in practice, for the foreseeable future engineers will use kilograms for force and kg/cm^2 or tonnes/m^2 for stress". New Zealand agrees that S.I.units should be promoted, but points out that the use of a given system of units is really a matter of personal preference and that all a society can do is to recommend the S.I. units to its members. Portugal says that the tendency in their country is to maintain S.I. and derived units like kilograms force and kgf/cm^2 and ton/m^2.

Of those countries which will remain M.K.S. (i.e. NOT S.I.), Turkey does not expect a change in the near future, Hungary is deliberately using c.g.s. and M.K.S. units and awaits the introduction of "Newtons" and everything that has to come along with that. Finland will continue to use the c.g.s. system for the time being but expects the new generation will automatically shift over to S.I. as does U.S.S.R. Czechoslovakia uses S.I. with "one important deviation", which is that supplementary units are used in Civil Engineering practice. These are pond, kilopond and megapond for force and kp/cm^2 and Mp/m^2 for pressure, and p/cm^3 and kp/m^3 for unit weight. Japan and Greece see no sign

of change from the c.g.s. and M.K.S. systems.

The picture for the future is one of confusion. Clearly we are going to have with us in Civil Engineering both the S.I. and M.K.S. system for some considerable time in the future. One problem is the size of the Newton (which is small), the 10^3 multiplier, which becomes 10^6 for areas and 10^9 for volumes and the need to find a conveniently sized S.I. unit for force and stress. This will probably evolve with practice over a period of years.

One fact is clear; only North America is now using the f.p.s. system and Canada is committed to change to the S.I. Further the metric system has been legal in U.S.A. since 1866 and the metre and kilogram have been the legal standards of length and mass since 1893.

Recommendation

The sub-committee recommends to the executive committee that the f.p.s. system not be used in the activities of the International Society in future, but that all quantities be given in the S.I. or M.K.S. units. In the case of force or pressure, as an interim, measure, both S.I. and M.K.S. units be given, but 'Kilogram' should not be used as a unit of force, 'kilogram weight' or 'kilopond' being used. 'Bar' as a unit of pressure is acceptable.

5 Future Work

Listed below are subjects which have been brought to the attention of the sub-committee and with which it is hoped to deal in the next two years.

a) Ambiguity in the terms 'modulus' and 'co-efficient', 'modulus' having dimensions and 'co-efficient' being a dimensionless number.

b) Desirability of correlation of terms used with similar terms in other disciplines e.g. heat flow and seepage; rheology.

c) Standardization of grading curves.

d) Use of cu and su.

e) Co-ordination of terminology with other associations.

H.Q. Golder
Chairman
Sub-Committee on Symbols
and Definitions

INTERNATIONAL SOCIETY FOR SOIL MECHANICS AND FOUNDATION ENGINEERING

MINUTES OF THE EXECUTIVE COMMITTEE MEETING HELD IN MOSCOW

2nd, 3rd August, 1973

09.00-14.00 and 15.00-17.00 each day

PRESENT

President	Prof. R.B. Peck	
Vice-Presidents	-	Africa
	-	Asia
	Prof. E.H. Davis	Australasia
	Prof. E.E. de Beer	Europe
	Dr. D.H. Macdonald	N.America
	-	S.America
Secretary General	Prof. J.K.T.L. Nash	

National Society	Voting Representative	Non-Voting Representative
Argentina	-	
Australia	V-P	
Austria	Dr.M. Fross	
Belgium	V-P	
Brazil	Mr. S. Golombek	
Bulgaria	Prof. G. Stefanoff	
Canada	Mr. C. Crawford	Prof. G. Meyerhof
Chile	-	
China	-	
Colombia	-	
Czechoslovakia	delegate of Hungary	
Denmark	-	
Ecuador	-	
Finland	delegate of Sweden	
France	Prof. J. Kerisel	
G.D.R.	Prof. W.W. Rattay	Mr. Bittniok
German Federal Republic	Dr. H.W. Koenig	Dr. I.H. Idel
Ghana	-	
Greece	Prof. D. Valalas	Mr. D. Frankidakis
Hungary	Prof. A. Kézdi	
India	Prof. S. Prakash	Prof. D. Mohan
Iran	-	
Ireland	-	
Israel	-	
Italy	Prof. A. Croce	Prof. C. Viggiani
Japan	Prof. M. Fukuoka	Prof. Y. Yoshimi
Mexico	Dr. B. Simpser	
Morocco	-	
Netherlands	-	
New Zealand	Mr. M.J. Pender	
Norway	delegate of Sweden	
Pakistan	-	
Peru	-	
Poland	Prof. Z. Wilun	Dr. W. Wolski
Portugal	Mr.Castel-Branco Falcao	
Rhodesia	-	
S.Africa	-	
S.E. Asia	Dr. J. Nelson	Prof.Chin Fung Kee
Spain	Prof. J.A. Jiminez Salas	Mr. V. Escario
Sweden	Dr. B. Broms	Mr. N. Flodin
Switzerland	Dr. B. Gilg	
Tunisia	-	
Turkey	Prof. Togrol	
U.K.	Mr. A.C. Meigh	Dr. A. Penman
U.S.A.	Dr. E. D'Applonia	
U.S.S.R.	Prof. N.A. Tsytovich	Yu. G. Trofimenkov

National Society	Voting Representative	Non-Voting Representative
Venezuela	-	
Yugoslavia	Prof. I. Sovinc	

In addition the following were invited to attend all or part of the meeting and were present as observers:

The Secretary General of the International Association of Engineering Geology (Dr. Wolters)

Prof. Za-Chieh Moh (Vice-President elect)
Prof. R.J. Marsal (Vice-President elect)

In opening the meeting the President, Professor Peck, spoke of the tragic loss to the Society since our last meeting of the immediate Past-President, Dr. Laurits Bjerrum, and he asked members to stand in silence in his memory.

En ouvrant la séance Prof. Peck, Président, a parlé de la perte tragique pour la Société de son ex-Président, Dr. Laurits Bjerrum, et il a invité l'assistance à la commémorer par une minute de silence debout.

1. Apologies for absence were received with regret from the Vice-Presidents of Africa (Mr.dos Santos), Asia (Prof.Mogami) and South America (Mr.Perez Guerra).

1. Ont été reçues des excuses de la part des Vice-Présidents d'Afrique (Mr. dos Santos), d'Asie (Prof. Mogami) et d'Amérique du Sud (Mr. Perez Guerra).

2. A roll was taken of the various countries present which at the start of the meeting amounted to 17 and it was established that there were sufficient for a quorum for general business to be conducted (one-third necessary).

2. Vers le début de la première séance étaient présents les représentants de dix-sept pays, et il a été reconnu que le quorum (un tiers) étaient atteint.

3. The Secretary General reported that following the Sydney Executive Meeting (see Minute 4, Sydney) full application papers had been received from Ghana and, these being acceptable, Ghana had been accepted into membership. Ghana was formally welcomed as a new member as from 1st September 1972.

3. Le Secrétaire Général a rapporté que selon la résolution de la séance du Comité Exécutif tenu a Sydney (v.procés verbal N.4, Sydney), le Ghana est devenu membre de l'association à partir du 1 septembre 1972.

4. The Secretary General reported that following the Sydney meeting (see Minute 5, Sydney) he had been twice to Iran for discussions and that complete application papers had been received from the Iranian Geotechnical Society. He reported that these were in order, and Mr. Crawford proposed and Prof.de Beer seconded that Iran should be accepted into membership. This was adopted unanimously.

4. Le Secrétaire Général a informé le Comité que selon la décision du Comité Exécutif tenu à Sydney (v.procès verbal N.5, Sydney), il à été en Iran a deux reprises, pour discussions et présentation des doduments nécessaures. La documentation de la Société Géotechnique Iranienne est en ordre. M.Crawford a proposé et le Prof. de Beer l'a soutenu, l'admission de lIran au sein de la Société. Le vote a été unanime.

5. The Secretary General reported that following the Sydney Executive Committee Meeting he had sent a circular letter to each National Society asking for authority to be assigned to him to admit new countries into membership provided the overall requirements of the International Society appeared to have been met.

The replies were as follows;

5. Le Secrétaire Général a indiqué qu'il avait anvoyé une lettre à toutes les Sociétés Nationales concernant une délégation à lui d'admettre de nouveaux pays à la Société Internationale.

Il a reçu les réponses suivantes:

Quantité totale des pays informés	43
Pour	31
Contre	1

Total number of countries circulated		43
In favour of designating right of admission to Secretary General	31	
Not in favour	1	
In favour of designating right for admission of Ceylon	1	
No replies received	10	
	43	43

It was proposed by Dr. D'Applonia and seconded by Prof.de Beer that the Secretary General should continue to have this right for the next two years. This was accepted unanimously.

6. The Secretary General reported that he had had discussions in Budapest and in Dresden with the Officers of the G.D.R. Society of Soil Mechanics about their joining the International Society and that subsequent to the excellent symposium which they had run in Dresden a formal application had been received. This was fully in order and on the recommendation of Prof. Stefanoff, seconded by Prof.de Beer the G.D.R. National Society was unanimously accepted into membership.

7. The Secretary General reported that he had received an application for membership from Pakistan. The papers had been beautifully presented and on the proposal of Prof.de Beer seconded by Prof. Prakash it was unanimously agreed that Pakistan should be admitted as a new member.

8. The Secretary General reported that during 1971 he had received an application for membership from Ceylon. The papers had been well produced but he had written for clarification of a few points. No reply to his subsequent letters had been received and the application was therefore deferred.

9. The Secretary General reported that he had very recently received an application for membership from Romania. There were some queries arising from this application which had still to be answered and it was agreed that the right of admission should be delegated to the Secretary General as in Minute 5.

10. The Secretary General reported that he had recently received an application from Tunisia. The papers were in correct order and on the proposal of Mr. Pender, seconded by Prof. de Beer, it was unanimously agreed that Tunisia should be admitted as a new member.

Pour l'admission de Shri Lanka (Ceylon)		**1**
Pas de réponses		**10**

Le Prof. D'Apollonia a proposé et le Prof. de Beer l'a soutenu, de donner un tel droit au Secrétaire Général pour les deux ans à venir.
Adopté à l'unanimité.

6. **Le Secrétaire Général a indiqué qu'il avait du des négociations avec les dirigeants de la Société Nationale de la R.D.A. à Budapest et à Dresde au sujet de l'admission de cette Société à l'SIMSTP. La demande d'admission a été formulée.**
La demande étant formulée correctement, sur la recommendation du Prof. Stéfanov soutenue par le Prof. de Beer, la Société Nationale de la R.D.A. a été admise à l'unanimité.

7. **Le Secrétaire Général a rapporté qu'il avait reçu la démande de Pakistan. Les documents étaient en bon ordre, et, sur la proposition du Prof. de Beer soutenue par le Prof. Prakash, il a été décidé à l'unanimité d'admettre le Pakistan à la Société Internationale.**

8. **Le Secrétaire Général a annoncé qu'en 1971 il avait recç la demande analogique de Ceylan. Les papiers étaient en bon ordre, mais il avait demandé une explication écrite de certains points. Il n'a recç aucune réponse, et la demande du Ceylan a été ajournée.**

9. **Le Secrétaire Général a annoncé que la demande de l'admission de Roumanie avait été récemment reque. Dans cette demande, il y a certains points à préciser. Il a décidé conformément au point 5 ci-dessus, de donner le droit de résoudre la question de l'admission au Secrétaire Général.**

10. **Le Secrétaire Général a rapporté qu'il avait récemment reçu la demande de la Tunisie. Les papiers sont en bon ordre, et sur la proposition de M.Pender, soutenue par le Prof. de Beer, il été unanimément décidé que la Tunisie serait admise. A été admis, par ailleurs, le Pakistan. Par contre, l'admission de Ceylan a été ajournée.**

11. The Secretary General introduced the report (Appendix I) on the list of Members prepared by Mr. Peter Lumb of the South East Asian Society of Soil Engineering. The quality of the list was generally approved and a special vote of thanks was passed to those who had worked so hard to produce it.

Prof. Davis suggested that titles would be a great help in a future list and it was agreed that one title only (e.g. Mr or Dr or Professor, etc., but not more than one) should be used, the choice being left to the person concerned.

Dr. D'Appolonia urged that in order to help the finances of the Society the use of advertisements should be increased for the next list and that this should include

(i) Professional cards
(ii) Manufacturers of equipment
(iii) Sub-professional services (drilling, exploration, laboratory testing, etc).

Prof. Kerisel considered that since professional advertising was not permissible in some countries it should first be checked that any group would not be placed at a disadvantage and that the Professional cards would have to be produced according to an agreed standard. Professor Tsytovich considered that the question of advertisements should be taken very seriously and that they should be approved by National Societies before submission for the list. Dr. Croce queried if the Society would be responsible for the accuracy of the statements made in the advertisements and it was agreed that this would not be so.

It was unanimously agreed that a sub-committee should be appointed by the President to report to the next Executive Committee on the use of Professional cards.

12. It was agreed that the next list should be produced in 1976. Dr. Nelson stated that the S.E. Asian Society of Soil Engineering would be happy to serve the International Society by producing the list should their prices still be competitive. Prof. Prakash indicated that the Indian Geotechnical Society would also be happy to produce quotations and samples and the Secretary General was asked to follow these offers at the appropriate time. Dr. Simpser suggested that the use of a computer and photo reduction techniques should also be considered and this was agreed.

It was also agreed that substantially more copies of the list should be

11. Le Secrétaire Général a présenté le rapport sur la Liste des membres préparée par M.Lumb de la Société d'Asie Sud-Est. La qualité de ce travail e été reconnue. Par un vote spécial, on a remercié tous ceux qui avaient travaillé d'arrache-pied a son élaboration (Voir l'annexe 1).
Le Prof. Davis éstime que l'indication des grades serait utile dans la liste prochaine.
Il a été convenu de ne mentionner qu'un seul titre (c'est-à-dire, soit M., soit Dr., soit Prof., etc. mais pas plus d'un), le choix du grade revenant au titulaire lui-même.
Afin d'améliorer la situation financière de la Société, le Dr. D'Apellonia a proposé d'avoir recours plus largement à la publicité dans la liste prochaine qui comprendrait.

(i) cartes professionnelles
(ii) producteurs d'équipements
(iii) services sub-professionnelles (forage, exploration, essais en laboratoire, etc.)

Comme la publication des cartes professionnelles n'est pas permise dans certains pays, le Prof. Kerisel estime que cette possibilité doit être d'abord vérifiée afin qu'aucun groupe de pays ne soit desavantagé et que les cartes professionnelles soient préparées selon une forme convenue.
Le Prof. Tsytovitch considère que cette question doit être sérieusement controlée et approuvée par les Sociétés Nationales avant introduction dans la liste.
Le Dr Croce a demandé si la Société serait responsable de l'exactitude des données communiquées, et il a été décidé que non. Il a été unanimement agréé que le Président doit désigner un Sous-Comité pour préparer un rapport au Comité Exécutif prochain sur la possibilité d'introduction des cartes professionnelles.

12. On a décidé que la liste prochaine est à publier en 1976.
Le Dr. Nelson a déclaré que la Société des Travaux de Fondations d'Asie Sud-Est serait heureuse de rendre service à la Société Internationale en préparant cette liste.
Le Prof. Prakash a indiqué que la Société Géotechnique Indienne tiendrait aussi pour une tâche agréable de réaliser un certain travail pour cette liste.
On a prié le Secrétaire Général d'en tenir compte en temps utile.
Le Dr. Simpser a proposé d'utiliser aussi l'ordinateur et les techniques de photoréduction.
On a considéré utile pour la prochaine fois d'augmenter substantiellement la quantité de tirages de la liste afin

produced next time to allow for an increase in members and for sending to potential advertisers and the Secretary General was asked to take this into account when the next list is produced. It would also be appropriate to advertise the list so that Universities and firms can purchase copies.

13. The Secretary General mentioned that discussions had been taking place about co-operation with the International Society for Rock Mechanics (ISRM) and the International Association of Engineering Geology (IAEG) and one topic which had been discussed by the Secretaries General was the production of a common list of members with appropriate designations. This was discussed briefly and some of those countries who have combined ISSMFE and ISRM National Societies considered that this would be helpful, though others felt the list might be rather cumbersome. It was agreed that for the present each Society should proceed with its own list but the Secretary General was encouraged to continue the discussion with ISRM and IAEG on the matter.

14. The Secretary General introduced the Statement of Income and Expenditure for the two years ended 28th February 1973 which was circulated in advance with the Agenda and is reproduced as Appendix II. The President proposed the adoption of the report and this was accepted unanimously.

15. The President informed members that in accordance with Minute 17 of the Sydney Executive Committee meeting he had set up a sub-committee to consider the finances of the Society. This consists of Dr. D'Appolonia (Chairman), Prof. Kerisel and Prof.Prakash, and he invited Dr. D'Appolonia to introduce their report.

In introducing the discussion Dr. D'Appolonia spoke of the various methods used by other Societies to assess their dues and he referred to the fact that small and less wealthy countries would find it much more difficult unless a flat per capita membership fee were adopted. The sub-committee suggested that the amount of the annual dues should be determined by adding together the three following sums which would be calculated separately for each member country, depending on the classification of the member country.

1. A sum per member country computed as a percentage, p_1, of the budget and equally divided among the member countries.

de tenir compte de l'accroissement des membres et le Secrétaire Général a été prié de prendre ceci en considération au cours de la préparation de la liste prochaine.
Il serait aussi raisonable de diffuser cette liste aux Universités et aux firmes industrielles.

13. Le Secrétaire Général a annoncé qu'une discussion sur la coopération avec la Société Internationale de Mécanique des Roches (ISRM) et l'International Association of Engineering Geology (IAEG) avait eu lieu. Les trois Secrétaires Généraux ont négocié la question d'une liste commune qui comprendrait les diverses appartenances.
Il s'est avéré que certains pays faisant partie de l'SIMSTF et de l'ISRM trouvaient cette liste souhaitable tandis que d'autres ne partageaient pas cette opinion. Il a été décidé que, pour le moment, chaque Société présentera sa propre liste, et on a recommandé au Secrétaire Général de continuer la discussion sur ce sujet avec l'ISRM et l'IAEG.

14. Le Secrétaire Général a présenté le rapport sur les recettes et les dépenses des deux années écoulées au 28 février 1973. Il a été joint au procès-verbal et distribué; il est réproduit dans l'annexe II. Le Président a proposé d'adopter le rappert et le voto a été unanime.

15. Le Président a informé le Comité que conformément au procès-verbal (17) de la séance de Sydney, il avait désigné un Sous-Comité comprenant le Dr.Apollonia (Président), le Prof. Kerisel et Prof. Prakash afin d'étudier les finances de la Société. Le Président a invité le Dr. D'Apollonia a prendre la parole. Il propose que les cotisations soient calculées ainsi:

1. Un montant par Société Nationale affiliée calculé comme un pourcentage p_1 du budget, et réparti uniformément par Société Nationale affiliée.
2. Un montant variable par Société Nationale affiliée et calculé comme le produit d'un pourcentage p_2 du budget avec le pourcentage du nombre de membres de la Société Nationale affiliée au nombre total de membres de toutes les Sociétes Nationales affiliées.
3. Un montant variable par Société Nationale affiliée, calculé comme le produit d'un pourcentage p_3 du budget avec le coefficient d'importance de chaque pays affilié, com-

2. A variable sum per member country computed as a percentage, p_2, of the budget times the percent of number of members per member country to the total number of members of member countries.

3. A variable sum per member country computed as a percentage, p_3, of the budget times the percent rating of the member country as determined by the World Bank's Gross National Product per capita rating of the member countries.

4. The percentages, p_1, p_2 and p_3 of total annual budget should be set by the Committee.

and possible ways of interpreting this were shown in 3 tables.

Prof. Prakash pointed out that the 1965 increase from US$ 0·25 to US$ 0·75 per member had brought about a drastic drop in the membership of the Indian National Society and a further increase might well reduce our overall membership.

Dr. Nelson enquired if the question of institution membership had been looked at by the Sub-Committee and whether or not the International Society should not receive some income from this source. If we received even $50 from some 300 institution members this would give us an additional income of $15,000.

The Secretary General gave a rough estimate for the future annual expenditure as follows:

Secretariat	$14,000
Travel etc	7,000
List of members (net)	4,000
Contingencies	1,000
	$26,000 (U.S.)

He pointed out that the costs of running the Society had hitherto been carried to a large extent by the Institution of Civil Engineers and it was now going to be necessary for the costs to be realistically borne by ISSMFE. On the proposal of Dr. D'Appolonia, seconded by Mr. Meigh the estimate for $14,000 for the Secretariat was accepted (15-9) as a rough guide as to what was going to be required in the next two years.

On the proposal of Dr. D'Appolonia, seconded by Prof. Tsytovich it was agreed (13-10) that $7000 was an acceptable estimate for the annual expenditure on travel for the next two years.

On the proposal of Dr. D'Appolonia, seconded by Dr. Simpser it was agreed that $4000 should be laid aside for production of the List of Members and

me déterminé par le produit national par habitant, tel que fixé par la Banque Mondiale.

4. Les pourcentages p_1, p_2 et p_3 du budget total sont fixés par le Comité Exécutif.

Les expressions possibles de cette suggestion sont données dans trois tableaux.

Le Prof. Prakash a indiqué que l'augmentation de 25 cents à 75 cents par capita depuis 1965 provoque une certaine diminution du nombre de membres de l'Association Nationale Indienne et qu'une telle augmentation ultérieure pourrait réduire encore ce nombre.

Le Dr. Nelson demande si la question des membres collectifs a été discutée par le Sous-Comité et si la Société Internationale ne pourrait pas récevoir un certain apport de cette source. Si nous recevions même 50 dollars de chacun de quelques 300 membres collectifs, l'apport supplémentaire montérait à 15.000 dollars.

Le Secrétaire Général a donné à titre approximatif le calcul des dépenses annuelles à venir:

Secrétariat	- 14.000 doll.
Voyages, etc.	- 7.000
Liste de membres (nette)	4.000
Contingences	- 1.000
	26.000 dollars (USA)

Il a indiqué que la Société est soutenue financièrement par l'Institution of Civil Engineers et que à présent il devient nécessaire de transférer cette charge à la SIMSTF. Sur la proposition du Dr. D'Appolonia soutenue par M.Meigh, on a adopté la somme de 14.000 dollars pour le Secrétariat. On croit qu'elle convient aux exigences des deux ans à venir.

Sur initiative de Dr. D'Appolonia soutenue par Prof. Tsytovitch, on est tombé d'accord sur la somme de 7.000 dollars pour les voyages pendant des deux années prochaines.

Sur la proposition du Dr. D'Appolonia soutenue par le Dr. Simpser on a décidé que 4.000 dollars doivent être réserves pour l'édition de la liste des membres et 1.000 dollars pour les contingences.

La somme totale de 26.000 dollars a été considérée alors comme une somme raisonnable bien que beaucoup de membres éstiment qu'une telle grande augmentation du budget puisse provoquer des difficultés relatives à l'admission de nouveaux membres aux Sociétés Nationales.

Le Comité s'est alors ajourné et a chargé le Sous-Comité y compris M.Meigh de rédiger les remarques et les corrections approprées.

$1000 for contingencies. The total of $26,000 was therefore considered by a majority to be a reasonable figure though many members considered that such a large increase in the budget could lead them into difficulties with their home memberships, especially as adequate notice of this increase had not been given.

The Committee adjourned at this point and the Sub-Committee, with Mr. Meigh added, was asked to bring in revised proposals.

16. Mr. Meigh introduced the notes which are attached to the Minutes as Appendix III. Mr. Meigh pointed out that two possible budgets were being allowed for

(a) $26,000 as agreed in Minute 15
and
(b) $20,000 if pruning were felt necessary.

The suggestion is that the total dues for a country should be fixed and it should be left to the country the precise method of raising the amount, either by dividing the sum equally between members or by having industrial members or by other means.

Mr. Meigh wished to add to the report, as tabled a requirement that a notional minimum number of members should be decided for each National Society, either in proportion to the number of civil engineers in that country, or on some other reasonable basis. The purpose of this would be to prevent National Societies from reducing their membership in order to reduce their total subscription.

Prof.de Beer agreed in principle that measures should be taken to prevent this. He pointed out however that this should not be included in the motion, as it would then not be in accordance with article 19 of the By-Laws, since this article refers to "The number of members in the National Society being that at the time the payment is due". He suggested that this point should be treated as laid down in Articles 35 and 36 of the Constitution. That is to say, that any proposal concerning the fixing of a notional minimum number of members should be submitted in writing to the Secretary General early enough to have the proposal submitted to all National Societies at least three months prior to the next Executive Committee Meeting. In this way this important point could be considered at the next Executive Committee Meeting.

In the light of Prof.de Beer's comment, Mr. Meigh agreed to omit from the motion the point concerning a notional minimum

16. **M.Meigh présente le nouveau rapport (voir l'annexe IV au procès-verbal) et soulligne que deux budgets possibles peuvent être acceptés:**
(a) 26.000 dollars US, comme il est indiqué dans le point 15
(b) 20.000 dollars US, il est nécessaire de diminuer le budget.
La proposition consiste à ce que seule la somme totale de la côtisation d'un pays soit fixée et que chaque pays puisse employer sa propre méthode pour la récouvrer, soit par la division de la somme en parties égales entre les membres, soit par le recrutement de membres industriels, soit par d'autres moyens.

Le Prlf. de Beer se demande si le Comité Exécutif a le droit de modifier le système de fixation des cotisations, établi par le By-Law 19. Le Président a fait lecture de ce By-Law et pense que ces propositions sont complétement acceptables. Le Prof. de Beer a exprimé son accord.
La proposition de M.Meigh d'accepter la rapport a été soutenue par Dr. Simpser.
Prof. Prakash a fait une objection contre la somme de 26.000 dollars du budget comme indiqué dans l'Annexe B(a) et a proposé 20.000 B (b). Le Prof. Kezdi et beaucoup d'autres se sont prononcés pour cette proposition.
M.Meigh a indiqué que la somme de 20.000 dollars peut être accepté sous la condition que le prix de la publication de la liste des membres soit payé par le pays-organisateur du prochain Congrès.
Le vote des amendements a été unanime.
Le Dr. Nelson a remarqué que l'Asie Sud-Est n'était pas introduite dans l'Annexe A. Il croit qu'elle devrait appartenir au Groupe 3, et il a proposé d'omettre la référence à l'O.N.U. Cette idée a été soutenue par Dr. D'Appolonia qui a proposé de remplacer cette référence à l'O.N.U. par SIMSTF/ONU. On a accepté cette proposition.
Puis on a voté le rapport avec le point (b) dans l'annexe B au lieu du point (a). Le rapport est adopté à l'unanimité. Ainsi en est tombé d'accord que la somme du budget soit fixé à 20.000 dollars US, ce qui est unanimement adopté.(1) Conformément à cette décision, le By-Law 19 sera corrigé.

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(1) - sans décomposition imposée.

number of members. The President confirmed that the motion would not then be contrary to the By-Laws.

Mr. Meigh proposed and Dr. Simpser seconded the adoption of the following motion:

"In accordance with By-Law 19, the new basis of subscriptions shall be as follows. The amount of the annual subscription of each member country shall be determined by adding together the two following sums:

Item 1 Fixed fee per member country, $100 US

Item 2 A variable sum depending on the latest scale of assessment adopted by the United Nations. The classification of the member countries into the eight groups under this item at the date of the approval of this revision of the basis of subscription is given in Appendix A. The amount payable in US dollars is given in Appendix B."

Prof. Prakash was unhappy about budgeting for $26,000 as in Appendix B(a) and proposed an amendment to delete this column. This was seconded by Prof. Kézdi and many spoke in support of it.

Mr. Meigh stated that the $20,000 budget was based on the assumption that the cost of printing the List of Members should be carried by the next Conference host country.

On the vote the amendment was carried nem con.

Dr.Nelson pointed out that S.E. Asia had not been specifically included in Appendix A: he thought it should probably be in Group 3 but he proposed that reference to the United Nations should be omitted. This was seconded by Dr. D'Appolonia.

Dr. D'Appolonia then suggested that ISSMFE/UN should be substituted in place of reference to the United Nations and this was agreed.

The adoption of the report using column (b) in Appendix B in place of column (a) was then voted upon and this was accepted unanimously. It was thus agreed that the budget should be amended to $20,000 without specifying the individual items and this was carried unanimously.

By-Law 19 will now be amended accordingly.

17. The Secretary General introduced the report on the French translation of the Statutes which had been prepared by Monsieur Florentin and Monsieur Mayer and which had been circulated with the Agenda. As these involve no change in meaning and on the proposal of Prof. Kerisel, seconded by Prof.de Beer, it was agreed that the new translation should be adopted for the next printing of the Statutes.

18. Dr. Broms mentioned that Sweden was still unhappy about the name of the Society and a brief discussion took place on this subject. The President recalled that it had been discussed at great length at Sydney when International Geotechnical Society had been considered as an alternative, but this was rejected as being too wide as it includes rock mechanics and engineering geology. Prof. Tsytovich preferred our present title as this includes 'foundation engineering'. It was agreed that no change should be made at present.

19. The proposal from Australia (Appendix IV) that an Institute for the publicity and exchange of geomechanics computer programmes should be set up was introduced by the Australasian Vice-President. He repeated the offer from CSIRO to run such an institute and this was warmly accepted on the understanding that it would not involve ISSMFE in any financial cost. He proposed that the President should be asked to set up a Sub-Committee to advise with respect to the scheme. This was seconded by Prof.de Beer and was carried unanimously.

20. Professor Prakash on behalf of the Indian National Society spoke of the feeling amongst his members that they receive very little for the dues they pay to ISSMFE and he wondered if they might not be sent something more tangible such as summaries of papers presented to our international conferences. He also wanted more information to be given to National Societies about the decisions of the Executive Committee. The President pointed out that membership of ISSMFE opened the door to wider participation in international soil mechanics and that he knew of no other international society which distributed such summaries. The Secretary General stated that full minutes of our meetings were always given to each person present, who was expected to report back to his appointing committee, and in addition a full set was posted independently to the National Society secretaries.

17. Le Secrétaire Général a présenté le rapport sur la version française des Statuts préparée par M.M.Florentin et Mayer et distrubuée parmi les membres avec l'ordre du jour. Sur la proposition de Prof. Kérisel soutenue par Prof. de Beer, on est tombé d'accord sur la nouvelle version qui est acceptée pour la publication prochaine des Statuts.

18. Le Dr.Broms a noté qu'en Suède, on n'est pas satisfait de la dénomination de la Société. A la suite d'un bref échange de vues, le Président a rappelé que l'on avait discuté cette question à Sydney où, la dénomination "Société Internationale Géotechnique" avait été proposée.
Cette proposition avait ete repoussee comme ayant un sens beaucoup plus large au regard de la mecanique des roches et de la geologie appliquee. Le Prof. Tsytovitch estime que la denomination actuelle est la plus acceptable car elle contient "les travaux de fondations". Il a ete dedice de ne faire aucun changement.

19. Le Vice-President de l'Australasie a exprime le souhait que l'Australie (voir l'Annexe 5) mette sur l'organisation d'un institut qui elaborerait et distribuerait les programmes pour les ordinateurs dans le domaine de la geomecanique. Il a expose la proposition CSIRO de se charger de l'organisation de tel institut. Cette proposition est acceptee sous reserve qu'elle n'apporte pas a la SIMSTF de depenses financieres. Il a propose de demander au President de nommer un sous-commission pour regler cette question. Le Prof. de Beer l'a soutenu. Le vote a ete unanime.

20. Au nom de la Societe Nationale Indienne le Prof. Prakash a expose le desir d'augmenter la quantite des materiaux d'information donnees a l'Inde en contrepartie de la somme de cotisations qu'elle paye a la SIMSTF et, en particulier, que chaque membre recoive les resumes des rapports des Congres Internationaux aussi que les comptes rendus concernant l'activite et les resolutions du Comite Executif. Le President a repondu que les membres de la SIMSTF ont une large possibilite de mecanique des sols et que les prestations fournies par notre Societe se comparent favorablement a d'autres. Le Secretaire General a note que les proces-vorbaux complets sont toujours distribues aux personnes presentes au Comite Executif afin qu'ils aient la possibilite de les presenter a leurs Comites Nationaux. En outre, le texte complet de documents est envoye separmenent aux Secretariats des Societes Nationales.

21. On behalf of the French National Society Prof. Kerisel proposed the co-ordination of activities of our Society with those of ISRM and IAEG and spoke of the meetings which have already taken place in Brussels between the three Secretaries General following the initiative of Professor de Beer.

Professor de Beer spoke of the close connection between these three Societies (which deal in fundamentals rather than in particular structures) and of the 40% overlap in membership. Following discussions with the President he had approached the Belgian Government who had generously made available the funds for preliminary meetings of the three Secretaries General to take place in Brussels and these were held in December 1972 and May 1973.

Dr. Wolters spoke on behalf of IAEG and indicated that the proposed statutes would be discussed at the next meeting of his Society's Executive Committee when he hoped they would be approved.

Prof. Kerisel moved the adoption of the draft Statutes which had been circulated with the Agenda (Appendix V) and this was seconded by Prof. Stefanoff. Dr. Koenig considered that this new move was greatly to be welcomed and that Prof.de Beer was to be greatly thanked for the hard work he had done in this connection. It was specially welcomed that this new Secretariat would be no expense on our Society. The proposal was adopted unanimously.

22. Dr. MacDonald reported that in 1970 UNESCO had invited our Society, along with seven other Societies, to create a working group on Seismic Phenomena associated with Large Reservoirs and that the President had invited him to be our representative on the group. The group has so far met three times and a future meeting is planned in Canada in 1975. All expenses are being met by UNESCO.

Dr. MacDonald was thanked for the work he has done on our behalf and he agreed to represent us at the Canadian meeting.

23. Dr. MacDonald reported that UNESCO had set up a consultative committee of experts on Strong Ground Motion due to Earthquakes and had invited us to appoint a member to it. The President had asked Professor Morgenstern to undertake this task and in his absence Dr.MacDonald summarised Professor Morgenstern's report on the meeting which had taken place in 1971.
Professor Morgenstern was thanked for his service (which again had involved

21. Au nom de la Societe Nationale Francaise, le Prof. Kerisel a propose d'etablir une certaine coordination de l'activite de notre Societe avec la SIMR et la ISEG et a parle de la rencontre des trois Secretaires Generaux organisee a Bruxelles a l'initiative du Prof. de Beer. Le Prof. de Beer a parle de contacts entre les trois Societes mentionnees /qui realisent une coordination plutot sur les problemes principaux que sur les questions particulieres;40% des personnes concernees appartiennent a plusieurs des trois societes.

Apres quelques entretiens avec le President il s'est adresse au gouvernement Belge qui a immediatement assure les moyens materiels pour les rencontres preliminaires des trois Secretaires Generaus a Bruxelles qui ont eu lieu en

decembre 1972 et en mai 1973.

Le Dr. Wolters a pris la parole au nom de l'ISEG et a indique que les Statuts proposes pour le Secretariat permanent seront discutes a la seance prochaine du Comite Executif de cette Societe et, comme il l'espere, ils seront adoptes.

Le Prof. Kerisel a propose d'accepter le projet des Statuts qui ont ete distribues aux participants avec l'ordre du jour (voir l'Annexe YI).Cette proposition a ete soutenue par Prof. Stefanoff. Dr.Konig estime qu'elle doit etre accueillie avec entrhousiasme et aussi qu'il avait accompli a ce sujet. On a particulierement approuve le fait que la Societe ne aurait pas depenses pour ce nouveau Secretariat. La proposition a ete adoptee a l'unanimite.

22. Dr.MacDonald a annonce qu'en 1970 l'UNESCO avait invite notre Societe avec sept autres associations a organiser un groupe de travail sur les phenomenes sismiques induits par les grandes retenues d'eau.

Le President lui a propose d'etre notre representant a ce groupe qui a deja tenu deux seances. Sa reunion prochaine est prevue en 1975 a Banff - L'UNESCO s'est chargee de toutes les depenses.

Dr.MacDonald a ete remercie pour son travail et il a accepte la proposition representer la SIMSTF a la reunion a Banff.

23. Dr.MacDonald a indique que l'UNESCO avait cree le Comite Consultatif d'experts sur les grands mouvements des sols due aux seismes et nous avait prie de designer un membre.Le President a prie le Prof. Morgenstern de se charger de cette responsabilite. En raison de son absence. Dr.MacDonald a lu son rapport pour la seance tenue en 1971.On a remer-

the Society in no financial expenses) and it was hoped that he would be willing to continue to represent us on the Committee.

24. The Secretary General reminded the Committee that discussions had taken place in Mexico about our continued membership of UATI and since the Sydney meeting he had been advised by Monsieur Mayer and Dr. Chamecki that we were unlikely to receive further funds from them and that we should resign. He had consulted with the President and since the end of 1972 we no longer belonged to UATI.

25. The Vice-President for North America (Dr. MacDonald) reported on the activities of the member societies in the region in the last four years. His written report is attached to the Minutes as Appendix VI.

26. The Vice-President for Australasia (Prof. Davis) reported on the activities of the Australian and New Zealand Societies in the last four years. His written report is attached to the Minutes as Appendix VII.

27. The Vice-President for Europe (Prof.de Beer)reported on the activities of the many European member countries. His written report is attached to the Minutes as Appendix VIII.

28. The President commented that the three reports which we had heard indicated the Society in their regions was continuing to go from strength to strength and in the absence of the other three Vice-Presidents he was certain that members would be happy to read of similar progress in the remainder of the world when the other reports were published with the Minutes.
(Africa - Appendix IX;
South America - Appendix X;
Asia - Appendix XI).

29. The President spoke of the unanimous nomination of Professor Jean Kerisel as next President of ISSMFE (1973-77) and this was confirmed by unanimous vote. Professor Kerisel warmly thanked members for their support and expressed his earnest desire to serve our Society to the best of his endeavour.

30. The President reported on the postal elections for Vice-Presidents for the period 1973-77 which had taken place and the new appointments were approved unanimously as follows:

cie Prof. Morgenstern Pour son travail (qui n'entrainait aucunes depenses de la part de la Societe) et on a exprime l'espoir qu'il continue de representer notre Societe dans ce Comite.

24. Le Secretaire General annonce que depuis 1972 suivant en cela les avis donnes par Mr.Mayer et par M.Chernecki, nous avons donne notre demission de l'UATI.

25. Dr.MacDonald, Vice-President d'Amerique du Nord a fait l'etat de l'activite des societes-membres de cette region pour les quatre ans ecoules. Son rapport figure a l'Annexe VII du proces-verbal.

26. Prof. Davis, Vice-President d'Australasie a presente le rapport de l'activite des Societes, d'Australie et de Nouvelle Zelande pour la meme periode figure a l'Annexe VIII.

27. Prof. de Beer, Vice-President d'Europe a presente le rapport de l'activite de plusieurs Societes europeennes. Son rapport figure a l'Annexe IX.

28. Le President a remarque que les trois rapports presentes par les trois Vice-Presidents indiquent que la Societe continue de se renforcer dans ces regions et que, malgre l'absence des trois autres Vice-Presidents, il est sur que les membres seront heureux de lire tous les rapports qui seront publies au proces-vierbal (Annexe X-Amerique du Sud, Annexe XI-Asie).

29. Le President confirme la proposition postale unanime du Prof. Jean Kerisel comme prochain President (1973-77).Cette proposition a ete confirmee par un vote unanime.

Le Prof. Kerisel a chaleureusement remercie les membres du Comite Executif pour leur confiance et a exprime son tres grand desir sincere de servir la Societe du mieux qu'il le pourra.

30. Le President a annonce l'election postale des Vice-Presidents pour 1973-77 et ces designations ont ete approuvees unanimement:

Afrique Dr.J.W. de Graft Johnson (Ghana)
Asie Prof.Z.-C.Moh (Asie S.-E.)
Australasie Prof. P.W.Tayler (N.Zelande)
Europe Prof. A.Kezdi (Hongrie)
Amerique N. M.Prof. R.J.Marsal(Mexique)
Amerique S. Prof.V.F.B.de Mello (Bresil)

Africa	Dr.J.W.de Graft Johnson	(Ghana)
Asia	Prof. Z-C Moh	(S.E.Asia)
Australasia	Prof. P.W. Taylor	(New Zealand)
Europe	Prof. A. Kézdi	(Hungary)
N.America	Prof. R.J. Marsal	(Mexico)
S.America	Prof. V.F.B.de Mello	(Brazil)

31. The President spoke of the invitations which had been received from India, Japan and the Federal Republic of Germany for the 1977 Conference and asked the representatives of these countries to extend the invitations so that they could answer any questions which members might wish to raise. Dr.MacDonald asked for assurances about By-Law 15 which states that all our members should be able to attend the Conference without discrimination and this was given by Professor Prakash, Professor Fukuoka and Dr. Koenig.

The voting was as follows:

Federal Republic of Germany	9
India	3
Japan	17
Blank	1
	30

The decision for the Conference to be held in Japan was met with acclamation.

32. The Secretary General spoke of the two invitations which had been received for the next Executive Committee meeting in 1975, from Israel and South Africa and of a third from Turkey which had since been received.

The voting was as follows:

Israel	1
South Africa	3
Turkey	23
Blank	3
	30

and the Turkish invitation for the Executive Committee meeting to be held in Istanbul either in July or September 1975 was accepted with acclamation.

33. Dr. D'Appolonia spoke of the necessity for long-term planning in connection with our International Conferences and of the desire of the United States National Committee to act as hosts in 1985 - the Golden Jubilee of our Society which held its first Conference in 1936. He pointed out that to act as host to such a conference nowadays involves raising a very large sum of money - $\$^1/_4$M now

31. Le President a parle des invitations recues de l'Inde, du Japon et de la Republique Federale Allemande pour le Congres de 1977 et a prie les representants de ces pays de commenter leurs invitations et de repondre a toutes les questions des membres de la Societe. Le Dr. MacDonald leur a demande de confirmer le By-Law 15 etablissant que tous les membres de notre Societe peuvent prendre part au Congres sans discrimination. Le Prof. Prakash, le Prof. Fukuoka et le Dr. Konig l'ont confirme. Les resultats du vote sur cette question sont:

R.F.A.	9
Inde	3
Japon	17
Bulletin nul	1
Total:	30

La decision de tenir le Congres prochain au Japon a ete accueillie par acclamation.

32. Le Secretaire General a annonce deux invitations reques pour la seance prochaine du Comite Executif (1975), de l'Israel, de l'Afrique du Sud, et aussi celle de la Turquie qui vient d'etre recue.
Le Dr. Togrol a commente cette invitation de la Turquie et confirme que chaque pays-membre pourrait prendre part a la seance sans discrimination. Le Secretaire General a annonce que confirmation semblable a ete egalement recue de l' Afrique du Sud. Les resultats du vote sur cette question:

Israel	1
Afrique du Sud	3
Turquie	23
Bulletins nuls	3
Total :	30

L'invitation de la Turquie de tenir le Comite Executif a Stamboul en juillet ou en septembre 1975 a ete accueillie par acclamation.

33. Le Dr.D'Appolonia a parle de la necessite de planification a long terme de nos Congres Internationaux et a exprime le desir que le Comite National des Etats-Unis soit organizateur du Congres en 1985 a l'occasion du cinquantenaire

and perhaps $\$^1/_2$M in 1985. This is normally raised as follows:

Conference dues	1/3
Members of host country	1/3
Government of host country	1/3

but in the United States Government financial support is lacking and two-thirds of the funding would therefore have to come from the members of the U.S. National Committee. To raise such a sum needs a long period of time and he therefore proposed the following motion

> "that this Executive Committee shall show in its Minutes that the USA will receive No.1 priority as hosts for the 1985 Conference".

This was seconded by Professor Stefanoff. Professor Mohan was against making such a firm commitment at this stage and Professor Davis suggested as an amendment

> "that the Executive Committee views with favour at this juncture that the Conference in 1985 should be held in the U.S.A."

This was seconded by Prof.de Beer and the amended motion was carried with only one country dissenting.

34. The President referred to the report of the Conference Advisory Committee which had been presented to the Sydney Executive Committee and stated that it is now our policy to carry out its recommendations in planning the 1977 Conference. Professor Kerisel concurred with this and added that topics and speakers for the conference should be arrived at by a concensus of the opinions of the National Societies working through the Executive Committee, meeting in Istanbul in 1975. Dr.MacDonald, who had been Chairman of the Committee agreed with this procedure.

35. A written report on the work of the Committee on Symbols and Units was received from Dr. Golder, its Chairman. The report followed largely the one previously presented to the Sydney Committee and is attached as Appendix XII. Dr. Broms spoke of the desirability of using kN/m^2 as the unit of pressure and this view was generally endorsed by the meeting.

36. A written report on the work of the Sub-Committee on Soil sampling was submitted by Dr. Aitchison, and Dr.Broms spoke to it briefly. The report is attached as Appendix XIII. The Sub-Committee is proposing to have a final meeting in Hawaii in 1975.

de notre Societe qui avait tenue son premier Congres en 1936. Il a souligne que l'organisation d'un Congres pareil, de nos jours, exige tres grandes depenses montant a 250.000 dollars aujourd'hui et peut etre 500.000 dollars en 1985.La somme totale comprend les depenses suivantes:

Cotisations d'inscription	I/3
Participants officiels du pays-organisateur	I/3
Allocations gouvernementales du pays-organisateur	I/3

mais, comme on ne peut pas compter sur le support financier du gouvernement americain, il faut que 2/3 de finances necessaires soient recues des membres du Comite Ntional Americain. Afin d'accumuler une somme pareille, un grand delai de temps est necessaire, et c'est pourquoi Dr. D'Appolonia a fait la proposition suivante:

"Le Comite Executif notera dans son proces-verbal que les Etats-Unis ont priorite pour organiser le Congres en 1985". Cette proposition a ete soutenue par le Prof. Stefanoff. Le Prof. Mohan a eleve une objection contre une formulation aussi ferme. Le Prof. Davis a propose l'amendement suivant:

"Le Comite Executif considere avec faveur que le Congres de 1985 puisse etre organise aux Etats-Unis". Cette formulation a ete soutenue par Prof. de Beer, et la resolution corrigee a ete accepte presque unanimement (une voix contre).

34. Le President a evoque le rapport du Comite Consultatif de l'organisation des Congres qui avait ete presente au Comite Executif a Sydney, et il a indique qu'il est necessaire de preparer les recommendations relatives au Congres de 1977.Prof. Kerisel l'a soutenu et ajoute que les themes et les rapporteurs devraient etre choisis en accord avec les positions des Societes Nationales a la reunion a Stamboul en 1975.Dr.MacDonald, President du Comite, a accepte cette procedure.

35. Le rapport ecrit sur l'activite du Comite de Symboles et d'Unites a ete recu du Dr. Colder, son President. De rapport est tout a fait conforme au rapport soumis au Comite a Sydney et est place a l'Annexe XII. Le Dr.Broms a indique au'il est desirable d'utiliser le kN/m^2 comme unite de pression, et ce point de vue a ete approuve par la majorite des membres.

36. Le rapport ecrit de l'activite du Sous-Comite de la prise d'echantillons de sols, prepare par Dr. Aitchison et Dr. Broms, a ete presente brievement et est place a l'Annexe XIII Le Sous-Comite prevoit tenir une reunion finale aux Hawaii en 1975.

37. A report on the work of the Information Advisory Committee was received from its Chairman, Mr. J. de Salvo and this was presented by Mr. Flodin, a member of the Committee. He spoke of the continuing success of Geotechnical Abstracts (G.A.) produced by the German Federal Republic National Society and of the Geodex Retrieval System (G.R.S.) both of which are officially sponsored by ISSMFE. Regretfully the number of subscribers has not risen as had been hoped and it has therefore been necessary to increase the subscription price for both G.A.and G.R.S. The report is attached as Appendix XIV and member countries are urged to assist the promotion of these valuable ventures in the manner suggested in the Report.

The President said that the policy of the Society was to support fully the activities and the products of this Information Advisory Committee and this was fully accepted by the Executive Committee.

Prof.Moh spoke of the new storage and retrieval system being produced by the Asian Information Centre for Geotechnical Engineering and stated that there was no intention to provide any alternative to G.A. or G.R.S. but to complement it and Dr. Nelson endorsed this by pointing out that the S.E. Asian Society had offered free advertising space to these bodies in its Journal. The service was for engineers in the region and would include reports and information particularly relevant to their needs and the President observed that he and many others of the members present had cognisance of the scheme as it developed. The organisers of Asian Information Centre for Geotechnical Engineering and the members of the Information Advisory Committee were encouraged to meet during the Moscow Conference.

The report with amendments to the text was adopted.

37.Le rapport de l'activite du Comite Consultatif d'information a ete recu de M.I. de Salvo, son President, et a ete lu par M.Flodin, membre du Comite. Il a marque le succes des Abstracts Geotechniques (G.A.) publies par la Societe Ntionale de la R.F.A. et du Retrieval System "Geodex", tous les deux sous le patronage de la SIMSTF.Malheureusement, le nombre de souscripteurs n'est pas suffisant, et il est necessaire d'augmenter la prix des editions. Le rapport est place a l'Annexe XIY, et les pays-membres devient contribuer a la diffusion de ces publications comme il est indique dans le rapport. Le President a dit que la Societe soutenait l'activite du Comite Consultatif d'information dont le rapport a recu l'approbation du Comite Exectif. Le Prof. Moh a parle du nouveau "storage and retrieval system" etabli par le "Systeme Asiatique d'Information" et il a indique qu'il n'y avait pas d'intentions de concurrence avec le G.A. ou le G.R.S.,mais bien de les completer. Le Dr. Nelson l'a confirme en indiquant que la Societe d'Asie Sud-Est avait reserve une publicite gratuite pour ces organismes dans sa revue.

Les informations au systeme sont utiles pour les ingenieurs et comprennent toutes les donnees necessaires pour eux. Le President a indique que lui-meme et beaucoup d'autres parmi les presents sont au courant du systeme et de son developpement. On a propose aux auteurs du Systeme Asiatique d'Information et aux membres du Comite Consultatif d'Information d'organiser une seance conjointe pendant le Congres de Moscou.

Le rapport a ete adopte avec des correction de texte.

38. The President, in consultation with Professor Kerisel agreed that the following new Committees should be appointed:

(i) A Sub-Committee to deal with advertisements in the List of Members (including Professional cards)

(ii) A new Conference Advisory Sub-Committee to act for the next four years.

(iii) A Budget and Finance Sub-Committee to make recommendations on the subject of dues

38.Le President, apres consultation avec Prof. Kerisel, a pris decision d'organiser les nouveaux sous-Comites suivants:

1.Sous-Comite de publicite dans la liste des membres de la Societe (cartes professionnelles).

2.Sous-Comite Consultatif pour la preparation du Congres prochain.

3.Sous-Comite budgetaire et financier pour l'elaboration des recommendations relatives aux souscriptions.

4.Sous-Comite relatif au CSIRO (Banque des Programmes d'ordinateurs).

(iv) A Sub-Committee to advise CSIRO on the Institute for the publicity and exchange of geomechanics computer programmes.

It was agreed that the members of these committees need not be named at this juncture and delegates were invited to make suggestions as to names of suitable persons to serve either to the President or to Professor Kerisel.

39. The President proposed that Prof.Nash should be appointed as Secretary General for the period 1973-1977 and this was unanimously approved. He pointed out that it would be very difficult for a new President to take over at the same time as a new Secretary General. In his reply of thanks Professor Nash spoke of the pleasure he had obtained from working for the President and the Society and he gave notice that at the interim Executive Committee after the next Conference he would be planning to retire.

Dr. D'Appolonia asked that attention be given to the question of continuity at our next meeting in Turkey.

40. Professor Peck spoke of the great unhappiness which had been caused by the absence of the delegates from certain countries, in particular South Africa, Israel and Rhodesia, despite the strenuous efforts which had been made to secure their attendance.

41. The meeting closed at 18.15.

Signed in and on behalf
of the Executive Committee

Ralph B. Peck,
President

Les membres de ces comites ne seront pas nommes pour le Moment, et les delegues sont pries de faire leurs propositions de personnes a designer soit au President, soit au Prof. Kerisel.

39. Le President a propose que le Prof.Nash soit nomme Secretaire General pour les annees I973-I977. Cette proposition a ete approuvee a l'unanimite. Il a souligne particulierement, que le remplacement simultane du President et du Secretaire Gneneral provoquerait des difficultes serieuses. En reponse, Prof. Nash a dit qu(il est tres satisfait de son travail conjoint avec le President et dans la Societe en general mais il a indique qu(il a L'intention de se demissionner apres le Congres suivant.

Le Dr.D'Appolonia a demande qu'au cours de la reunion prochaine en Turquie on prete une attention particuliere a la question de continuite des cadres dirigeants.

40.Le Prof. Peck a exprime son regret de l'absence des delegues de certains pays, en particulier, de l'Afrique du Sud, de l'Israel et du Portugal, malgre tous les efforts en vue de garantir leur presence.

4I.La seance a ete close a I8 h. I5min. le 3 aout I973.

Au nom du Comite Executif

Ralph B.Peck,
President

APPENDIX

MEMBERSHIP AT 1st January 1974

	Europe	Asia	Africa	North America	South America	Australasia	Total
Argentina	-	-	-	-	97	-	97
Australia	-	-	-	-	-	494	494
Austria	47	-	-	-	-	-	47
Belgium	83	-	-	-	-	-	83
Brazil	-	-	-	-	132	-	132
Bulgaria	92	-	-	-	-	-	92
Canada	-	-	-	542	-	-	542
Chile	-	-	-	-	23	-	23
China	-	100	-	-	-	-	100
Colombia	-	-	-	-	17	-	17
Czechoslovakia	35	-	-	-	-	-	35
Denmark	72	-	-	-	-	-	72
Ecuador	-	-	-	-	39	-	39
Finland	103	-	-	-	-	-	103
France	260	-	-	-	-	-	260
F.R.G.	900	-	-	-	-	-	900
G.D.R.	23	-	-	-	-	-	23
Ghana	-	-	25	-	-	-	25
Greece	48	-	-	-	-	-	48
Hungary	25	-	-	-	-	-	25
India	-	446	-	-	-	-	446
Iran	-	30	-	-	-	-	30
Ireland	6	-	-	-	-	-	6
Israel	-	114	-	-	-	-	114
Italy	456	-	-	-	-	-	456
Japan	-	221	-	-	-	-	221
Mexico	-	-	-	277	-	-	277
Morocco	-	-	140	-	-	-	140
Netherlands	82	-	-	-	-	-	82
New Zealand	-	-	-	-	-	168	168
Norway	188	-	-	-	-	-	188
Pakistan	-	27	-	-	-	-	27
Peru	-	-	-	-	38	-	38
Poland	30	-	-	-	-	-	30
Portugal	167	-	-	-	-	-	167
Rhodesia	-	-	224	-	-	-	224
South Africa	-	-	418	-	-	-	418
S.E.Asia	-	188	-	-	-	-	188
Spain	170	-	-	-	-	-	170
Sweden	259	-	-	-	-	-	259
Switzerland	624	-	-	-	-	-	624
Tunisia	-	-	15		-	-	15
Turkey	42	-	-	-	-	-	42
United Kingdom	819	-	-	-	-	-	819
U.S.A.	-	-	-	734	-	-	734
U.S.S.R.	214	-	-	-	-	-	214
Venezuela	-	-	-	-	177	-	177
Yugoslavia	78	-	-	-	-	-	78
Countries	24	7	4	4	7	2	48
Members	4823	1126	807	1568	523	662	9509

APPENDIX I

Publication of ISSMFE List of Members, 1972

At the Executive Committee Meeting of August 1971 the Southeast Asian Society of Soil Engineering offered to supervise publication of the List of Members, on behalf of ISSMFE. A quotation for printing from Libra Press, Hong Kong, was accepted in September 1971 by the Secretary General, ISSMFE.

Editing was carried out by Mr P. Lumb in Hong Kong. Due to his absence from Hong Kong during April to August 1972 about one-third of the first proof and all the final proof was checked by Dr J.D. Nelson and Dr Z-C Moh of A.I.T. in Bangkok.

Editorial Work

Lists of members of the National Societies were called for in August 1971 with the intention that printing would commence in January 1972. Half of these lists were received in Hong Kong during January but the complete text was not received until mid-March 1972.

The majority of the lists had been well prepared and needed little editing. The total editing time was approximately 12 working days.

Printing

Printing commenced in February 1972. Some delay occurred due to lack of diacritical marks for German, Slavic, Scandinavian, Turkish, etc., alphabets, which had to be ordered by the printer.

Two-thirds of the first proof had been checked in Hong Kong by March, and the remaining one-third and the entire final proof checked in Bangkok by July 1972.

A total edition of 9,500 copies was printed by September 1972.

Despatching

Packing and despatching was carried out by the printer. Lists to societies with small membership were sent by surface mail while lists to societies with large memberships were sent by sea freight.

Considerable difficulties arose in shipping freight to certain countries from Hong Kong and this caused unavoidable delays. Shipping was not completed until January 1973.

Although the printer had been instructed to insert the Geotechnical Abstracts brochure into each copy of the List of Members, this was unfortunately not done; the brochures merely being included with the lists.

APPENDIX II

ISSMFE INCOME AND EXPENDITURE 1971 - 1973

	Year ended 28th February 1972/73
	$
RECEIPTS:	
Carried forward	13,370.25
Subscriptions (including Arrears)	19,301.32
	32,671.57
EXPENDITURE:	
List of Members	11,944.12
U.A.T.I. 1970-1971	344.06
Audit fee 1970-1971	120.00
Travelling expenses	3,607.32
Central Office	11,103.07
	27,118.57
Balance forward	$5,553.00

APPENDIX III

NOTES

In accordance with bye-law 19, the new basis of subscriptions shall be as follows. The amount of the annual subscription of each member country shall be determined by adding together the two following sums:

Item 1 Fixed fee per member country, $100 US

Item 2 A variable sum depending on the latest scale of assessment adopted by the United Nations. The classification of the member countries into the eight groups under this item at the date of the approval of this revision of the basis of subscription is given in Appendix A.

The amount payable in US dollars is given in Appendix B.

EXPLANATORY NOTES

1. With $26,000 budget
   Item 1 $5,000
   Item 2 $21,000 ... ... column (a)

2. With $20,000 budget
   Item 1 $5,000
   Item 2 $15,000 ... ... column (b)

3. TOTAL SUBSCRIPTION PER NATIONAL SOCIETY

$$= \$\ n \times \left[\frac{100}{n} + \bar{x}\right]$$

where n = number of members in national society and x is given in column (5) of Table III

OR $= \$100 + y$

where y is given in column (4) of Table III.

III.1 Appendix A

SUBSCRIPTION - ITEM 2

Classification of member countries into eight groups depending on the Scale of Assessment Adopted by the United Nations for each country as a member of the United Nations Organisation

Note: The percentage shown against each country thus (1.30) is the Scale of Assessment payable to the United Nations during the years 1968-1970 and is based generally on "Capacity to pay" of each country.

GROUP 1	Percentage 0 to 0.10 per cent		
		Morocco	(0.10)
		Peru	(0.10)
		Tunisia	(0.04)
GROUP 2	Percentage 0.11 to 0.25 per cent		
		Bulgaria	(0.18)
		Chile	(0.20)
		Colombia	(0.23)
		Ireland	(0.17)
		Portugal	(0.16)
		Rhodesia	(----)
GROUP 3	Percentage 0.26 to 0.75 per cent		
		Austria	(0.57)
		Denmark	(0.62)
		Finland	(0.49)
		Greece	(0.29)
		Hungary	(0.52)
		New Zealand	(0.36)
		Norway	(0.43)
		Pakistan	(0.37)
		Romania	(0.36)
		South Africa	(0.52)
		Turkey	(0.35)
		Venezuela	(0.45)
		Yugoslavia	(0.40)

GROUP 4	Percentage 0.76 to 1.25 per cent	Argentina	(0.93)
		Belgium	(1.10)
		Brazil	(0.89)
		Czechoslovakia	(0.92)
		Mexico	(0.87)
		Netherlands	(1.16)
		Spain	(0.92)
		Sweden	(1.25)
		Switzerland	(0.86)
GROUP 5	Percentage 1.26 to 3.00 per cent	Australia	(1.52)
		India	(1.74)
		Poland	(1.47)
GROUP 6	Percentage 3.01 to 8.00 per cent	Canada	(3.02)
		France	(6.00)
		Germany (Fed.Rep)	(7.01)
		Great Britain	(6.62)
		Italy	(3.34)
		Japan	(3.78)
GROUP 7	Percentage 8.01 to 15.00 per cent	Nil	
GROUP 8	Percentage 15.01 to 35 per cent	USA	(32.02)
		USSR	(17.05)

Appendix B

ISSMFE RATING	COST PER MEMBER	
	(a) $26,000 budget	(b) $20,000 budget
1	1.25	1.00
2	1.50	1.15
3	1.75	1.30
4	2.00	1.45
5	2.25	1.60
6	2.50	1.75
7	2.75	1.90
8	3.00	2.05

APPENDIX IV

PROPOSED SCHEME FOR PUBLICITY AND EXCHANGE OF GEOMECHANICS COMPUTER PROGRAMS

(to be organized under the auspices of the ISSMFE)

Submitted by The Australian Geomechanics Society

1. The Secretariat of the ISSMFE would appoint an Institute to act as a central clearinghouse for publicity on programs. (If necessary, CSIRO, Division of Applied Geomechanics, would be prepared to act in this capacity). The modus operandi of the Scheme would be subject to agreement between the Secretariat and the management of the Institute.

2. Scientists and engineers around the world who had developed, tested and fully documented computer programs would be invited to submit them to the Institute together with proforma details regarding the program:

e.g. what it does

input - output arrangements
running costs
forms available (listing, cards, tapes)
charges for making available
name and address of person for further details.

3. The Institute would check that standards of documentation above a defined minimal level were observed by contributors.

4. At least twice a year the Institute would publish booklets containing the accumulated proformas of well-documented programs. The Institute would accept no responsibility for the correctness or accuracy of the programs. Any correspondence stimulated by distribution of the booklets would be addressed to the program originators and not to the Institute. The booklets may also contain discussions on any errors or problems with programs as reported by users or the originators.

5. The booklets would be distributed to the Secretaries of all National Committees and to any individuals or organizations who would subscribe to the ISSMFE amounts calculated to cover the running costs of operating the service. The fact that the service was available could be advertised in the various soil mechanics journals and newsletters around the world.

APPENDIX V

1. Between the International Society for Soil Mechanics and Foundation Engineering, the International Society for Rock Mechanics and the International Association of Engineering Geology, is created a permanent coordinating secretariat.

2. This permanent coordinating secretariat is governed by a Committee, composed of the Secretaries General of the three societies.

3. The seat of the permanent coordinating secretariat is to be at Brussels. By unanimous decision of the members of the Committee the seat can be transferred to another city.

4. The permanent coortinating secretariat is to be run in such a way that the expenses can be covered by grants and subsidies of Governments, or other national or international bodies.

5. The Committee of the secretariat gathers at least once a year at the seat of the secretariat, and at such other time when two members of the Committee propose a meeting.

6. The Committee has all powers for deciding the use of the funds put at the disposal of the secretariat.

7. The Committee appoints a secretary, for running the daily activities of the secretariat; he assists without voting right at the meetings of the Committee.

8. The secretary of the permanent secretariat will be invited to all meetings of the executive committees of the three societies. He has only an advising role in these meetings.

9. The mission of the permanent coordinating secretariat in its broadest sense is to promote the coordination between the affiliated societies, and to defend their mutual interests. The mission is to be specified in detail by the Committee of the secretariat. Each expansion of the mission has to have the unanimous agreement of all members of the Committee.

10. The official languages of the permanent coordinating secretariat are those of the affiliated societies.

APPENDIX VI

VICE PRESIDENT'S REPORT ON NORTH AMERICAN ACTIVITIES

1969 - 1973

D. H. MacDonald - Vice President (North America)

1 - GENERAL

The North American geographical zone of the ISSMFE consists of the three countries of Canada, Mexico and the United States of America. Interest in joining the International Society has been exhibited in past years by several other countries in the Caribbean and Central American regions, and specific enquiries have emanated from Panama and the Dominican Republic during the past 4-year period. However, no

specific applications for membership have been forthcoming. Membership figures for the three countries are as follows:

	January 1, 1968	January 1, 1972	Increase or Decrease
Canada	465	542	+ 77
Mexico	143	277	+ 134
U.S.A.	820	734	- 86
	1,428	1,553	+ 125

Numerically, the membership in the zone has grown by 125 in the 4-year period, and the greatest growth has occurred in Mexico.

The highlight of the 4-year period since the Seventh Conference in Mexico City was the holding of the Fourth Panamerican Conference on Soil Mechanics and Foundation Engineering in San Juan, Puerto Rico, from July 14 - 18, 1971. Sponsors of the Conference were: the Soil Mechanics and Foundations Division of the American Society of Civil Engineers (SMFD), the Institute of Engineers, Architects and Surveyors of Puerto Rico, and the Puerto Rico Section of the ASCE. Registration at this Conference was approximately 350. Seven technical sessions covering the fields of standard penetration tests, slope stability in residual soils, allowable settlements, effects of foundation construction on nearby structures, effectiveness of cutoffs in foundations and dams, accuracy of field deformation measurements, and the business and practice of foundation engineering. Thirty-three papers were presented and, together with the state-of-the-art papers, and the panel and other discussions, they constituted a highly successful technical conference. The meeting also included an enjoyable social program which contributed greatly towards making this conference another in the gradually developing series of successful Panamerican Conferences. Previous conferences had been held as follows:

First Panamerican Conference	- Mexico City	- September 7 - 12, 1959
Second Panamerican Conference	- São Paulo Rio de Janeirs Belo Horizonte	- July 14 - 24, 1963
Third Panamerican Conference	- Caracas	- July 8 - 15, 1967

The Fifth Panamerican Conference will be held in Argentina in 1975.

Other activities in the North American geographical zone are reported below by the three individual countries constituting the zone.

2 - CANADA

Canadian National Society
(Associate Committee on Geotechnical Research)

C. B. Crawford, Chairman

W. J. Eden, Secretary
Division of Building Research
National Research Council of Canada
Ottawa, Ontario, K1A 0R6

Canadian Geotechnical Society

G. G. Meyerhof, President
Department of Civil Engineering
Nova Scotia Technical College
P.O. Box 1000
Halifax, Nova Scotia.

D. L. Townsend, Secretary
c/o H. Q. Golder & Associates Ltd
3151 Wharton Way
Mississauga, Ontario.

On June 1, 1972, the Canadian Geotechnical Society was formed as a constituent society of the Engineering Institute of Canada, with Dr G. G. Meyerhof as its first President. At the time of formation its membership was approximately 400 and it is expected that this will increase to about 500 within a period of one year. Since the formation of the International Society, and at the present time, the role of national society for Canada has been filled by the Associate Committee on Geotechnical Research of the National Research Council of Canada. Negotiations are, however, currently proceeding so that the newly formed Canadian Geotechnical Society will, within a short time, assume the responsibilities of the national society for Canada.

An important accomplishment in Canada in this 4-year period was the undertaking and completion of a study by a committee of the Science Council of Canada entitled "Earth Sciences Serving the Nation". This study dealt with the solid earth sciences, and one of its recommendations has resulted in the formation of the Canadian Geoscience Council, whose function will be to improve communications amongst all societies in Canada interested in the earth sciences.

Activity in the geotechnical field has continued at a high level during the past 4 years with increasing interest in the many aspects of geotechnical engineering. In recent years interest in problems involving permafrost and northern or cold-climate construction has increased greatly. This is particularly reflected in the number of symposia and conferences held in Canada, and a list of the major geotechnical meetings in the country is shown below.

Conference	Location	Date	Theme
1. Conference on Ice Engineering and Avalanche Forecasting and Control	Calgary	Oct. 23-24 1969	Ice Engineering and Avalanche Forecasting and Control
2. Twenty-second Annual Canadian Geotechnical Conference	Kingston	Dec. 8 - 9 1969	Geology and Engineering
3. Research Seminar on Soil Dynamics	Montreal	Mar. 12-13 1970	Soil Dynamics
4. Thirteenth Muskeg Research Conference	Fredericton	May 7 - 8 1970	Muskeg and Environmental Studies
5. Sixth Canadian Symposium on Rock Mechanics	Montreal	May 28-30 1970	Evaluation of In-situ Properties of Rock Masses
6. Twenty-third Annual Canadian Conference	Banff	Nov. 19-20 1970	Geotechnical problems in Transportation
7. Symposium on Stability and Open Pit Mining	Vancouver	Nov. 23-25 1970	
8. Research Seminar on Construction Problems in Permafrost	Saskatoon	Mar. 11-12 1971	Construction Problems in Permafrost
9. Joint Meeting of the Seventh Canadian Symposium on Rock Mechanics and the Fourth Tectonics Symposium	Edmonton	Mar. 25-27 1971	Applications of Structural Geology to Rock Mechanics Problems
10. Seminar on the Permafrost Active Layer	Vancouver	May 4 - 5 1971	Characteristics of the Active Layer
11. Fourteenth Muskeg Research Conference	Kingston	May 10-11 1971	Muskeg and the Critical North
12. First Canadian Conference on Earthquake Engineering Research	Vancouver	May 25-26 1971	
13. Twenty-fourth Annual Canadian Geotechnical Conference	Halifax	Sept. 2-3 1971	Deep Foundations
14. Canadian Northern Pipeline Research Conference	Ottawa	Feb. 2 - 4 1972	
15. Research Seminar on Engineering, Evaluation of the Mechanical Properties of Soils	Quebec City	Sept. 28-29 1972	Evaluation of Mechanical Properties of Soils
16. Symposium on Foundation Problems on Rock	Toronto	Nov. 29 1972	Foundation Problems on Rock
17. Eighth Canadian Symposium on Rock Mechanics	Toronto	Nov. 30 - Dec. 1 1972	Tunnelling in Rock
18. Twenty-fifth Annual Canadian Geotechnical Conference	Ottawa	Dec. 7-8 1972	Foundation Performance
19. National Conference on Urban Engineering Terrain Problems	Montreal	May 7 - 9 1973	
20. Research Seminar on Analytical Methods in Soil Mechanics	Vancouver	May 10-11 1973	Analytical Methods in Soil Mechanics
21. Fifteenth Muskeg Research Conference	Edmonton	May 14-15 1973	Muskeg and the Environment

Note: Further details on these meetings may be obtained from the Secretary of the Canadian National Society.

In addition to these meetings, several international conferences of considerable interest to geotechnical engineers have been held in Canada.

The International Commission on Large Dams held its Tenth International Congress in Montreal from June 1 to 5, 1970, and much of the technical content of the meeting related to earth and rock-fill dam and foundation problems.

Twelfth Congress of the International Society of Photogrammetry was held in Ottawa between July 23 and August 4, 1972.

From August 21-30, 1972, the Twenty-fourth Session of the International Geological Congress was held in Montreal, and included in the extensive program were sessions on engineering geology.

From July 9-18, 1973, the Twenty-third Congress of the Permanent International Association of Navigational Congresses was held in Ottawa. The ISSMFE was represented at this Conference by Mr C.B. Crawford who will be reporting separately to this Executive Committee Meeting.

The series of Trans Canada Lecture Tours initiated many years ago is still continued on an annual basis by the Associate Committee on Geotechnical Research, in co-operation with various universities and local geotechnical groups. By this means, outstanding lectures by eminent workers in the geotechnical field have been sponsored in many cities throughout Canada.

In 1970, the R.F. Legget Award was estblished in honour of Dr R.F. Legget, a former Vice President for North America of our International Society, on his retirement as Director of the Division of Building Research of the National Research Council of Canada. The award is made for achievements of significance to Canada in the field of geotechnical engineering. Recipients of the award have been:

Robert Peterson (posthumously) in 1970
Robert M. Hardy in 1971
Norman W. McLeod in 1972.

The geotechnical community in Canada continues to be served well by the Canadian Geotechnical Journal which is published quarterly by the National Research Council of Canada and is currently in its 10th year.

3 - MEXICO

Mexican National Society
(Sociedad Mexicana de Mecanica
de Suelos A.C.)

Enrique Tamez Gonzalez, President
Facultad de Ingenieria, UNAM
Av. Explanada 1615
Mexico 10, D.F.

Gabriel Garcia Altamirano, Secretary
Sociedad Mexicana de Mecanica de Suelos, A.C.
Apartado Postal 8200
Mexico 1, D.F.

The Mexican Society for Soil Mechanics acts as the National Society for that country. In recent years its membership has grown rapidly and its activities have correspondingly been enlarged. It sponsored the Seventh International Conference of the ISSMFE in Mexico City from August 24-30, 1969. In addition, it sponsors a national meeting at 2-yearly intervals. The Fifth National Conference of Soil Mechanics was held in Mexico City from November 3-4, 1970, and the Sixth such conference was held, also in Mexico City, from November 16-17, 1972.

The highlight of the latter meeting was the first lecture in honour of the memory of Nabor Carillo. These lectures will be at bi-annual intervals and the first one was delivered from November 16-17, 1972, by Dr Arthur Casagrande, a former President of this Society, who chose as his subject "Reflections on Some Unfinished Tasks".

The Mexican Society for Soil Mechanics has been responsible over the years for arranging for the issue of a number of excellent publications on geotechnical work carried out by various agencies in Mexico. In addition, it is now participating in the sponsorship and the publication of "Revista Latinoamericana de Geptecnia" which is published by the Venezuelan National Society of Soil Mechanics and Foundation Engineering and is now in its third year of publication.

4 - UNITED STATES OF AMERICA

U.S. National Society
(Executive Committee of the Soil Mechanics
and Foundation Division of the ASCE)

Joseph M. De Salvo, Chairman
91 Roseland Avenue
Caldwell, N.J. 07006

Delon Hampton, Secretary
Department of Civil Engineering
Howard University
Washington, D.C. 20001

In the United States of America the Executive Committee of the Soil Mechanics and Foundations Division of the American Society of Civil Engineers acts as the U.S. National Society of the International Society. However, other organizations such as the Highway Research Board, and the American Society for Testing and Materials (ASTM) are greatly interested in geotechnical engineering and they contribute much through their publications and through sponsorship of meetings.

The Soil Mechanics and Foundations Division (SMFD) of the ASCE is interested and active in sponsoring technical programs at ASCE meetings and seminars and conferences elsewhere, sometimes jointly with other

technical societies. It publishes its Division Journal at regular intervals, and it is active in promoting the collection and publication of technical data in a number of geotechnical areas through the work of its committees.

The U.S. National Society acted as a co-host for the Fourth Panamerican Conference on Soil Mechanics and Foundation Engineering which was held in San Juan, Puerto Rico from June 14-18, 1971, and reported earlier.

Activity in the related fields of rock mechanics and engineering geology has developed to a high level in the last few years, with particular attention being directed to tunnelling, underground and surface excavation, and associated environmental considerations.

Major soil mechanics conferences and seminars in the U.S.A. since the Seventh Conference in August 1969 have been:

	Conference	Location	Date	Theme
1.	Eighteenth Annual Meeting of the Clay Minerals Society	Fort Worth	Oct. 19-22 1969	
2.	Twelfth Annual Meeting of the Association of Engineering Geologists	San Francisco	Oct. 21-25 1969	
3.	Forty-ninth Annual Meeting of the Highway Research Board	Washington	Jan. 12-16 1970	
4.	Nineteenth Soil Conference of University of Kansas	Lawrence, Kansas	March 13 1970	Laboratory and Field Tests
5.	Symposium on Soil Compaction - Arizona State University		Mar. 20-21 1970	Soil Compaction
6.	Eighteenth Annual Conference on Soil Mechanics and Foundation Engineering of University of Minnesota	Minneapolis	March 26 1970	
7.	Eighth Annual Symposium on Engineering Geology and Soils Engineering of Idaho State University	Pocatello, Idaho	Apr. 1 - 3 1970	
8.	State-of-the-Art Conference on the Design and Installation of Pile Foundations and Cellular Structures - Lehigh University	Bethlehem, Pa.	Apr. 13-15 1970	
9.	Sixth Annual Seminar of Metropolitan Section of ASCE	New York	Apr. 13-14 and May 5 - 6, 1970	Field observations in Foundation Design and Construction
10.	Fifth Specialty Conference of the SMFD	Ithaca	June 22-24 1970	Lateral Stresses in the Ground and the Design of Earth Retaining Structures
11.	ASTM Symposium	Toronto	June 26 1970	Sampling of Soil and Rock
12.	Nineteenth Annual Meeting of the Clay Minerals Society	Miami	Oct. 13-17 1970	
13.	First Kentucky Soil Mechanics Group Seminar	Lexington	Oct. 16 1970	Building Foundations, Design and Construction
14.	Thirteenth Annual Meeting of the Association of Engineering Geologists	Washington	Oct. 20-23 1970	
15.	Twelfth U.S. Symposium on Rock Mechanics	Rollo, Mo.	Nov. 16-18 1970	
16.	Fifth Conference on Drilling and Rock Mechanics	Austin, Texas	Jan. 5 - 6 1971	
17.	SMFD-ASCE Symposium	Phoenix, Arizona	Jan. 13-14 1971	Underground Rock Chambers
18.	Fiftieth Annual Meeting of the Highway Research Board	Washington	Jan. 18-22 1971	
19.	Earth Systems Inc. Meeting	San Francisco	Feb. 17-20 1971	Foundations for Systems Building and Modular Housing
20.	Nineteenth Annual Conference on Soil Mechanics and Foundation Engng of University of Minnesota	Minneapolis	March 25 1971	

	Conference	Location	Date	Theme
21.	Ninth Annual Symposium on Engineering Geology and Soils Engineering of Idaho State University	Boise, Idaho	Apr. 5 - 7 1971	
22.	Twenty-second Annual Highway Geology Symposium	Norman, Oklahoma	Apr. 22-23 1971	
23.	Seventh Annual Seminar of Metropolitan Section of ASCE	New York	Apr. 26-27 and May 24-25 1971	Specifications for Foundation and Earthwork Construction
24.	ASTM Symposium on Underwater Soil Sampling, Testing and Construction Control	Atlantic City	June 27 and July 2 1971	
25.	Engineering Foundation Conference on Owner-Engineer-Contractor Relations in Tunnelling	Deerfield, Mass.	July 12-16 1971	Owner-Engineer-Contractor Relations in Tunnelling
26.	Twentieth Annual Meeting of the Clay Minerals Society and North American Clay Minerals Conference	Rapid City, S.D.	Aug. 8-12 1971	
27.	Thirteenth U.S. Symposium on Rock Mechanics	Urbana, Illinois	Aug. 30 and Sept. 1 1971	Stability of Rock Slopes
28.	Fourteenth Annual Meeting of the Association of Engineering Geologists	Portland, Oregon	Oct. 19-22 1971	
29.	Fifty-first Annual Meeting of the Highway Research Board	Washington	Jan. 23-26 1972	
30.	Conference on Rapid Penetration of Terrestrial Materials	College Station, Texas	Feb. 1 - 3 1972	Rapid Penetration of Terrestrial Materials
31.	Tenth Annual Symposium on Engineering Geology and Soils Engineering of Idaho State University	Moscow, Idaho	Apr. 5 - 7 1972	
32.	Symposium on Application of the Finite Element Method in Geotechnical Engineering	Vicksburg, Miss.	May 1 - 4 1972	
33.	ASCE and AIMMPE Conference on Rapid Excavation and Tunnelling	Chicago	June 5 - 7 1972	
34.	ASCE Conference on Performance of Earth and Earth-Supported Structures	Lafayette, Indiana	June 12-14 1972	
35.	Fourteenth U.S. Symposium on Rock Mechanics	University Park, Pa.	June 12-14 1972	New Horizons in Rock Mechanics
36.	ASTM Symposium on Evaluation of Relative Density Test on Cohesionless Soils in the Field and in the Laboratory	Los Angeles	June 25-30 1972	Evaluation of Relative Density Tests
37.	Twenty-first Annual Meeting of the Clay Minerals Society	Woods Hole, Mass.	Sept. 11-14 1972	
38.	ASCE Environmental Engineering Meeting - SMFD Session	Houston	Oct. 16-20 1972	Soil Dynamics
39.	Fifteenth Annual Meeting of the Association of Engineering Geologists	Kansas City	Oct. 24-27 1972	Underground Storage and Construction
40.	International Conference on Microzonation for Safer Construction	Seattle	Oct. 30-Nov. 3, 1972	
41.	Second Vanderbilt University Conference on the Application of Finite Element Methods in Civil Engineering	Nashville	Nov. 16-17 1972	
42.	Sixth Conference on Drilling and Rock Mechanics	Austin	Jan. 22-23 1972	

	Conference	Location	Date	Theme
43.	Fifty-second Annual Meeting of the Highway Research Board	Washington	Jan. 22-26 1973	
44.	Twenty-second Annual Soil Mechanics and Foundation Engineering Conference - University of Kansas	Lawrence, Kansas	March 16 1973	Legal Aspects of Foundation Engineering Practice
45.	Twenty-first Annual Soil Mechanics and Foundation Engineering Conference	Minneapolis	March 22 1973	
46.	Eleventh Annual Symposium on Engineering Geology and Soils Engineering	Pocatello, Idaho	Apr. 4 - 6 1973	
47.	Engineering Foundation Conference on use of Shotcrete for Underground Structural Support	South Berwick, Maine	July 15-20 1973	Shotcrete for Underground Support

Note: Further details on these meetings may be obtained from the Secretary of the U.S. National Society.

The ASCE through its SMFD has continued the Terzaghi Lectures and the Terzaghi Award, both of which were established in 1963. Terzaghi Lecturers since the Seventh Conference have been:

Stanley D. Wilson in 1969
T. William Lambe in 1970
John Lowe III in 1971, and
Bramlette McClelland in 1972.

Terzaghi Awards in the same period have been made to:

Ralph B Peck in 1969
Laurits Bjerrum in 1971, and
H. Bolton Seed in 1973.

APPENDIX VII

AUSTRALASIAN REPORT

Vice President's Report 1969-73

The major change in the organization of the Australian and New Zealand Societies, the two societies comprising the Australasian Region, that has taken place in the period under review is that both have altered their statutes so that they act as national societies of the International Society for Rock Mechanics as well as the ISSMFE. Recently both societies have also agreed to act as natural societies of the International Association of Engineering Geology. The affiliation with both ISRM and ISSMFE was taken as an opportunity to dispense with the over-lengthy SMFE title and both societies have selected the title Geomechanics although this can be regarded as entirely synonymous with the term Geotechnical as commonly employed in Europe. The suitability of the change in name of course remains with the additional affiliation to the IAEG.

The broadening of the scope of the societies has brought an increase in membership and has encouraged the active participation in the Societies' activities by engineering geologists and experts in rock mechanics, both from the Civil and Mining Engineering sides. The consequent meeting of people with overlapping but not entirely common outlook has proved very stimulating at both conferences and local meetings at which technical papers have been delivered. Particularly is this the case of the Australian Geomechanics Society which is jointly sponsored by the Institution of Engineers of Australia and the Australasian Institute of Mining and Metallurgy. In New Zealand, where mining activity is of lesser importance, the Geomechanics Society, like the previous Soil Mechanics Society, remains under the sole sponsorship of the New Zealand Institution of Engineers but nevertheless, by its broadened scope, has brought a number of engineering geologists into its fold.

Both Societies have found the combining of soil and rock mechanics very successful and fully support current moves of the ISSMFE towards co-ordination with the ISRM and IAEG and perhaps consider it unfortunate that such moves were not made earlier and directed more closely towards amalgamation.

The main joint activity of the two societies of the region are the holding of regional conferences every four years timed to take place half way between International SMFE Conferences. The last was held in Melbourne in 1971 and was rendered even more successful than usual by the attendance of members of the ISSMFE Executive following its meetings in Sydney. The Australian Society took great pleasure in playing host to the Executive and perhaps obtained some of the benefits of hosting an international conference without incurring the long months of hard work associated with such conferences. The next Australian New Zealand Geomechanics Conference will be in July 1975 in Brisbane. Preparations for this conference are well under way.

A supply of cards publicising this conference has been sent to the Organizing Committee for the Moscow Conference for distribution to members of that conference in the hope that even more visitors from overseas than for previous Australasian Regional Conferences, will be encouraged to attend the Brisbane Conference.

Both societies hold evening meetings at which technical papers are presented, such meetings being the responsibility of local groups or branches of the Societies centred on the major cities. The Sydney and Melbourne Groups for example, hold approximately nine such meetings per year. Short conferences and one-day symposia on special topics are also organized both by the local branches and, for the more important ones, by the National Committees. With the inclusion of rock mechanics and mining engineering, the number of such short conferences and symposia has increased in Australia to about four per year.

The New Zealand Society publishes "New Zealand Geomechanics News" which contains articles and précis of technical papers given at meetings of the society together with news of local and overseas activities.

Through the Institution of Engineers of Australia, the Australian Society publishes the Australian Geomechanics Journal. The Society has recently formed an editorial panel for this journal with the aim of maintaining as high a standard of papers as possible. It is hoped that the journal will achieve the same international recognition as journals of some other national societies.

E.H. Davis.

APPENDIX VIII

REPORT OF THE VICE-PRESIDENT FOR EUROPE

The Vice-President of a region has to report on the activities of the different national societies of his region during the last four years.

However, during the elapsed period the European Societies have suffered losses of such eminent members that they constitute major, although very sad events in the life of these societies, and therefore the audience will understand that I have to start my report with a duty of pious commemoration of those we have lost.

I have first to evoke the memory of a past president of our society, Dr Laurits Bjerrum, whose sudden death, while he was in full activity, has been a severe shock for all those who knew him personally. It was in London, where he would have attended the Rankine Lecture and also delivered a lecture at Imperial College, that, at the zenith of his life, Dr Bjerrum was taken away from us. He was the beloved disciple of Terzaghi, and in the masterly way he could deliver his lectures, he was the disciple who remembered best all the exceptional qualities of the founder of Soil Mechanics. Also the kindness of his personal contact, and the way he was able to conduct a discussion with the utmost friendliness, without conceding any erroneous deduction or statement, always reminded me of Terzaghi. For the International Society on Soil Mechanics, especially for the European Region and the Norwegian Geotechnical Society, the death of this extraordinary scientist has been a very great loss.

The Norwegian Geotechnical Society has decided the establishment of a Laurits Bjerrum Memorial Foundation. The Foundation's income shall be used to further geotechnical research. We are very thankful to the Norwegian Geotechnical Society for this initiative and for the possibility given to private companies and to the official institutions to contribute by donations to the creation of this Foundation to the memory of Dr Bjerrum.

The Polish National Society regrets the death of one of the pioneers of Soil Mechanics, Professor Pietowski, who attended practically all International Conferences of our Society, including the first one at Harvard in 1936.

With the Russian Society we regret the death of Professor Beresantsev, whose original contributions in our field are known and used the world over.

A short time after the Mexican Conference, the Belgian Society registered the loss of an eminent member, Professor Verdeyen.

Another tragic event during this period of four years was the unexpected death of Professor Roscoe, shortly after he delivered one of the most remarkable Rankine Lectures. He formed the Cambridge School of Soil Mechanics, from which a great many scientists have issued, who now continue the work of Professor Roscoe over the whole world.

Shortly after the European Conference on Soil Mechanics at Madrid, we were informed of the death of Professor Szechy, one of the most eminent scientists of the Hungarian School, which has done so much in the field of Soil Mechanics. The magisterial book of Professor Szechy will remain as a memory of this charming and most eminent personality.

The climax of the activities of a Region is of course its regional conference. The Fifth European Conference on Soil Mechanics and Foundation Engineering was held in Madrid in April 1972. This conference, which was honoured by the presence of the President, Professor Peck, was a real success.

The Spanish Society should be congratulated for the perfect organisation of the Conference, for its high scientific standard, and for the perfect publication of the Proceedings. Unhappily shortly before the Conference the Spanish Society had to announce the death of Professor Escario, chairman of the Organizing Committee, and one of the world-famous scientists in the field of Road Construction. It was very sad that Professor

Escario was not given the opportunity to see the success of his talent for organization. The subject of the European Conference was 'Structures subjected to Lateral Forces' and all aspects of this problem were perfectly covered in the different sessions of the Conference. The topics were:

Session I	General theories of earth pressures
Session II	Stability of rigid structures
Session III	Stability of flexible structures
Session IV	Construction problems and case histories.

The meetings were held in a building which can be considered as a perfect example of what a Congress building should be. The Spanish Organizing Committee, and especially Professor Jimenez Salas, should be thanked for the scientific standing of this Conference.

The now classical Rankine Lectures of the British Society were respectively given by:

the 10th Rankine Lecture in 1970 by the late Professor Roscoe: 'The influence of strains in 'The influence of strains in soil mechanics'.

the 11th Rankine Lecture in 1971 by Professor Jaeger:
'Friction of rocks and the stability of rock slopes'.

the 12th Rankine Lecture in 1972 by Professor Rowe:
'The relevance of soil fabric to soil investigation practice'.

the 13th Rankine Lecture in 1973 by Professor Lambe:
'Predictions in soil engineering'.

All these lectures have been published in the Journal 'Geotechnique'.

In Great Britain there has further been in 1970 a Conference on the behaviour of piles, organized by The Institution of Civil Engineers. While mentioning this conference, it is worthwhile to stress that it is not always easy to prevent a certain overlapping of conferences and subjects, due to the initiative of institutions which are not directly affiliated to our International Society.

In 1973 the British Geotechnical Society organized a symposium on Field Instrumentation.

The German Society "Deutsche Gesellschaft für Erd- und Grundbau" organized its biennial "Baugrundtagungen" in Düsseldorf in 1970, and in Stuttgart in 1972. The reports of these conferences, which were attended by a great many scientists and technicians have been published. The great advantage of the German Baugrundtagungen is that they not only focus attention on theoretical and laboratory problems, but they also pay attention to the practical aspects.

The "Société Française de Mécanique des Sols" organized in May 1972 the "Journées françaises de Mécanique des Sols" about the very important subject 'Comportement des sols avant la rupture - Behaviour of the soil before rupture'. At this conference scientists of practically all French speaking nations were present. It is worthwhile to stress that this conference was honoured by the attendance of Professor Caquet.

In October 1969 the Czechoslovak Committee for Soil Mechanics and Foundation Engineering, organized in Prague a Conference on 'New advances in Soil Mechancss'. Among others a lecture was delivered at that conference by the much lamented Dr Bjerrum 'The young Terzaghi and his way to soil mechanics', and a tribute was paid to the memory of Professor Brinch Hansen.

At that occasion a memorial tablet was unveiled. placed on the house where the founder of Soil Mechanics, Professor Karl Terzaghi, was born.

Among smaller countries, a very active one in the field of Soil Mechanics is Yugoslavia.

In 1969 in Sarajevo an international symposium was organized on 'Civil Engineering Structures resting on soil and rocks'. The contributions to this symposium have been published by the Academy of Sciences and Arts of Bosnia and Hercegovina, Department of Technical Sciences, Sarajevo.

The 12th National Conference of the Yugoslav Society for Soil Mechanics and Foundation Engineering was held in Split in 1971, and the 20th Anniversary of this Society was commemorated in Bled the same year.

Another very active country is Hungary.

In October 1971 there was in Budapest a symposium on moisture measurement, followed by the European Danube Conference on Soil Mechanics and Foundation Engineering, which was a real example of perfect organization and a plain success. The next "Donau-Europäische Konferenz" will be held in Bled (Yugoslavia) in June 1974.

As in many countries there is only one national society covering the fields of Soil Mechanics, Rock Mechanics and Engineering Geology, it is often difficult to determine if the symposia or conferences they organize belong more to the field of our International Society, than to the other two.

The Austrian Society hold Colloquia each year in October in Salzburg. For instance the 19th Colloquium was devoted to the problem of 'Moderne Stollen- und Tunnelbau unter besonderer Berücksichtigung maschinellen Vortriebes'.

The Polish National Society organized in 1970 in Lodz a scientific seminar on 'New Problems in the field of Soil and Rock Mechanics'.

Although I always have to look in the documentation to know if Turkey belongs to the European or Asian Region, it appears, after looking, that it is the duty of the European Vice-President to report that in 1971 was held in Istanbul a Symposium on engineering properties of weathered and jointed rocks. Furthermore on the occasion of the International Conference in Moscow, the Department of Civil Engineering of the Bogaziçi University at Istanbul organizes an International Seminar on Soil Mechanics and Foundation Engineering in the memory of Professor Terzaghi.

The Sweizerische Gesellschaft für Bodenmechanik und Fundationstechnik organized an International Symposium for underground openings in Luzern in September 1972. The annual meeting of this society in 1969 was devoted to the 'Influence of vibrations on foundations and supporting soil'.

The Associazione Geotechnica Italiana had its Conventual Meeting in Milano in 1973.

As always the Scandinavian Societies have been very active. The Swedish National Society organized in 1969 several symposia, namely, one on soil sampling, also in 1969, and one on morains (Morän).

The Scandinavian Geotechnical Meeting was held in Trondheim (Norway) in August 1972 and was organized by the Norwegian Geotechnical Society.

In connexion with the Moscow Conference the Swedish National Society organized a Symposium on Soil Structure on the 1st and 2nd August 1973.

In principle the initiatives of the National Societies, which are intended to have a more than national audience, should be brought to the attention of the regional vice-president and get his approval. However, this is not always easy as the initiatives are not always taken by the affiliated national societies, but often by other bodies (Academies, Universities, other Societies). In order to obtain a better organization it is strongly recommended that members who know of a given initiative should inform in good time the regional vice-president.

Of course the vice-president can only report the activities which are brought to his attention by the national societies involved. I am quite aware that several other activities other than those mentioned in this report have been taken by the societies. The Secretary General has drawn to the attention of the secretaries of the National Societies that they should send a report of the activities to their regional Vice-President. However, few societies have followed the suggestion of the Secretary General.

Besides special initiatives, the national societies have held local meetings and organized special lectures. It is however impossible to enter into such details.

Although until yet in Rumania does not exist a national society on Soil Mechanics and Foundation Engineering affiliated to our International Society, I received an invitation for the 2nd Conference on Soil Mechanics and Foundation Engineering, organized in Bucaresti in 1972, by the National Council of Engineers. This Conference was devoted to 'Foundation problems in special soil conditions'. It was to be regretted that Rumania, a country in which outstanding work is done in the field of soil mechanics, was not affiliated to our national society. However during the month of July I was advised that Rumania has submitted its application to be a member of the International Society on Soil Mechanics and Foundation Engineering.

The Komitee für Bodenmechanik und Grundbau in der Deutschen Demokratischen Republik has submitted in due course an application to become a member of our International Society. It has already organized in Dresden in November 1972 an international symposium concerning 'Sohldruckverteilung unter Flachengründungen bei besonderer Berücksichtigung der Bauwerksteifigkeit' - 'Distribution of soil reactions underneath foundation rafts, with special consideration of the rigidity of the building'.

With acceptance of this application, the number of affiliated Societies belonging to the European region will increase from 23 to 24; this is more than half the total number of societies all over the world.

With the approval of the regional vice-president, the Swedish National Society will hold in June 1974 at Stockholm a European Symposium on Penetration Testing, and the British Geotechnical Society will hold a conference in Cambridge from 2nd to 4th April 1974 on the problem of the settlement of structures.

Of course, the European Region is very proud that the U.S.S.R. National Society has accepted to organize the 8th International Conference on Soil Mechanics and Foundation Engineering. The Russian Society has done a tremendous work in preparing this conference. As however, the Conference is not a regional but an international event, the only duty of the vice-president is to mention this initiative taken by the Russian Society.

The VIth European Conference on Soil Mechanics and Foundation Engineering will be organized by the Austrian Society of Soil Mechanics and Foundation Engineering, backed by the Austrian Association of Engineers and Architects. It will be held in Vienna in March 1976, on the occasion of the 50th anniversary of the publication of the book of Professor Terzaghi 'Erdbaumechanik auf Bodenphysikalischer Grundlage'. The theme of the Conference will be 'Deep foundations and deep excavations'. Topics of the sessions will be:

Session 1: Deep excavations: Stability of temporary and permanent slopes - Dewatering problem-slurry walls, walls with secant piles - bracing; freezing technique.

Session 2: Deep foundations: Tunnelling.

Session 3: Deep foundations in open pits - Pile foundations - Caisson foundations.

During the past four years the opportunity was offered to me to tighten my personal contacts with many national societies and distinguished colleagues. I always appreciated the spirit of friendship and cordiality

which exists between the members of our International Society, not only between the older ones who still remember the time of the foundation of our Society by Professor Terzaghi, but also between the younger members.

Prof. Dr ir E. DE BEER.

APPENDIX IX

REPORT OF THE VICE-PRESIDENT FOR AFRICA

M. Pimentel dos Santos

The main event during the period was the 5th Regional Conference for Africa on Soil Mechanics and Foundation Engineering. The meeting was held in Luanda, Angola from the 23rd to the 28th August 1971 and was followed by an excursion from 29th August to September 4th.

A short review of the relevant aspects of the Conference is attached.

The activities of the National Societies of Morocco, Republic of South Africa and Rhodesia are object of short reports also attached.

During the period Ghana has organized his National Society.

In what concerns both Angola and Mozambique, the most relevant activities were based upon the Civil Engineering Laboratories of Luanda and Lourenço Marques in which a number of lectures and technical courses had been carried out. As it is known, members of the International Society resident in those territories are member of regional groups of the National Portuguese Society.

5th REGIONAL CONFERENCE FOR AFRICA ON SOIL MECHANICS AND FOUNDATION ENGINEERING

1 - Venue and date of the Conference

The 5th Regional Conference for Africa on Soil Mechanics and Foundation Engineering took place in Luanda, Angola (Portuguese West Africa), at the Laboratório de Engenharia de Angola from the 23rd to the 28th August 1971.

The presentation and discussion of papers filled 15 working sessions, two sessions per morning and two per afternoon.

2 - Participants

89 national and foreign delegates participated in the Conference, with 33 persons accompanying. From South Africa there were 41, of whom 7 were accompanying; Australia 3, one accompanying; Brasil 4, 2 accompanying; U.S.A. 2, one accompanying; England 1; Portugal 58, 21 of whom accompanying; Malawi 1; Ghana, Tanzania and Jamaica had announced their intention of attending and enroled, however at the last moment their delegates were prevented from coming to Angola for personal or professional reasons. However Ghana took part with three papers.

3 - Opening the Conference

The opening session was presided over by his Excellency, the Minister of Overseas Territories, Professor Dr. Joaquim Moreira da Silva Cunha, attended by his Excellency the Governor General of Angola, several Provincial Secretaries, the Director General of Public Works and Communications and the Chairman of the 5th Conference Engineer Henrique Novais-Ferreira.

4 - Themes Papers and Respective Discussions

4.1 - The work of the Conference occupied five days, comprising 15 working sessions, 2 per morning and 2 per afternoon.

The Conference was organized so as to cover geotechnical problems of outstanding importance which were grouped into 5 themes namely:

Theme 1 - Tropical and sub-tropical unstable soils
Theme 2 - Tropical and sub-tropical concretionary
Theme 3 - Stresses deformation of soils foundation
Theme 4 - Earthworks
Theme 5 - Road and slope erosion calculation of same

4.1.1 - Tropical and sub-tropical unstable soils

8 papers* were submitted for this theme, 4 from South Africa, 3 from Portugal and 1 from the U.S.A. The papers dealt with problems relative to the identification of expansive soils and evaluation of their behaviour, origin of cracking caused by the volumetric unstability, and correlation between geological

* - vide index of papers.

characteristics and geotechnical properties.

The General Reporter was W.R. Mackechnie from Rhodesia, the panel comprised Van der Marwe, Rhodesia, K. Knight, South Africa, J.A. Horta da Silva, Portugal, Milton Vargas, Brasil and A.A.B. Williams, South Africa. The sessions were chaired by L.C. Wilson of South Africa, J.M.F. Meireles of Portugal and B.A. Kantey of South Africa.

Apart from panel members, contributors to the discussions were made by Aitchison of Australia, B.A. Kantey, G.W. Donaldson, L.Webb, L.C. Wilson, R. Maud and A.A. Williams of South Africa, and B. Martins and Novais-Ferreira of Portugal.

In view of the discussion, it was considered to be relevant to progress in this particular field, to know the orientation of soil cracking and diaclase. Aitchison drew attention to the need for future investigation to be directed towards the mechanics of cracked media and not of continuous media.

There was considerable discussion of the problems included in the double-oedometer test, concluding that this test, evolved years ago by Knight continues of practical value, but much less for investigation. Knight, Kantey, Barreiros Martins, Webb, etc., took part in this debate. The difficulty in reproducing the range of stress in the laboratory, plus the fact of the expansion or the collapsing settlement being done under complete soaking imposes certain limitations.

The question of subdividing the pore pressure into various components was only raised by Horta da Silva, despite the General Reporter having raised it as of great importance for future investigation. Moreover control of suction throughout the oedometer test seems a sine qua non for progress in the study of unstable soil behaviour.

With an easy identification of expansive soils in mind by their plasticity index and clay percentage in accordance with the graph published by Van der Merwe in 1964, and taking into account the problem of the occurrence of expansive soils with activity < 0·5 as discussed by Wilson, Horta da Silva proposed the use of the ultimate activity concept. In this new approach IP is determined from values for w_L and w_P, both determined with the dispersive aqueous solution used to determine the clay percentage.

4.1.2 - Tropical and sub-tropical concretionary soils

Nine papers* were submitted for this theme, one from South Africa, two from Ghana, four from Portugal, one from Rhodesia and one from the U.S.A.

The papers concerned with matters that relate to geological characteristics of concretionary soils, their fundamental geotechnical properties and their use as construction materials and foundation substratum.

The General Reporter was Mountain from South Africa, with panel members F. Hugo and R.R. Maud, South Africa, J.M.F. Meireles from Portugal, C.P. van der Merwe, Rhodesia and B.S. Persons, U.S.A. The sessions were chaired by Novais-Ferreira and A. Rosinha, Portugal, and for H.G. Geed, Rhodesia.

Apart from the panel members, the following contributed to the discussion: B. Watt, J. Gregg, Burgers, P.A. Lendin, K. Knight, South Africa, P.G. Wilson, Australia, Milton Vargas, Brasil, and Novais-Ferreira, Portugal.

In view of the controversy arising from the terminology used by different delegates, the General Reporter commented on this, especially concerning ferruginous concretionary soils other soils discussed were silicious and calcarious concretionary soils, Mountain calling attention to the behaviour of gypsoferous soils in roads, which in his opinion formed a fourth type of concretionary soils. The problem of auto-stabilization of concretionary soils was a further point of discussion.

During the debate contributions centred largely on the terminology problem giving rise to even more confusion. In face of this confusion, Burgers idea of the creation of a committee for various participating countries to standardise nomenclature, was aposite.

Due to the General Reporters' inability to attend the closing session this was chaired by Knight, who agreed that he himself found that the controversy supported Burgers suggestion, and that confusion seemed to spread to auto-stabilization as well.

4.1.3 - Stresses and deformation in soils. Foundations

Seven papers* were submitted one from Portugal, four from South Africa, one from Thailand and one combined paper Swedish-American.

The papers dealt with problems relating to the clay percentage and shear strength, effects of the stress path and of the overconsolidation ratio on the shear strength by vane tests, consolidation characteristics of altered tropical clays; foundations on expansive clays and elastic plastic and visco-elastic behaviour of foundations.

The General Reporter was A. Barreiros Martins, Portugal, and panel members were Aitchison, Australia, Novais-Ferreira, Portugal, Webb and Hugo, South Africa, and Milton Vargas, Brasil. The session were chaired by Pimentel dos Santos and J.C. Boavida, Portugal, and Mohamed, Malawi.

Apart from the panel members G.W. Donaldson, B. Watt, MacRobertson, L.C. Wilson, H. Weber, and O.K. Steffer from South Africa, E. Brand from Thailand, and A.M. Falcão, Portugal, contributed to the discussions.

*. - Vide index of papers

In view of the nature of the papers and the current state of the art, it was felt aposite to discuss problems of stress coefficients in soil, their measurement and use in planning foundations, numerical methods for evaluating stress and deformation in foundation soils, non elastic and non-linear elastic properties of african soils, structural characteristics of sub-bases and pavements, buried and surface foundations, load-bearing capacity and the correlation between calculated and actual results by observation of the ground.

Aitchison contribution bears mention as to methodology in the study of characteristics and tensile-deformation states in soils, and Watt's mention of the intricate problems with residual soils as well as of the limited value in geotechnical parametres such as plasticity, activity, consolidation, etc., in the light of classical soil mechanics. There was diverse and intense controversy over the latter point. As well as these matters, which took up most of the sessions, it should be mentioned that Webb presented a simples method for calculating subsidence inside embankments, and Donaldson dealt with friction in piles.

4.1.4 - Earth works

Only three papers* were received on this theme, one from Brasil, one from the U.S.A. and one from South Africa, and only three sessions were given to it.

The papers dealt with survey of cracked slopes stability design of embankments in tropical countries and geotechnical properties of residual soils originated by alteration of basalts.

The General Reporter was A. Burgers of South Africa, with panel comprising G.W. Donaldson, D.J. Watt and K. Knight, South Africa, W. Mackechnie, Rhodesia, and J.A. Horta da Silva, Portugal. The sessions were chaired by Milton Vargas, Brasil, and J.S. Gregg, South Africa.

There was discussion by Mac Robertson, K. Steffen, B.A. Kantey, A. van Schalkwyk, L.C. Wilson, from South Africa, E.W. Brand, Thailand, Aitchison and P.G. Wilson, Australia, Milton Vargas and C. Nieble, Brasil, and A. Woods, Rhodesia, as well as from panel members.

Each session covered a discrete theme, namely stability of slopes and small earth dams. For the former the General Reporter proposed discussion of various problems related to simplified calculation of road-slopes embankments and gradients, and recognition of soils liable to strength degradation through problems of site-geology, compaction of earth-works, stability, and alterability, of rock-fills were discussed.

The General Reporter wound up by saying that he thought there had been insufficient time to discuss two so important themes in one. Watt gave an interesting summary of the present level of knowledge on analytical methods based on work by Muller, Hook, Jennings, etc., and including the problem of discontinuous media.

Robertson dealt with problems of geological discontinuities, stressing that before choosing an adequate analytical method, one must interpret the geological and geomorphological factors deemed important for each case, and define the ground's most probable slip-potential surface. Nieble discussed the problem of alterability of rocks, which is considered to be a subject of great importance. In earth-dams, the case being smaller ones only, Aitchison, Williams and Wood mentioned problems of cation-exchange in certain soils, tests for rate of sodium absorption and for cases of failure due to deflocculation of compacted soils caused by varying electrolitic concentration, a problem already touched on by Horta da Silva.

4.1.5 - Road and slope - erosion

Ten papers* were received on this theme, three from South Africa, one from Brasil, two from Ghana, two from Portugal, one from Rhodesia and one British-South Africa papers, which totalled three sessions.

The studies presented dealt with matters relating to stabilization of soils with lime and cement, influence of climatic conditions on the design of pavements, the use of cells for measuring stresses in roads, strength of bases for flexible pavements, behaviour of pavements and correlation between the clay percentage, CBR and density.

The General Reporter was Pimentel dos Santos, Portugal, and the panel was J.S. Gregg, R.A. Smith, and H. Todres, South Africa; R.W. Mackechnie, Rhodesia; J.M.F. Meireles, Portugal. The sessions were chaired by G. Sharp, Rhodesia, K. Knight, South Africa, and M. Falcão, Portugal.

From the floor, H.K. Gell, C.P. Van der Merwe, Rhodesia; A.B. Williams, K.A. Clauss, F. Hugo and P.A. Loudon, South Africa; Novais-Ferreira and Carlos Silva, Portugal; Aitchison, Australia; Milton Vargas, Brasil; and M.S.F. Brown U.K., also contributed to the discussion.

Based on the nature of the papers, the General Reporter suggested related problems of lime stabilization and of erosion, for discussion.

There was discussion by J.M.F. Meireles, Carlos Silva, Novais-Ferreira and Milton Vargas on the erosion problem, dealing with particular cases in Angola and Brasil. Aitchison dealt with the influence of climatic conditions on soil prospecting and pavement calculation including a generalized comparative term, soil suction.

The remaining discussion covered aspects of design and performance of pavements, not going specifically into lime stabilization except in the case of short reference by Loudon. Williams stressed compaction problems, especially with collapsing soils, and the use of pressure-cells in determining soil stresses. Novais-Ferreira dealt with aspects of the use statistics in soil mechanics.

* - Vide index of papers

5 - Conclusions of the 5th Conference.
Norms for drawing up general reports

Work finished on August 28th 1971. The closing session was chaired by Eng. Manuel Pimentel dos Santos, aided by Engrs. Kantey, Mackechnie, and Novais-Ferreira.

Eng°. Novais-Ferreira spoke first as chairman of the organising committee, giving delegates the conclusions of the ad hoc committee, as follows:

1) - nomination of new vice-chairman for Africa - that the nomination be made at the next International Conference de Soil Mechanics in Moscow, 1973, Dr. Graft-Johnson of Ghana was proposed, the national society of that country having been recently admitted;

2) - venue of the next Regional Conference - after discussion the South Africa National Society for Soil Mechanics and Foundation Engineering undertook to organise the next Regional Conference, and to choose time and place as soon as possible;

3) - vocabulary for laterites - Eng.° Burgers proposed the setting up of a study group to draw up vocabulary for laterites, lateritic soils and ferralitic soils. The delegates agreed with this.

6 - Post-Conference Excursion

Upon closure of the Conference work, some delegates and their companions took part in an excursion from August 29th to September 4th, 1971. Visits were made to see roads on lateritic soils in the Quibala-Cela-Nova Lisboa area, roads on expansive soils at Catete, Benguela, Novo Redondo, and foundations in expansive soils.

Visits were also made to a concrete dam (Cambambe) and an earth dam (Gove), the latter in the Nova Lisboa area.

Annex - Index of papers

Tropical and Subtropical unstable soils

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G.E. Blight A.A.B.Williams South Africa	Cracks and Fissures by Shrinkage and Swelling, pp.1-15
I.J.A.Brackley, South Africa	Partial Collapse in Unsaturated Expansive Clay, pp.1-23
J.A. Horta da Silva, Portugal	Geology and Engineering Behaviour of Expansive Clay from Cazenga Region-Luanda, pp.1-31
J.A. Horta da Silva, Portugal	Relationships between the collapsing soils of the Luanda and Luso Regions, pp.1-41
W.J. Morin, U.S.A.	Properties of African Tropical Black Clay Soils, pp.1-51
M.J. Azevedo Macedo, Portugal	Contribution for the Study of the Red Soils of the City of Lourenco Marques, pp.1-61

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R.R. Maud, South Africa	The Occurrence and Properties of Ferricretes in Natal, South Africa, pp.2-3
C.P.Van der Merwe, Rhodesia	The Properties and Use of Laterites in Rhodesia, pp.2-7
G. Soares de Carvalho, Portugal	Geology of Materials Used in Highways Construction that run Through the Planations Surfaces of the South of Angola, pp.2-17
B.S. Persons, U.S.A.	Evaluating the Characteristics of Marine Non-Clastics to Support Heavy Foundations, pp.2-23
J.M. Ferreira Meireles, Portugal	Mechanical Effect on Geotechnical Properties of Lateritic Soils, pp.2-33
A.M.da Costa Antunes, Portugal	Iron and Clay Content and the Geotechnical Identification of Laterites, pp.2-37
W.J. Morin, U.S.A. and J. Ayetey, Ghana	Formation and Properties of Red Tropical Soils, pp.2-45
M.D. Gidigasu, H.S. Bhatia, Ghana	The Importance of Soil Profiles to the Engineering Studies of Laterite Soils in Ghana, pp.2-55
J.A.P. Gomes Teixeira, Portugal	Lateritic Soils of the Cela Region-Mineralogy and Geotechnical Classification, pp.2-61.

Stresses and Strains in Soils Foundations

H. Novais-Ferreira, Portugal	The Clay Content and the Shear Strength in Sand Clay Mixtures, pp3-3
P.C.Curtayne, H.A.Todres, South Africa	Investigation and Correlation of Parameters Determining Structural Properties of Subgrades, pp.3-11.
Robert D.Holtz, Sweden and Raymond J. Krizek, U.S.A.	Effects of Stress Path and Overconsolidation Ratio on the Shear Strength of a Kaolin Clay, pp.3-17
G.E. Blight, South Africa	Can in Situ Stress Ratios be Estimated by Means of the Vane Shear Test, pp3-27

G.W. Donaldson, South Africa	Foundations for a Pipeline over Expansive Soil, pp.3-33
Brian J. Watt, South Africa	Elastic, Elastoplastic and Viscoelastic Behaviour in Foundations, pp.3-43
Edward W. Brand, Surinda Kanjanophas, Thailand	The Consolidation Characteristics of Weathered Tropical Clay, pp.3-51

Earthworks

A. Mac G. Robertson, South Africa	Accounting for Cracks in Slope Stability Analysis, pp.4-3
E.S. Smith, U.S.A.	Embankment Design Experience in Tropical Countries, pp.4-11
Paulo T. Cruz, Carlos M. Nieble, Brasil	Engineering Properties of Residual Soils and Granular Materials Originated from Basalts-Capivara Dam-Brasil, pp.4-19

Roads and Slope Erosion. Design, Strengthening and observation of road pavements. Effects of climate.

J.W. Vail, South Africa	Soil Stabilization Reactions with Dolomitic Lime, pp.5-3
J.de Medina, Brasil	Some Considerations on Climatic Factors in Pavement Design, pp.5-9
A.A.B. Williams, South Africa and S.F. Brown, Great Britain	The use of earth pressure cells in some road experiments, pp.5-15
M.van Rooyen, South Africa	The effect of a foaming agent on the compaction properties of a sandy soil, pp.5-23
R.L. Mitchell, Rhodesia	The strength of bases for flexible pavements, with reference to Overlays, pp.5-29
H.Novais-Ferreira, Portugal	Clay content in soil and the correlation between CBR and density, pp.5-35.
R.A.L.M. Santareno, Portugal	Cement content in soil-cement. Correlation of values determined by wear and failure criteria, pp.5-43
P.C. Todor, U.S.A., and S.L.Yeboa, Ghana	Pavement deflection and performance in Ghana, pp.5-49
R.S. Levinson, U.S.A. and A.K.Castel, Ghana	Stabilization of three lateritic gravels from Ghana, pp.5-55
K.A. Clauss, P.A. Loudon, South Africa	The influence of initial consumption of lime on the stabilization of South African Road materials, pp.5-61.

RAPPORT SUR LES ACTIVITES DU COMITE MAROCAIN DE MECANIQUE DES SOLS ET DES ROCHES DEPUIS 1969

Depuis 1969, les activités du COMITE MAROCAIN DE MECANIQUE DES SOLS ET DES ROCHES ont été réparties sur:

1/L'organisation de conférences techniques
2/L'organisation de visites géotechniques sur des sites de grands chantiers du Maroc.
3/La préparation de communications du Maroc pour diverses manifestations internationales de mécanique des sols
4/L'examen de propositions de sujets de recherche appliquée intéressant la mécanique des sols.

1 - ORGANISATION DE CONFERENCES

Le Jeudi 23 Octobre 1959 sous la présidence de Monsieur CHAMI, Directeur de l'Hydraulique, a eu lieu à CASABLANCA, une conférence présentée par Monsieur SABARLY, Président Directeur Général de la Société Géoconseil, sur:

"Les conceptions modernes de l'étanchéité et du drainage dans les projets de barrage"

Le 16 Decembre 1969 sous la présidence de Monsieur KANOUNI, Chef du Service de la Voie et des Ouvrages D'Art à L'Office National des Chemins de Fer, Monsieur VIDAL a fait à CASABLANCA une conférence agrémentée d'un film sur:

"La terre armée"
(Conception et possibilités offertes dans le génie civil)

Le Mardi 13 Janvier 1970 sous la présidence de Monsieur GHISSASSI Secrétaire Général du Ministère des Travaux Publics, Monsieur BERRADA, Directeur de l'Administration des Eaux et Forêts a fait une conférence dans l'amphithéâtre de l'Institut Agronomique Hassan II à RABAT sur:

"Les procédés de lutte contre différentes formes d'érosion dans diverses régions du Maroc"

Le 13 Juin 1970 une conférence sur le gonflement des sols argileux a été présentée par Monsieur MARIOTTI à SAFI à l'issue de la visite géotechnique de cette ville.

Le 10 Décembre 1970 conférence à RABAT à l'Institut Agronomique de Monsieur BACHELEZ, Directeur de l'Equipement à l'Aéroport de PARIS, sur le thème:

"Construction de l'aéroport de ROISSY-EN-FRANCE - problèmes de mécanique des sols et de géotechnique routières"

Conférence placée sous la présidence effective de Monsieur GHISSASSI, Secrétaire Général du Ministère des Travaux Publics.

Le 26 Janvier 1971, conférence à CASABLANCA de Monsieur BIAREZ, Professeur de Mécanique des Sols à la Faculté des Sciences de GRENOBLE, sur le thème:

"Réflexions sur quelques exemples de glissement de terrain et d'accidents de fondation d'ouvrages"

Conférence placée sous la présidence de Monsieur BEL HADJ, Ingénieur en Chef des Ponts et Chaussées, Chef de la Circonscription du Nord des Travaux Publics et Président du C.M.M.S.R.

Le 29 Avril 1971, conférence à CASABLANCA de Monsieur COMES, Ingénieur chargé des études géotechniques à la Direction de l'Equipement de l'Electricité de France, sur:

"Etude géotechnique et géologique des grandes centrales souterraines'

Conférence placée sous la présidence de Monsieur DOUIEB, Directeur de la Géologie au Ministère du Commerce, de l'Industrie et des Mines.

Le 17 Mai 1972, à l'hôtel de la Tour Hassan à RABAT, Monsieur MARCHAND, Directeur au Maroc du Bureau d'Etudes Coynes et Bellier, a présenté une conférence sur:

"La philosophie du traitement des fondations de barrage à l'appui de quelques exemples et à l'appui notamment de l'example du barrage des AIT AADEL"

Le 11 Janvier 1973, conférence à CASABLANCA de Monsieur LEHUEROU KERISEL, Président Directeur Général du Bureau d'Etudes Simecsol, sur le thème:

"Etat actuel des connaissances de la mécanique des sols - lacunes et progrés"

Conférence placée sous la présidence de Monsieur BEL HADJ, Secrétaire Général du Ministère des Travaux Publics.

II - ORGANISATION DE VISITES GEOTECHNIQUES

a) Au cours de l'année1969 a été organisée une visite du chantier du barrage en terre des AIT AADEL sur l'oued Tessaout. Au cours de cette visite ont été exposés notamment tous les problèmes posés par la fondation de cet ouvrage et par la sélection et la mise en place des matériaux du corps du barrage. Rappelons que ce barrage est constitué par un noyau central à axe vertical en limons argileux doléritiques; les recharges latérales à l'amont et à l'aval sont constituées d'alluvions grossières.

A l'occasion des essais de mécanique des sols entrepris pour définir les qualités mécaniques des limons du noyau imperméable un programme de recherches a été entamé sur le thème:

"Estimation et dissipation des pressions interstitielles dans les limons compactés au cours de la construction du barrage"

b) Au cours de la même année 1969 a été organisée une visite géotechnique de la ville de SAFI; des problèmes de fondation se posent dans cette ville où le sol est constitué sur une forte épaisseur par des marnes surconsolidées expansives qui sont le siège de gonflements importants.

c) Au cours du mois de Décembre 1970 a eu lieu une visite géotechnique sur le chantier de la nouvelle piste d'envol de l'aérodrome de TANGER; au cours de cette visite un exposé a été fait par Monsieur MARIOTTI sur le comportement des "tirs" marocains (sols assimilables aux black cotton soils).

d) Le 31 Mars et le 1er Avril 1971 ont été organisées des visites des deux grands chantiers de barrages du Sud (barrage en béton de MANSOUR EDDHABI sur l'oued Drâa et barrage en terre de YOUSSEF BEN TACHFINE sur l'oued Massa prés d'AGADIR).

III -

Notre comité national a d'autre part participé à diverses manifestations internationales (colloques, symposia et congrés) au cours desquelles il a presenté less communications suivantes:

a) "Le processus d'essais d'altération des roches tendres sous étreinte contrôlée - critères d'altérabilité'

par Messieurs CHAOUI, MARIOTTI et ORLIAC, communication présentée au colloque géotechnique de TOULOUSE en 1969.

b) "La construction du barrage en terre du Grou sur les terrasses fluviatiles quaternaires récentes"

par Messieurs BENISTY et TONNON, communication présentée au congrès de MONTREAL les 29 et 30 Mai 1970.

c) "Caractéristiques de déformabilité et de résistance au cisaillement de marnes indurées par mesures in-situ"

par Messieurs CHAOUI, MARIOTTI et ORLIAC, communication présentée au congrès de BELGRADE du 21 au 26 Septembre 1970.

d) Notre comité a également préparé une série de cinq communications géotechniques à la Deuxième Conférence Routière Africaine.

IV -

Notre comité national a enfin examiné la sélection de programmes d'études à caractère de recherches dont les sujets sont les suivants:

a) Fondations sur sols de faible portance:
Etude de l'efficacité de couches granulaires confinées par des armatures métalliques (principe de la terre armée) pour la diffusion des contraintes en profondeur.

b) Fondations sur sols surconsolides expansifs:
Contrôle de la répartition réelle des réactions du sol sous les semelles d'un bâtiment reposant sur sols expansifs au cours du développement du potentiel de gonflement.
Caractéristiques mécaniques et coefficient de sécurité à adopter vis-à-vis des réactions résultant de la libération du potentiel de gonflement.
Contrôle expérimental des forces de traction développées dans le fût de fondations sur pieux traversant des couches expansives; efficacité des moyens pour les supprimer.

c) Fondations de ponts:
Etude de la profondeur des affouillements dans les lits de rivière intervenant pendant les crues.

d) Etude générale des phénomènes d'érosion de la Zone Nord et étude de la stabilité des pentes dans les formations argiloschisteuses de cette région.

REPORT ON THE ACTIVITIES OF THE SOUTH AFRICAN NATIONAL SOCIETY FOR THE PERIOD JULY 1971 - JULY 1973

COUNTRY	Republic of South Africa
NAME OF THE SOCIETY	Division of Soil Mechanics and Foundation Engineering of the South African Institution of Civil Engineers
NUMBER OF MEMBERS	Approximately 420

CONFERENCES

The 5th Regional Conference for Africa on Soil Mechanics and Foundation Engineering held in Luanda in August 1971 was attended by 33 South African delegates who submitted 14 papers.

The 6th Regional Conference for Africa on Soil Mechanics and Foundation Engineering is being organised by the South African National Society and is planned to be held in Durban in September 1975.

SPECIAL ACTIVITIES

Prof. V. de Mello of Brazil gave an address on "A State-of-the-art on the Standard Penetration Test" in July 1971.
A Colloquium on "Design of High Road Fills" was held in June 1972.
A Workshop Session on "Urban geotechnical data banking" was held in February 1973.
A Course on "Stability of rock slopes" was held in February 1973.
Dr. J.L. Sherard of USA gave an address on "Some problems in earth dams" in April 1973.

PUBLICATION

Members of the Society participated in the drawing up of a Code of Practice for "Lateral support of surface excavations".

REPORT FROM RHODESIA 1969-1973

The Rhodesian National Society is the Geotechnical Division of the Rhodesian Institution of Engineers non-members of the Institution being admitted to the Society as Participants.

The Division's membership has slowly increased during the period, the number now being about 220 Engineers, Scientists, Technicians and Participants. However, possibly only 10% of this number are actively practising in the Soil Mechanics field, the remainder having only a passing interest.

Some 30 evening meetings have been held in Salisbury, with occasional repeat lectures in other cities. Half of the meetings have been formal and the lectures published in 'The Rhodesian Engineer'. Report-backs have been given on international conferences in the field.

Most lectures have been given by members, with possibly 30% by visiting specialists (mostly on the highway aspects of Soil Mechanics and Geotechnology).

Due to the small numbers of practitioners, local symposia have not been convened. Considerable support was given to the Fourth Regional Conference in Angola, and a contribution was made to the Haifa Conference on Expansive Soils. It is regretted that the lack of visas prevented our representation at the Moscow Conference.

APPENDIX X

REPORT ON ACTIVITIES IN SOUTH AMERICA IN THE PERIOD 1969-1973. G. PEREZ-GUERRA, VICE-PRESIDENT, S. AMERICA

Several important events took place in the region of the Vice-Presidency, namely:

1 - Fourth Pan-American Conference held in San Juan de Puerto Rico in 1971.

2 - Founding and establishment of the Latin-American Geotechnical Magazine in 1971.

3 - Organization and admission into the International Society of the Chile National Society in 1971.

4 - Second Peru National Conference in 1970.

5 - Fourth Brasil National Conference in 1970.

6 - Second Argentina National Conference in 1970.

7 - Venezuela Lecture Series in 1972.

1 - FOURTH PAN-AMERICAN CONFERENCE

Pan-American Conferences are realized every four years, in between the years of the International Conferences. The first was held in Mexico City in 1959, the second in Brasil (Rio de Janeiro, Sao Paulo, Belo Horizonte) in 1963 and the third in Caracas in 1967. Puerto Rico was elected as the seat of the fourth, it being organized as a joint effort of the Soil Mechanics and Foundation Division of the American Society of Civil Engineers, the Puerto Rico Chapter of the ASCE and the Institute of Engineers, Architects and Surveyors of Puerto Rico.

The Conference was held June 14-18 1971, at the Hotel San Juan in San Juan de Puerto Rico. It was attended by 350 registrants and over 150 guests from twenty seven countries, seven of them outside of the American continent. Both Professor Ralph B. Peck, President of the International Society and Mr G. Pérez-Guerra, Vice-President for South America, attended the Conference. Dr Peck presided over the Opening Session and acted as 'discusser-at-large' in all technical sessions. Mr Pérez-Guerra presided over the Closing Session and Business Meeting of the Delegates. The key-note address was delivered by Professor T. William Lambe of M.I.T.

The theme of the Conference was 'Performance of Earth Structures and Foundations', divided into six technical sessions. A seventh, non-technical, session was held, on 'Business and Practice of Foundation Engineering'.

The Proceedings of the Conference were published in three volumes by the American Society of Civil Engineers. The first two volumes were distributed at the Conference and the third appeared in 1972. Volume I contains state-of-the-art reports on the six technical sessions; Volume II, papers submitted on the theme of the Conference; and Volume III, discussions, session VII and other activities.

2 - LATIN-AMERICAN GEOTECHNICAL MAGAZINE

The first proposal for a regional periodical publication on soil mechanics and foundation engineering was made at the Second Pan-American Conference in Brasil, in 1963. The Venezuela National Society had started in 1960 publication of a Bulletin. From 1960 to 1972 there have appeared thirty-eight issues of the Bulletin, forty to seventy pages each, with technical papers and society news. Owing to it being the only active periodical technical publication in the region, it was proposed in Brasil to make of that bulletin the divulgation organ of technical and social activities of Latin-America but the proposal was never implemented.

In 1970 the Mexico National Society re-activated the idea of a regional publication on a Latin-American basis, i.e., all South-American national societies plus Mexico, which geographically is part of the North-American region. A lengthy consultation followed, conducted mainly by mail, complemented by personal visits of several delegates to countries of South America and Mexico. The Vice-President for North America, Dr D.H. MacDonald, was also consulted and offered valuable opinions and advice. As a result of the consultation all Latin-American national societies concurred in sponsoring a Latin-American Geotechnical Magazine as a regional technical periodical publication and designated Venezuela as publisher. The Magazine was to have a Director and four Advisors, plus a Publication Committee.

The first issue, corresponding to the second quarter of 1971, was presented to the IV Pan-American Conference in Puerto Rico. Within the program of that conference, the Latin-American delegates held a business meeting, presided over by the Vice-President for South America, in which matters related to the publication of the Magazine were considered, brought up to date and resolved upon.

By proposal of the delegates for Mexico, approved by the votes of the assembly, it was decided that the Magazine was to be fully bilingual, with versions of all papers both in Spanish or Portuguese and in English. The delegates also appointed Mr J.C. Hiedra López as Director, with residence in Caracas, Venezuela, and as advisors, Messrs. Oreste Moretto (Argentina), Victor F V de Mello (Brasil), Raúl J. Marsal (Mexico) and G. Pérez-Guerra (Venezuela). These appointments were made for the four-year period to the next meeting of the delegates which will take place at the Fifth Pan-American Conference in 1975 in Buenos Aires.

The first four issues of the Magazine were published with the financial help of the Venezuela National

Society, with the expectation that from its second year on the Magazine would pay its way through advertisements of an inter-American appeal and subscription from America and the rest of the world. This has not proved feasible with the result that the Director has not been able to publish the fifth issue, for which originals are ready for the printer. The Director has addressed a consultation to the sponsoring countries to get their views and suggestions on how to overcome these difficulties.

3 - CHILE NATIONAL SOCIETY

This new member of the International Society was admitted at the Sydney meeting of the Executive Committee, in 1971, by the unanimous vote of the delegates. The Vice-President for South America was charged with the pleasant duty of the Chile representation at the meeting, and on their behalf thanked the Committee for their admittance.

4 - SECOND PERU NATIONAL CONFERENCE

The conference took place in Lima in July 1970. The program was organized around the classical headings used in the past by International Conferences. Attendance was numerous with a high percentage of national engineers, with a certain number from other Latin-American countries.

5 - FOURTH BRASIL NATIONAL CONFERENCE

The Fourth Conference was realized at Rio de Janeiro in August, 1970. Five main subjects were considered: I - Research Techniques - Field and Laboratory; II - General Properties of Typical Soils; III - Earth Pressures and Retaining Structures, Deep Excavations, Subways; IV - Stability of Natural and Man-made Slopes; and V - Special Problems of Design and Construction. The conference was attended by a large number of Brazilian engineers.

6 - SECOND ARGENTINA NATIONAL CONFERENCE

The conference took place at the city of Córdoba in September 1970. The Proceedings of the First National Conference, held at the city of La Plata, were printed in 1971 and sample copies of the volume were circulated at the IV Pan-American Conference in Puerto Rico.

7 - VENEZUELA LECTURE SERIES 1972

The series consisted of nine lectures plus two round-table discussions delivered in eight meetings held in four successive weeks from mid-June to mid-July 1972. The series were organized by the Venezuela Soil Mechanics Society, the Venezuela Geological Society and the Venezuela Structural Engineering Society, under the sponsorship of the Venezuela College of Engineers. Its character was inter-disciplinarian and the maximum quota of 100 registrants was amply filled.

The lectures dealt with geological features of the city of Caracas, stability of residual soils, foundation criteria, soil-structure inter-action and seismic influence on foundation design.

ACTIVITIES OF THE VICE-PRESIDENT

The Vice-President attended the Fourth Pan-American Conference in Puerto Rico and presided over a business meeting of the delegates in which Buenos Aires was elected as the seat of the Fifth Pan-American Conference to be organized by the Argentina National Society in 1975.

He also attended the Sydney meeting of the Executive Committee of the International Society in August 1971, acting at the meeting as delegate for Chile and Venezuela.

In November 1972 the Vice-President visited Mexico upon the gracious invitation of the Mexico National Society and joined Prof. Peck and Dr MacDonald in attending the First Nabor Carrillo Lecture given by Prof. Arthur Casagrande. The Lecture is a bi-annual affair instituted to honour the memory of the great Mexican engineer.

The Vice-President had been invited to visit Ecuador on the occasion of the Second Ecuador National Conference which was scheduled for September 1970, and to give a lecture on expansive soils. This was not realized as the Conference was postponed.

During the period the Vice-President maintained frequent correspondence with the several national societies trying to keep up to date on their activities, relaying information received from the Secretary General or requested by them and promoting subscriptions and collaboration to the Latin-American Geotechnical Magazine and the Geotechnical Abstracts.

Some correspondence was also interchanged with the Argentine National Society on matters pertaining to the organization of the Fifth Pan-American Conference in Buenos Aires.

Contacts were made by mail with groups of engineers from the Dominican Republic, Guatemala and Panamá interested in organizing national societies. Ample information was given, providing copies of the statutes of the International and Venezuela Societies, procedures for becoming a member of the International Society and the option to be incorporated into the North America or South America regions.

The Secretary General has been kept informed yearly of the activities of the region and both mail and personal communication was maintained with the Vice-President for North America on matters related to the Latin-American Geotechnical Magazine and general policy of the International Society.

APPENDIX XI

REPORT ON ACTIVITIES WITHIN THE ASIAN REGION, by the ASIAN VICE-PRESIDENT

SOUTHEAST ASIAN SOCIETY OF SOIL ENGINEERING - Activities Report

1. Country - Southeast Asia.
2. Name of the Society - Southeast Asian Society of Soil Engineering.
3. Officers of the Committee:

President - Professor Chin Fung Kee
Secretary - Dr John D. Nelson

General Committee Members:

Mr Nasiruddin Yawar Babar	- West Pakistan
Dr Edward W Brand	- Thailand
Dr Sirilak Chandrangsu	- Thailand
Prof. Chin Fung Kee	- Malaysia
Mr Peter Lumb	- Hong Kong
Dr Chai Muktabhant	- Thailand
Dr John D. Nelson	- Thailand
Mr Jose C. Santos	- Philippines
Dr Tan Swan Beng	- Singapore
Mr Sawarso Wignjosajono	- Indonesia

4. Approximate number of members - 200.
5. Meetings or Conferences:
   (i) Fourth Southeast Asian Conference on Soil Engineering. To be held in Kuala Lumpur, Malaysia, April 7 - 10, 1975. Proceedings will be available.
   (ii) Third Southeast Asian Conference on Soil Engineering. Held in Hong Kong, November 6 - 10,1972. Proceedings not yet available.
   (iii) Fourth Asian Regional Conference on Soil Mechanics and Foundation Engineering, Bangkok, July 1971. Proceedings (U.S. $30).
   (iv) Proceedings of the First Southeast Asian Conference on Soil Engineering, Bangkok, 1967, are out of print, and the Second Southeast Asian Conference on Soil Engineering, Singapore, 1970, are still available at cost of U.S. $18.00
6. Society Publications - 'Geotechnical Engineering', Semi-annual journal in English. Free to members; U.S. $3.00 per year to non-members; U.S. $8.00 per year to libraries or organizations.
7. Special Activities and Remarks

Asian Information Center for Gectechnical Engineering (AGE). The idea of establishing the AGE was conceived at a meeting of the representatives of the national societies of the Asian Region held in Bangkok in July 1971. The representatives of the Southeast Asian Society were requested to explore the feasibility of such a project. The AGE was established within the library of the Asian Institute of Technology with funding through a grant from the International Development Research Centre of Canada.

To act as a clearinghouse in the Asian region for publications and information on all phases of geotechnical engineering such as soil mechanics, foundation engineering, rock mechanics, engineering geology, earthquake engineering, and other related areas, the Center will undertake the responsibility to collect all relevant information and data useful to the region, to design a computer-based information storage and retrieval system, and to disseminate such information through its publications and photoduplication services.

Among the regular publications planned are:

Asian Geotechnical Engineering Abstracts (Quarterly)

Asian Geotechnical Engineering in Progress (Semi-annual)

Asian Geotechnical Engineering Directory (Bi-annual)

AGE Current Awareness Service (Quarterly)
(List of new publications received at AGE and the table of contents of selected AGE journals)

AGE Journal Holding List (Annual)

AGE Bibliography Series (Irregular)

The Center, in addition to its publication projects, will also provide the following three-R services:

Reference service (for bibliographical questions)

Referral service (for technical questions)

Reproduction service (for photocopying or microfilming of required documents)

Detailed information concerning the Center and the availability of its services is contained in a descriptive brochure issued by the Center. All interested persons are invited to write for a complimentary copy of the brochure from the Director, AGE/AIT, P.O. Box 2754, Bangkok, Thailand.

ACTIVITIES OF THE INDIAN GEOTECHNICAL SOCIETY - PERIOD 1969 - 1973

1. Country - India
2. Name of the Committee - Indian Geotechnical Society
3. Officers of the Committee:

President	- Dr Shamsher Prakash
Secretary	- Shri C.V.J. Varma
Executive Committee Members:	Dr T. Ramamurthy
	Shri B.T. Nagrani
	Shri H.C. Verma
	Prof. B.V. Ranganatham
	Dr B.K. Ramiah
	Prof. B.K. Kaul
	Dr Suresh P. Brahma
	Dr K.E. Agarwal
	Shri S.N. Gupta
	Dr Gopal Ranjan
	Dr M. Venkataratnam

4. Approximate number of members - 900
5. Meetings or Conferences - A Technical Session on the subject of Soil Mechanics is held every year. Its proceedings are published in English.
6. Society Publications: (i) Indian Geotechnical Journal issued quarterly in English. Available at a cost of U.S. $12 by surface mail or U.S. $24 by air mail, per year.
   (ii) I.G.S. Newsletter issued quarterly.
7. Special Activities: (i) Symposia on 'Shallow Foundations' was arranged at Bombay in December 1970. Its proceedings are available from its publishers at a cost of $20 by surface mail or $30 by air mail.
   (ii) Symposium on 'Behaviour of Earth and Earth Structures subjected to Earthquakes and Dynamic Loads' was organized in March 1973 in Roorkee. This symposium was jointly sponsored by Indian Society of Earthquake Technology and University of Roorkee.
   (iii) Special lectures are arranged for the members of the Society whenever foreign experts on the subject of soil mechanics and foundation engineering are available for delivering such lectures.

ACTIVITIES OF THE ISRAEL NATIONAL SOCIETY DURING THE PERIOD 1971 to 1973

1. Country - Israel
2. Name of the Society - Israel National Society of Soil Mechanics and Foundation Engineering.
3. Officers of the Society:

President	- Joseph G. Zeitlen
Secretary	- G. Kassiff
Executive Committee Members:	J.G. Zeitlen
	G. Kassiff
	G. Wiseman
	A. Komornik
	Z. Getzler
	M. Katzir
	E. Zolkov.

4. Number of Members: 110
5. Meetings or Conferences

February 1971:	Symposium on Pile Foundations, Tel-Aviv
December 1972:	Presentation of Papers Submitted to the Moscow Conference, Tel-Aviv.
March 1973:	Symposium on Environmental Effects on Swelling Clay Subgrades - Tel-Aviv.
July 1973:	3rd International Conference on Expansive Soils -Technion City, Haifa.

6. Society Publications:
   Proceedings of the 3rd International Conf. on Expansion Soils, Vol.1, July, 1973. Price: $50. - (2 volumes).

7. Special Activities:
   - Preparation in final form of the draft of the Foundations Code of Practice.
   - Participation in the Committee on Earthquake Code of Practice.
   - Study group on penetration resistance practice and equipment.

ACTIVITIES OF THE JAPANESE NATIONAL COMMITTEE DURING THE PERIOD 1969 TO 1973

1. Country - Japan
2. Name of the Committee: Japanese National Committee on Soil Mechanics and Foundation Engineering.
3. Officers of the Committee:

Chairman	- Hideo Fukuda
Secretary	- Kenji Ishihara
Executive Committee Members:	Toshinobu Akagi, Masami Fukuoka, Yorihiko Osaki, Kano Hoshino, Fusayoshi Kawakami, Hideaki Kishida, Yasunori Koizumi, Junichi Miyako, Hiroshi Mori, Sakuro Murayama, Akio Nakase, Takashi Watanabe, Hakuju Yamaguchi, Yoshiaki Yoshimi.

4. Approximate Number of Members: 350
5. Meetings of Conferences:
   The activities of the Japanese National Committee are incorporated with those of the local Society, the Japanese Society of Soil Mechanics and Foundation Engineering, to which the National Committee is attached.

   (i) Proceedings of the 2nd Asian Regional Conference on Soil Mechanics and Foundation Engineering are still available at the cost of U.S. $20.00.

   (ii) Research Conference on Soil Mechanics and Foundation Engineering and Symposium on some specific topics, are held each year, and the proceeding published in Japanese.

6. Society Publications:

   (i) "Soils and Foundations". Quarterly journal in English, U.S. $5.00 per year.

   (ii) "Tsuchi to Kiso (Soil Mechanics and Foundation Engineering)" Monthly journal in Japanese.

7. Special Activities and Remarks:

   (i) Cooperative work has been done to integrate the Japanese Industrial Standard with several specifications on the part of soil mechanics and foundation engineering.

   (ii) Several study groups organized in the Society have been actively working toward making up manuals to be used by Practicing engineers and research workers. The manuals hitherto put forth involve Sampling manual (in English), Manual for laboratory soil testing, and Manual for in-situ investigation, all published in Japanese. They are available for those who pay necessary dues.

   (iii) Symposia, as follows, sponsored fully by the Society or jointly with other engineering societies were held during the period under review.
   a. The 2nd Joint Symposium on Rock Mechanics. Nov. 1970, Kyoto, Japan.
   b. The 3rd Japan Earthquake Engineering Symposium. Nov. 1970, Tokyo.
   c. International Symposium on Land Subsidence.
   d. The 2nd US-Japan Joint Symposium on Soil Dynamics.
   e. Symposium on Tunnel.
   f. Symposium on Treatment of Soft Soil Grounds and its

Efficiency.

g. Symposium on Lateral Earth Pressure on Flexible Walls.

(iv) Slide Committee established in the Society has been active in collecting a number of colored slides related primarily with laboratory testing of soils, and in-situ investigation of construction sites. The best series of these were selected, arranged and reproduced. They are being used preferably for demonstrating students or engineers what is to be typically worked out in the field of our profession. The sets of slides can be purchased from the Society.

(v) Information Committee set up in the Society has been actively working on establishing an information collection and retrieval system, dealing exclusively with the information within the country.

8. Other Committee's Activities:

a. The Committee undertook a drive to increase its membership and had an addition of about 180 new members. The drive is still under way and will see more people join the Committee.

b. Review has been made of the Committee's statutes and the up-to-date version developed is consistent with the Constitution and By-laws of the International Society as well as those of the local Society, the Japanese Society of Soil Mechanics and Foundation Engineering, to which the National Committee is attached.

APPENDIX XII

REPORT OF COMMITTEE ON DEFINITIONS, SYMBOLS AND TERMINOLOGY

1. Title of Committee

The title of the committee seems to be a matter of some doubt. The title given above is that used by the secretary in writing to me but the title given in the agenda is 'Committee on Symbols & Units'. Other variants have appeared in different places. Now that the major item of the revision of the word lists for the lexicon has been completed, as reported below, it might be helpful to the future committee for the executive to consider the title and perhaps even to state terms of reference.

2. Specialty Session on Terminology and Definitions in Soil Mechanics, Mexico 1969

The first task undertaken was the organization of the Specialty Session on 'Terminology and Definitions' at the International Conference in Mexico in 1969. This session was chaired by Prof. Kerisel, the writer acting as secretary.

A very short report on this session was written for inclusion in the Proceedings of the conference. Later a transcript of the tape recording of the session was made and a copy was offered to everyone who was present at the session or who had corresponded with the secretary about the session. Copies of this transcript are still available. As no funds were available this was the most we could do.

Several matters arising from the session are still to be dealt with by the committee (see below).

3. International System of units (S.I.)

A matter within the duties of the sub-committee, which was first raised by Dr.Northey of New Zealand, is which system of units should be used by the International Society. Dr.Northey pointed out that when New Zealand, Australia and Great Britain changed from the foot, pound, second (f.p.s.) system they would use the 'Systeme International' (S.I.). This is not the same as the centimetre, gram, second (c.g.s.) or the metre, kilogram, second (M.K.S.) systems used by most countries which have used the metric system of units for years. There are two differences. In the S.I. the kilogram is used as a unit of mass, and the Newton is the unit of force (and therefore comes into the units of stress and pressure), a Newton being that force which will give a mass of one kilogram an acceleration of one metre per second per second. The second difference is that the S.I. uses multipliers of 10^3 and 10^{-3} to move from one unit to the next greater or smaller e.g. 1 km = $1m \times 10^3$

1 gm = $1kg \times 10^{-3}$

Our Society must adopt some standard (if interim) policy on the use of units.

A letter was circulated to the Chairmen of all National Committees asking what the situation was or was likely to be in their country. Sixteen replies were received one of which was simply a formal acknowledgment.

Two countries stated unequivocally that they are now using S.I. only. They are Britain and Ireland, Poland stated that S.I. will be obligatory after 1972.

Six countries are committed to S.I. but with reservations, and six countries which are already 'metric' state that they have no intention of changing their present practice in the near future, i.e.they will continue to use c.g.s.or M.K.S.with force measured in kgf or kiloponds or metric tonnes and pressure in kgf/cm^2 or tonnes/m^2.

The reservations referred to above are of interest. Spain says S.I. is legal and is to be taught in schools, but c.g.s. and m.kp.s. units are also compatible with the law. Spain refers to c.g.s. as only 'a subsystem of the S.I.' I do not think this is basically true. France suggests giving both units on graphs and also expresses a preference for the 'bar' as a unit of pressure, one bar being equal to one decanewton per cm^2. West Germany says S.I. units must be used by law from 1977, but refers to the difficulty of finding 'handy multipliers for the basic unit 'Newton' which should be such as to give conventional figures in conventional statical computations', and says 'Another point, of course, will be how readily engineers will accept new units'. South Africa is committed to S.I. and 'will be completely metricated by the end of 1973', - they say further however 'it is considered by the engineering profession that in practice, for the foreseeable future engineers will use kilograms for force and kg/cm^2 or tonnes/m^2 for stress' New Zealand agrees that S.I. units should be promoted, but points out that the use of a given system of units is really a matter of personal preference and that all a society can do is to recommend the S.I. units to its members. Portugal says that the tendency in their country is to maintain S.I. and derived units like kilograms force and kgf/cm^2 and ton/m^2.

Of those countries which will remain c.g.s. or M.K.S. (i.e. NOT S.I.), Turkey does not expect a change in the near future, Hungary is deliberately using c.g.s. and M.K.S. units and awaits the introduction of 'Newtons' and everything that has to come along with that. Finland will continue to use the c.g.s. system for the time being but expects the new generation will automatically shift over to S.I. as does U.S.S.R. Czechoslavakia uses S.I. with 'one important deviation', which is that supplementary units are used in Civil Engineering practice. These are pond, kilopond and megapond for force and kp/m^2 and Mp/m^2 for pressure, and p/cm^3 and kp/m^3 for unit weight. Japan and Greece see no sign of change from the c.g.s. and M.K.S. systems.

The picture for the future is one of confusion. Clearly we are going to have with us in Civil Engineering both the S.I. and M.K.S. system for some considerable time in the future. Problems are the size of the Newton (which is small), the 10^3 multiplier, which becomes 10^6 for areas and 10^9 for volumes, and the need to find conveniently sized S.I. units for force and stress.

One fact is clear; only North America is now using the f.p.s. system and Canada is committed to change to the S.I. Further the metric system has been legal in U.S.A. since 1866 and the metre and kilogram have been the legal standards of length and mass since 1893.

Although it seems that S.I. will eventually win, the sub-committee recommends to the executive committee that the f.p.s. system not be used in the activities of the International Society in future, but that as an interim measure, all quantities be given in the S.I. or M.K.S. units. In the case of force or stress, both S.I. and M.K.S. units be given, but 'kilogram' should not be used as a unit of force, 'kilogram weight' or 'kilopond' being used. 'Bar' as a unit of pressure is acceptable.

The matter should be reconsidered at a suitable future time.

4. Fourth Edition of Eight Language Lexicon

The eight language lexicon, produced through three editions by the Swiss National Society is a major contribution to our subject.

Several workers have pointed out however that some of the translations are not correct in all languages. In many cases this arises because the English word has more than one meaning.

The committee has completed the task of compiling a basic word list in English. This list contains 1590 words compared to 1633 in the third edition. However many new technical words have been added, but all non-technical words which can be found in a general dictionary have been deleted.

Where an English word can be misunderstood or has two or more meanings, the word has been defined in English in all its meanings. These definitions have been sent to the translators. The idea is that the definition should be translated into French (say) and the appropriate French word be picked to represent this meaning. The definitions will not be published. Some of them are open to criticism, but they serve their one purpose.

The preliminary suggested word lists contained many words of local usage or from related disciplines. Each committee member gave his opinion on each word in these lists. Many of these words were deleted based on the consensus of opinion.

The final word lists represent the result of many painstaking hours of work by the committee members.

The translations into the languages other than English are being made by nominees of the appropriate national committees except for German and Swedish which are being done by Prof. Schultze and Mr. Sandegren respectively who are both members of the committee.

The translations into French, German and Russian have been completed, though some final typing remains to be done.

The Swedish translations are well advanced. We understand that the Spanish translations are completed but we have not yet received all of them. We have some of the Portuguese translations. We have no information on the Italian translations.

This matter is of some urgency to our Russian colleagues and it would be appreciated if the executive could bring it to the attention of the national committees concerned.

The committee has carefully considered the question of what languages should be included in the lexicon. A case can be made for including Dutch, and either or both of Czech and Polish. We have discussed this with many friends and it is generally agreed that none of the existing languages should be dropped. If new languages are added, then the format must be changed since there is no room for additional languages within the existing format. These decisions presumably must be taken by the executive committee in conjunction with the Russian National Committee who have undertaken to print the fourth edition.

5. Matters outstanding

Certain matters proposed by Prof. Kerisel in his report in 1969 have not yet been formally adopted.

Other matters are 1) a confusion between the terms s_u and c_u. Do they mean the same thing? 2) standardization of grading curves 3) a possible ambiguity in the use of the terms modulus and co-efficient 4) co-ordination of our terminology with that used in other disciplines, in particular rheology and heat flow, and 5) matter raised by Prof. Schultze of symbols proposed for quantities in soil mechanics by the International Organization for Standardization which conflict with the symbols already adopted by ISSMFE.

Correspondence on all outstanding subjects will be passed to the new chairman.

6. Conclusion

The present chairman retires at this point. I understand that the new chairman will be Prof. L. Jürgenson. I wish him and his colleagues well and thank the committee members who have worked with me, over the past four years for their efforts and their support.

HQG:jb
71088

Hugh Q. Golder
Chairman

APPENDIX XIII

REPORT TO VIIIth INTERNATIONAL CONFERENCE ON SOIL MECHANICS AND FOUNDATION ENGINEERING:

SUB COMMITTEE ON SOIL SAMPLING

At the VIIth International Conference in Mexico City, a discussion was arranged (as Specialty Session No.1) to cover the following topics:

1. The apparatus of soil sampling.
2. The procedures of soil sampling.
3. The logic of soil sampling (from the soil mechanics point of view) and
4. The quality of soil sampling.

Following the success of these discussions and the publication of the Proceedings of that Session (see Appendix A for list of titles of the 22 papers submitted), it was decided to make the theme for the period between the VIIth and VIIIth International Conferences that of 'Quality in Soil Sampling'. As the proposed first stage in this activity, a Specialty Session was arranged on this topic at the Fourth Asian Regional Conference on Soil Mechanics and Foundation Engineering. The topics to which contributions were invited were as follows:

1. The definition of sample quality.
2. The definition of processes to attain a specific quality in a soil sample in (i) technical terms, and (ii) contract specification and
3. The measurement of sample quality.

Sixteen papers were received (see Appendix B) and a useful discussion was recorded. The Proceedings have been published.

Despite the encouraging response to these Specialty Sessions and despite the evidence put forward in several of the papers to suggest that the highest quality in a soil sample was both predictable and attainable, the conclusion could be reached that there was barely enough enthusiasm - on a world wide basis - to sustain any further enquiry on this topic.

It became abundantly clear that in many countries (notably those in which the process of soil sampling follows the preparation of a specification, the calling of bids or tenders, and the acceptance of the most favourable bid - usually at the lowest price), the opportunities for achieving a high quality in soil samples are very limited. The whole technology of soil engineering has adapted itself to the often

uncritical nature of the soil samples available for study (as a consequence of the above process). In these circumstances, despite the potential for individual examples of high quality sampling coupled with subsequent studies, the engineering profession as a body appears to be quite satisfied with the status-quo.

The situation is rather different in the case of rock sampling for studies in rock mechanics. Here the profession is alert to the proper representation - in a sample - of features critical to rock behaviour and pertinent to a sample. However the field of rock sampling is not within the terms of reference of the sub-committee.

In the light of the discussions reported above it must *now be recommended that no further action should be taken to enquire into aspects of soil sampling relating to normal terrestrial soils.*

There is, however, one emerging aspect of soil mechanics in which the process of soil sampling is critical. This relates to the earthen materials of the sea floor (including any recently uplifted coastal areas). It appears that there could be considerable economic value in bringing forward at the earliest possible date, a state-of-the-art study together with research contributions on this topic.

It is recommended therefore that the attention of the Sub-Committee should be directed towards this area of study. It is proposed that, during the period between the VIIIth and the IXth International Conferences a Specialty Conference on the topic of 'Sampling of sub-aqueous earthen materials' should be convened. It is suggested that a possible date and venue for this Specialty Session could be in Hawaii in August 1974 (to coincide with the Circum-Pacific Energy and Mineral Resources Conference).

As chairman of the Sub Committee on Soil Sampling, I would be willing to convene such a specialty session at that time or on another occasion if more suitable.

It is my recommendation that this proposed activity should be of an *ad-hoc* nature only leading to a report at the IXth Conference. Following the presentation of this report on that occasion, the Sub-Committee should be disbanded.

July 1973 *G.D. Aitchison*

Appendix XIII - Appendix A

List of papers submitted to specialty session No.1 on Soil Sampling - VIIth International Conference on Soil Mechanics and Foundation Engineering Mexico 1969

Summary of replies to IGOSS Questionnaire on the State of the Art of Soil Sampling.

Proposal for "quality-classes" in soil sampling in relation to boring methods and sampling equipment
K.H. IDEL, H. MUHS and P.VON SOOS

A ramming technique for sampling non-lithified sediments.
A. DÜCKER and H.STADE

Method for extraction of undisturbed frozen cores A. DÜCKER

Sampling disturbance of soft marine clays T. BERRE, K.SCHJETNE and S.SOLLIE

The soil mechanics aspects of soil sampling in organic soils
T.KALLSTENIUS

The soil mechanics aspects of soil sampling in coarse soils
T.KALLSTENIUS

Sampling of bentonite-cement and of silt Y.LEBEGUE

A note on the soil mechanics aspects of sampling peculiar to embankment construction of soft clays
T.K. NATARAJAN and N.BANSI LAL

Soil samplers developed at the Central Building Research Institute
D. MOHAN and V.S. AGGARWAL

Sampling of very hard cohesive soil and very dense sandy soil with an improved Denison double tube sampler
S. SONE, C.TAKEMURA and S.TAJIMA

Sampling of loose saturated sands G. YAMADA and H. UEZAWA

Reducing disturbance in sampling stiff soils J.G. ZEITLEN and A. KOMORNIK

Sampling of lunar soil J.D. NELSON

Residual soil sampling practice in Brazil M. VARGAS

Snow mechanics aspects in snow sampling G. ABELE

Soil sampling in frozen ground K.A. LINNELL

Some undisturbed soil sampling methods and procedures used by the U.A. Army Engineer Waterways Experiment Station
A.L. MATHEWS

Soil anisotropy and soil sampling D. LAFEBER

Instrumentation of soil sampling operations J.G. LANG

Sub-aqueous sampling M. WOOD

Needed research on fundamental problems in soil sampling - discussion statement
M.J. HVORSLEV

General report of the Symposium on Soil Sampling, Osaka, Japan
M. FUKUOKA

List of papers submitted to specialty session 'Quality in Soil Sampling' - Fourth Asian Conference ISSMFE, Bangkok, July 1971

INFLUENCE OF SAMPLE DISTURBANCE ON SOIL PROPERTIES

The deformation of a soil sample during extrusion from a sample tube
S.SONE

Some aspects of sampling disturbance observed using a nuclear method
B. SHACKEL

The measurement of pore pressure during sampling K. SCHJETNE

Effect of sampling on some Loess characteristics D.M. MILOVIC

Forces on an open-drive sampler in stiff clay J.G. LANG

Secondary mechanical disturbance: Effects in cohesive soil samples
T. KALLSTENIUS

The predicted effect of soil sampling disturbance on the stresses and strains developed during triaxial testing C.M. GERRARD and L.J. WARDLE

MEANS OF AVOIDING OR ALLOWING FOR SAMPLE DISTURBANCE

Sampling of sand and moraine with the Swedish Foil Sampler
B.B. BROMS and A.HALLEN

Soil sampler for taking an undisturbed sample 66mm in diameter and with a maximum length of 17 metres
H.K.S.BEGEMANN

Performance of a device for sealing sample tubes J.C. HOLDEN

Some useful properties of soil to evaluate the sample quality of unsaturated volcanic ash
K.M. SAIKI

The measurement of disturbance in samples of soft clay
S.B. BROMHAM

The variation of mechanical properties of clay samples depending on its degree of disturbance
T. OKUMURA

The use of residual stress to define sample quality
J.D. NELSON, E.W. BRAND, Z.C. MOH and I.D. MASON

Evaluation of sample quality on undrained soil properties
P. RAYMOND, D.L. TOWNSEND and M.J. LOJKASEK

Influence of type of soil upon the accessibility of soil sample quality
P. von SOOS

Discussions

APPENDIX XIV

REPORT OF INFORMATION ADVISORY COMMITTEE TO INTERNATIONAL SOCIETY FOR SOIL MECHANICS AND FOUNDATION ENGINEERING
June 15, 1973

The Information Advisory Committee (IAC) met in Madrid, Spain, at the occasion of the European Regional Conference in April, 1972. This Committee, previously named the Abstract Liaison Committee, adopted the new name by resolution at Madrid and upon subsequent approval of the Executive Committee. The Minutes of that meeting are attached.

Since the Madrid meeting, considerable progress has been made as a result of the efforts of the IAC members. The first of these is the revision of the International Geotechnical Classification System (IGC). The revision is an outgrowth of several years of use of the IGC by Nils Flodin (Swedish Geotechnical Institute), Tin Jorstad (Norwegian Geotechnical Institute), and Herbert Kuhn (German National Society) with input and review by other members of IAC. The large task of coordinating and completing the Revised IGC was performed by Nils Flodin. The revision is made part of this report with the recommendation of IAC that it be accepted by the Executive Committee and adopted by ISSMFE. Mr. Flodin's comments are also included which will explain the nature of the changes and the need therefor (see revised version, May 1973, attached).

Progress has been made concerning the improvement and marketing of Geotechnical Abstracts/Geodex Retrieval System (GA/GRS), which was named the official information retrieval system of ISSMFE by Executive Committee action in Mexico in 1969. These efforts are primarily those of Willy Norup (GRS) and Herbert Kuhn (GA), with peripheral assistance from other members of IAC, President Peck, and Secretary Nash. The results of these efforts and cooperation are expressed in Mr. Norup's letter of April 12, 1973 which is made part of this report. The Committee is grateful to Dr. Peck and Dr. Nash for their interest and active support. Dr. Peck has prepared letters of endorsement of GA/GRS which have assisted in the sales promotion of this service, and Dr. Nash has assisted in supporting placement of advertisements at reduced rates. GA/GRS brochures have been mailed with the ISSMFE Directory with the cooperation of Dr. Peck and Dr. Nash.

Secretary Nash has attempted to enlist the assistance of the various national committees in promoting GA/GRS but has not received good response. IAC has been informed of United States National Committee cooperation via announcements in ASCE publications and obtaining of ASCE/SMFD mailing lists, but has not been informed of cooperation from any other national societies. IAC suspects that the major problem is one of lack of funds within the national committees to effect the required promotion. Nevertheless, this committee shares Dr. Nash's disappointment in the lack of cooperation of many of the national committees; the goals of 50% increase in subscriptions by the end of 1971 and 100% increase by the end of 1972 set by the Executive Committee have hardly been met. It has been necessary, therefore, to increase the subscription rate for the combined GA/GRS from $98 (U.S.) to $178(U.S.) in order to make this a self-supporting enterprise.

Several improvements are planned for the GA/GRS system, including increasing the number of key words for retrieval, preparing a manual concerning the use of the system, cross indexing of descriptors that are not key words, and improving the abstracting of paper discussions. If these things are to be done, assistance will be required of ISSMFE and the national committees to increase the number of subscribers. IAC recommends that the Executive Committee assist in the following manner:

1. Insert GA/GRS advertisements and announcements, free of charge, in directories and conference bulletins.
2. Updated national membership lists should be furnished to IAC, as soon as they become available, for use in promotion of GA/GRS.
3. Exert pressure on all national committees to endorse GA/GRS via their newsletters or technical publications.
4. Assist in obtaining reduced rates for advertisements in geotechnical journals (Secretary Nash has already given some assistance in this area).
5. Ask all conference organizers (International and Regional) to forward lists of participants and their addresses to IAC for use in promotion of GA/GRS.

It is hoped that the Executive Committee will find this report informative and constructive. The Information Advisory Committee looks forward to the Executive Committee's response and direction.

Respectfully submitted,

Joseph M. deSalvo, Chairman
Nils Flodin, Jacques Florentin, Ivan Sovinc,
H. Petermann, Herbert Kuhn, Willy Norup.

INTERNATIONAL GEOTECHNICAL CLASSIFICATION SYSTEM

(IGC) Revised Version May, 1973

PRINCIPAL GROUPS.

A GENERAL
B ENGINEERING GEOLOGY - Including descriptions and case records of natural processes concerning soils and rocks
C SITE INVESTIGATIONS - Equipment and techniques of exploration, sampling and field testing of soils and rocks (excluding determination of engineering properties)
D SOIL PROPERTIES: LABORATORY AND FIELD DETERMINATIONS - Concepts, theories, methods of determination, equipment and results.
E ANALYSIS OF SOIL-ENGINEERING PROBLEMS - Theoretical, empirical and practical methods of analysis
F ROCK PROPERTIES: LABORATORY AND FIELD DETERMINATIONS - Concepts, theories, methods of determination, equipment and results
G ANALYSIS OF ROCK-ENGINEERING PROBLEMS - Theoretical, empirical and practical methods of analysis
H DESIGN, CONSTRUCTION AND BEHAVIOUR OF ENGINEERING WORKS - Descriptions; case histories; syntheses of investigations, design, construction (including equipment) and behaviour
K CONSTRUCTION METHODS AND EQUIPMENT - Including improvement of soil and rock conditions
M MATERIALS OF CONSTRUCTION
S SNOW AND ICE MECHANICS AND ENGINEERING
T RELATED DISCIPLINES

A GENERAL

Main Divisions		Possible Subdivisions	
A01	Foundation, Soil and Rock Engineering - Scope	A01	General aspects Economical aspects Scope Relation to other sciences
A02	Historical Aspects	A02	Awards Biographies History Obituaries
A03	Bibliographies and Literature Classification	A03	Bibliographies Literature classification Information services Abstracts
A04	Textbooks, Handbooks and Geotechnical Periodicals	A04	Handbooks Periodicals Publication series Textbooks
A05	Nomenclature	A05	Definitions Descriptors Dictionaries Nomenclature Symbols
A06	Companies, Institutes, and Laboratories	A06	Companies Consultants Councils Firms Institutes Laboratories Annual reports
A07	Societies and Meetings	A07	Conferences Societies Committees Symposia Special lectures Conference proceedings Bulletins
A08	Professional Ethics, Legal Requirements, Codes of Practice and Standardization	A08	Accidents Bidding practice Building codes Calculated risks Codes of practice Ethics Legal requirements Liability Loss prevention Performance standards
A09	Education	A09	Universities and colleges Continuing education Geotechnical curricula

B ENGINEERING GEOLOGY Including Descriptions and Case Records of Natural Processes concerning Soils and Rocks.

Main Divisions		Possible Subdivisions	
B00	General		
B01	Soils and Rocks Formation	B01	Deposits - general features Deposits - special features Prospecting of deposits for special purposes Residual deposits Alluvial deposits Lacustrine deposits Marine deposits Glacial deposits Wind deposits Volcanic deposits

		Boulder deposits Organic terrain Geochronology Accumulation and removal of constituents Geologic periods aspects Geologic preloading Igneous rocks Sedimentary rocks Metamorphic rocks
B02	Hydrogeology	B02 Ground water origin and occurrence Fluctuations of ground water level Ground water types Ground water movements Water in rock fissures Quality of water Surface water features
B03	Mass Movements and Subsidence	B03 Slow soil flow, creep Solifluction Landslides Land subsidence
B04	Natural Catastrophes	B04 Earthquakes Floods Waves
B05	Climatological Features	B05 Frost fundamentals Permafrost features Arid land Tropical zones Subtropical zones
B06	Submarine Geology	B06 Submarine erosion Submarine sedimentation Submarine topography Turbidity currents
B07	Structural Geology	
B08	Extraterrestrial Geology	B08 Lunar geology Lunar soils
B09	Geomorphology and Terrain Classification	B09 Erosion, subaerial Exogenetic processes Slope development Terrain classification
B10	Mineralogy and Petrography	B10 Clay minerals Crystallography Mineralogy Diagenesis Metamorphism Petrography
B11	General Descriptions of Regional Soils and Rocks Conditions	B11 General geological - geotechnical maps

C SITE INVESTIGATIONS Equipment and Techniques of Exploration, Sampling and Field Testing of Soils and Rocks (excluding determination of engineering properties)

Main Divisions		Possible Subdivisions
C00	General	C00 Site investigations - planning Data storage and retrieval Quality requirements Site inspection Pre-construction field observations
C01	Airphoto Surveys	
C02	Geophysical Surveys	C02 Geophysical methods - general Seismic survey Electrical methods

			Gravity methods Magnetic methods Sonic methods Remote sensing Laser method
C03	Probings (Soundings)	C03	Dynamic probing Static probing Wash probing
C04	Exploratory Excavations		
C05	Boring Technique and Equipment and Recording of Results	C05	Boring technique - general Boring methods and equipment Coring technique Drill rigs and auxiliary equipment Boring platforms Recording of boring results, including down-hole techniques (boring logs) Submarine boring Drilling mud Horizontal-boring technique
C06	Sampling, Handling of Samples	C06	Sampling - general Handling of samples Sample quality requirements
C07	Measurement of Field Conditions	C07	General field instruments Deformation, settlement Inclinometer measurements Ground water table Ground water flow Tracer studies In situ stress Earth pressure measurements Pore-water pressures Recording of meteorological conditions
C08	Field Testing Excluding tests for engineering properties, see Groups D and F	C08	Seepage tests, pumping tests Plate bearing tests Pile load tests Rock drilling tests Blasting tests Full-scale load tests
C09	Reports on Site Investigations	C09	Reports Presentation of results Drawings Maps

D SOIL PROPERTIES: LABORATORY AND FIELD DETERMINATIONS — Concepts, Theories, Methods of Determination, Equipment and Results

Main Divisions		Possible Subdivisions	
D00	General	D00	Laboratory supplies General testing equipment General geotechnical testing
D01	Classification and Identification	D01	Soil classification Consistency limits, incl. water content Description of specific soils
D02	Physico-chemical properties	D02	Soil-water relationship Physical properties incl. electrical properties Chemical properties Corrosion Thixotropy Deterioration Dispersion Ageing effects Formation of quick clays Effects of organic components

D03	Composition, Structure and Density	D03 Soil composition Grain size, shape and surface area Grain size distribution Soil structure, fabric Porosity Density, degree of saturation X-ray analysis Differential thermal analysis (DTA)
D04	Permeability and Capillarity	D04 Fundamental flow properties Determination of permeability and capillarity Filter properties
D05	Compressibility	D05 Fundamental properties Compressibility and swelling Consolidation Oedometer tests Secondary time effects Repetitive loading
D06	Shear-deformation and Strength Properties	D06 Fundamental properties Stress-strain properties Shear strength Elastic properties Failure criteria Dilatancy Anisotropy Tensile tests Compression tests, incl. triaxial Residual strength Direct shear tests Visco-elastic properties Vane tests Sensitivity Fall-cone tests Static penetration test in laboratory Pore pressure Rheological features Field direct shear tests Resistance against cutting
D07	Dynamic Properties	D07 Blasting tests Vibration tests
D08	Thermal Properties	D08 Thermal properties Freezing properties
D09	Compactibility	D09 Fundamental properties Compaction tests Compaction test equipment
D10	Properties of Soil-Additive Mixtures	D10 Additives Soil mixtures Stabilized soils

E ANALYSIS OF SOIL-ENGINEERING PROBLEMS		Theoretical, Empirical and Practical Methods of Analysis
Main Divisions		Possible Subdivisions
E00	General	E00 Safety factors in general Model laws
E01	In Situ Stresses Caused by Gravity and Applied Loads and Excavations	E01 Basic theories Stresses caused by gravity Stress distribution from vertical loads Stress distribution from horizontal loads Stress distribution from inclined loads Contact pressures Elastic features Photo-elastic analysis
E02	Deformation and Settlement Problems	E02 Basic theories Settlement analysis Consolidation theories Secondary time effects Creep and plastic flow

		Preloading and unloading Settlements due to ground water lowering Regional settlements Settlement of piles and pile groups Settlements due to climatic conditions, vegetation, etc Settlements due to dynamic and repetitive loadings Consolidation by atmospheric pressure Heaving Anchor movements Swelling due to unloading
E03	Bearing Capacity of Soils	E03 Basic theories Bearing capacity of footings Foundation failure of embankments
E04	Bearing Capacity of Piles	E04 Basic theories Bearing capacity of individual piles Pull-out resistance Pile driving formulae and problems Bearing capacity of pile groups Piles and pile groups subjected to lateral forces Negative skin friction Evaluation of pile load tests
E05	Earth Pressure Problems	E05 Basic theories Earth pressure on retaining walls Earth pressure on temporary supports Earth pressure on free and anchored sheet piles Earth pressure on anchor plates Stability of double wall and cellular cofferdams Earth pressure on tunnels and shafts Earth pressure on conduits Silo pressure Water pressure, incl. from waves Wind loads
E06	Stability of Slopes, Fills, Cuts and Excavations	E06 Basic theories Stability of natural slopes Stability of cuts and excavations Stability of embankment and fill slopes
E07	Seepage and other Hydraulic Problems	E07 Basic theories Seepage to wells and drains Seepage into excavations Seepage through and below dams Piping, heave and internal erosion Liquefaction Surface water erosion Wave actions
E08	Dynamic Problems	E08 Basic theories Impact problems Machine foundations Earthquake effects Blast effects Wave propagation Dynamic response Wind effects
E09	Frost Action and Heat-transfer Problems	E09 Basic theories Temperature distribution in soil Thermodynamic conditions Heat exchange at ground surface Frost penetration Frost problems related to structures
E10	Analysis of Base Courses and Pavements Behaviour	
E11	Soil-vehicle Interaction (trafficability)	E11 Trafficability Terra mechanics
E12	Soil-Structure Interation	
E13	Computer Analysis	E13 Computer analysis Finite element method

F ROCK PROPERTIES; LABORATORY AND FIELD DETERMINATIONS — Concepts, theories, Methods of Determination, Equipment and Results

Main Divisions		Possible Subdivisions[1]	
F00	General	F00	Laboratory supplies General testing equipment
F01	Classification and Identification	F01	Rock classification Rock identification Rock hardness (drillability) Rock quality (incl.recovery, velocity ratio, fracture frequency) Fissure patterns Joints survey
F02	Physico-chemical Properties	F02	Geochemical properties of rock Weathering resistance
F03	Composition, Structure and Density	F03	Density and porosity Composition Structure Planes of cleavages and beddings Folding Cavities
F04	Permeability and Capillarity	F04	Permeability Capillarity
F05	Compressibility and Swelling	F05	Compressibility Swelling Time effects
F06	Shear-Deformation and Strength Properties	F06	Elastic properties Plastic properties Compression strength Tensile strength Residual strength Joint strength Rheological features
F07	Dynamic Properties	F07	Blasting tests Vibration tests
F08	Special Properties of Rock	F08	Thermal properties Electric properties Magnetic properties

G. ANALYSIS OF ROCK-ENGINEERING PROBLEMS — Theoretical, Empirical and Practical Methods of Analysis

Main Divisions		Possible Subdivisions[1]	
G00	General	G00	Safety factors in general
G01	In Situ Stresses caused by Gravity, Tectonics, Applied Loads and Excavations	G01	Stress release due to excavation Stresses due to swelling clays Anchor stresses Rock burst
G02	Deformation Problems		
G03	Bearing Capacity of Rock		
G04	Stability of Slopes, Excavations and Openings		
G05	Seepage and other Hydrologic Problems		
G06	Dynamic Problems	G06	Basic theories Earthquake effects Wave propagation Dynamic response
G07	Frost Action and Heat-transfer Problems		
G08	Computer Analysis	G08	Computer analysis Finite element method

1. To be further considered

H DESIGN, CONSTRUCTION AND BEHAVIOUR OF ENGINEERING WORKS Descriptions; Case Histories; Syntheses of Investigations, Design, Construction (including equipment and materials) and Behaviour

Main Divisions		Possible Subdivisions	
H00	General	H00	General contracts General specifications Failures in general
H01	Foundations of Structures	H01	Shallow foundations Piled foundations Deep foundations, excluding piles Buildings Bridges Tanks Towers Masts
H02	Retaining Structures, Cut-off Walls and Concrete Dams	H02	Retaining walls Sheet-pile walls Cellular cofferdams Cut-off walls Sheeted excavations Tied-back walls Concrete Dams Reservoirs
H03	Unsupported Excavations	H03	Open cuts Open pits
H04	Earth and Rock Fill Dams and Earth Embankments	H04	Earthworks Embankments Fills and dumps Earth-fill dams Rock-fill dams Tips Tailings
H05	Underground Structures	H05	Tunnels in soil Tunnels in rock Shafts Mines
H06	Base Courses and Pavements of Roads, Railroads and Airfields	H06	Airfields Railroads Roads
H07	Harbours, Canals and Coastal Protective Projects	H07	Harbours Canals Coastal protective projects River regulation projects Docks Dolphins Jetties Groins
H08	Conduits and Culverts	H08	Conduits Culverts Pipelines
H09	Slopes	H09	Slopes
H10	Land Use	H10	Land use Urban and regional planning

K CONSTRUCTION METHODS AND EQUIPMENT

Including improvement of soil and rock conditions

Main Divisions		Possible Subdivisions	
K00	General	K00	Economical aspects
K01	Dewatering and Drainage	K01	Vertical drainage, incl. sand and paper drains Ground water lowering Dewatering by electro-osmosis Deep wells, incl. well points
K02	Sealing and Grouting Processes	K02	Sealing processes Grouting Injection
K03	Preloading and Soil Replacement	K03	Preloading processes Soil replacement by pressing Soil replacement by blasting
K04	Soil and Rock Excavation, Processing and Transportation	K04	Soil excavation Rock excavation Rock blasting and boring methods Tunnelling processes Nuclear explosives Rippability Soil cutting processes Transportation of masses
K05	Compaction Processes	K05	Tamping Rolling Vibration Vibroflotation Falling body Blasting Ponding Densification by piles
K06	Soil Stabilization and Erosion Control	K06	Mechanical stabilization Chemical stabilization (lime, cement etc.) Thermal stabilization Reinforcement of soil Erosion control
K07	Piles and Pile Driving	K07	Pile types Pile driving rigs Pile driving procedures Sheet piling Physiological aspects, e.g. reduction of noise
K08	Foundation of Caissons and Deep Piers	K08	Caissons Deep piers
K09	Construction Methods for Shallow Foundations	K09	Foundation of footings, slabs and mats Under pinning
K10	Slurry-assisted Construction of Foundation and Cut-off Walls	K10	Diaphragm walls Cut-off walls
K11	Supports of Soil and Rock	K11	Anchorages Bracing Linings Reinforcement Shotcrete Concrete support Tied-back walls Tunnel supports
K12	Deep-water Construction Methods and Equipment	K12	Dredging Deep-water construction Barge dumping
K13	Frost Protection Works	K13	Drainage operations Placing of special fill materials Protective plastic boards Exchange of soil materials
K14	Surface Techniques for Improving Deformation and Stability Conditions	K14	Coated (reinforced) fabrics Fascine mats Loading berms Light-weight fills (e.g. expanded clay, bark, saw dust) Timber grillages

M MATERIALS OF CONSTRUCTION

Main Divisions		Possible Subdivisions	
M00	General		
M01	Steel	M01	Steel durability Steel profiles
M02	Wood	M02	Wood as construction material Wood durability
M03	Bituminous Materials	M03	Asphalt Asphaltic concrete Bitumen Filler Mastics
M04	Plastics and Similar Materials	M04	Nylon Resin Plastics
M05	Cement and Chemicals	M05	Cement Lime
M06	Concrete	M06	Air entrainment Concrete Concrete aggregates Concrete durability Concrete testing
M07	Paints and Coatings	M07	Coatings Paints
M08	Construction Elements	M08	Bricks Rockwool

S SNOW AND ICE MECHANICS AND ENGINEERING

Main Divisions		Possible Subdivisions	
S00	General		
S01	Snow and Ice Cover	S01	Snow occurrence and depth Avalanches Glaciers Ice cover on water bodies
S02	Properties of Snow and Ice	S02	Physical Properties of snow Physical properties of ice Thermodynamics of ice-water systems
S03	Snow and Ice Engineering	S03	Snow and ice as structural materials Snow and ice removal Protection methods and structures against snow and ice

T RELATED DISCIPLINES

Main Divisions		Possible Subdivisions[1]	
T00	General	T00	Research and development Economical aspects
T01	Pure Sciences	T01	Chemistry Mathematics Physics, incl. rheology in general Computer science Finite element method in general
T02	Geosciences	T02	Geochemistry Geology, incl. soil science Geophysics Geography Hydrology Seismology
T03	Agriculture and Pedology		
T04	Meterology and Climatology		
T05	Biosciences	T05	Botany Zoology

T06	Civil Engineering	T06 Building industry Coastal engineering Concrete technology Construction Geodesy, incl. surveying and mapping Highway and railway engineering Hydraulic engineering Irrigation and drainage engineering Pipelines Power engineering Sanitary engineering Structural engineering Town and regional planning Transport engineering Waterways and harbours
T07	Mining Engineering and Ore Prospecting	
T08	Mechanical Engineering	
T09	Electrical Engineering	
T10	Ocean Engineering	
T11	Military and Naval Engineering	
T12	Instrumentation and Measuring Technique	
T13	Library Science	T13 Documentation Retrieval techniques
T14	Environmental Problems and Nature Conservation	
T15	Oil Prospecting	

1. To be further considered

OPENING SESSION
SEANCE INAGURALE
ЗАСЕДАНИЕ, ПОСВЯЩЕННОЕ ОТКРЫТИЮ КОНГРЕССА

CENTRAL STATE CONCERT HALL, AUGUST,6, 1973

Participants

Prof.Ralph B.Peck, President of the International Society for Soil Mechanics and Foundations Engineering.

Prof. I.A.Ganichev, President of the Organizing Committee, Vice-Chairman of the State Building Committee of the USSR

I.T.Novikov, Chairman of the State Building Committee of the USSR

V.F.Promyslov, Chairman of the Executive Committee of the Moscow Soviet

Acad. A.P.Vinogradov, Vice-President of the Academy of Sciences of the USSR

Prof.N.A.Tsytovich, President of the USSR National Committee for Soil Mechanics and Foundations Engineering, Vice-Chairman of the Organizing Committee, Corresponding Member of the Academy of Sciences of the USSR

N.S.Chetyrkin, Secretary General of Organizing Committee

Prof. Ralph B.Peck.

Welcome to the VIII International Conference on Soil Mechanics and Foundation Engineering, a conference that opens the thirty-seventh year of our International Society.

At the VI Conference in Montreal we noted with sadness the death of Karl Terzaghi, after over eighty years of fruitful living, the founder of soil mechanics, the first president of our International Society, and its honorary president at the time of his death; he could truly be said to have finished his work. Today we must mark the passing, much before his time, of our most recent past president, a young man at the prime of his career. I need not recount the professional accomplishments of Laurits Bjerrum; they are well known to all of us. I would rather remember on this occasion his leadership, his dynamic personality, his enthusiasm, and his friendship.

He took pride in being an engineer and indeed he was among the best, with a keen sense of proportion, judgment, practicality, and economics. Yet, he was enormously curious about fundamentals and pursued the science of soil mechanics with remarkable success. He saw, perhaps more clearly than anyone other than Terzaghi himself, the interrelationships between art and science, theory and practice, field observations and laboratory studies. He was indeed a complete engineer as he was a whole man. He was also an outstanding educator, for he made his Institute truly the finishing school of soil mechanics where many of our ablest young people were exposed to his outlook and his zeal.

We shall miss him greatly, for he was unique and no one can replace him. May I ask that you all rise with me in a moment of silence in his memory.

. . . . . .

Laurits Bjerrum would not have wished us to let our sorrow at his passing influence in any way our deliberations here. We shall honor him by submitting his contributions to the same scrutiny they would have received had he been present. We shall honor him by advancing soil mechanics and foundation engineering in this conference as he would have wished.

We look forward to sharing our experiences in the coming week, to becoming personally acquainted with the developments and accomplishments of soil mechanics in the vast territory of our host country, and to making or renewing the friendships that have so happily characterized our profession and our International Society.

Prof. I.A.Ganichev

Ladies and Gentlemen, Comrades and Friends!

On behalf of the Organizing Committee allow me to open the VIII International Conference on Soil Mechanics and Foundation Engineering.

According to preliminary data,delegates from 51 countries are attending this Conference. The Organizing Committee has registered 1653 participants and 520 guests.

Thus, it is evident that the VIII Conference will be the most representative forum of specialists and scientists ever held in the field of soil mechanics and foundation engineering.

The Proceedings of this Conference constitute 210 scientific papers and 150 short scientific reports which contain valuable theoretical investigations and generalized experience from many countries.

On behalf of the Organizing Committee I want to express our sincerest gratitude to the officers of the International Society for Soil Mechanics and Foundation Engineering,

activities of Soviet scientists are the concentration of their efforts in solving the most urgent problems the consolidation of ties between science and practice and comprehensive application of scientific achievements in the national economy.

Attaching great importance to international cooperation in science and engineering, the Soviet government is sure that the work of the VIII International Conference on Soil Mechanics and Foundation Engineering will further extend knowledge in this important branch of the engineering sciences, and broaden the relations and cooperation between the scientists and specialists of all contries.

We wish the participants and guests of the VIII International Conference on Soil Mechanics and Foundation Engineering success in their work and great scientific achievements for the welfare of mankind.

The USSR Council of Ministers

V.F.Promyslov.

Ladies and Gentlemen, Friends and Comrades!

On behalf of the Executive Committee of the Moscow Soviet of Working People's Deputies and all Moscovites allow me to extend our most cordial greetings to the delegates and guests of the VIII International Conference on Soil Mechanics and Foundation Engineering.

Soil Mechanics and Foundation Engineering, as a branch of modern science, is called upon to provide the most precise engineering solutions, and at the same time the most economical ones, in the design and construction of up-to-date industrial projects, residential houses, hydrotechnical and other structures.

We are very glad that Moscow has been chosen as the host-city for this international Conference.

In Moscow, the capital of our state, as well as all over our country, vast construction of residential, civil and industrial projects is being carried out in realization of the XXIV Communist Party Congress resolutions, namely, to improve the working and living conditions of Soviet citizens.

For these reasons, the recommendations adopted by this Conference, as a result of the exchange of experience in the theory and practice in foundation engineering, will be of great interest to specialists in civil engineering in Moscow as well as to all Soviet specialists in this field.

I want to take this opportunity to invite the participants and guests of this Conference to become acquainted in their free time with the capital of our Country and with the life of its citizens.

Moscow, you will find, is a treasure-house of items of art and culture which the Moscovites will be happy to show you. They will be happy to extend traditional Russian hospitality to you.

Permit me to wish the participants and guests of the VIII International Conference on Soil Mechanics and Foundation Engineering success in their work and further scientific achievements in the name of peace and friendship for all the peoples of the world.

Acad.A.P.Vinogradov

Ladies and Gentlemen, comrades!

I have a great pleasure to greeting the participants of the VIII International Conference on Soil Mechanics and Foundation Engineeon behalf of the USSR Academy of Sciences. At our time science and its place in life of society have grown ever so much. Science became one of the greatest motive power of mankind in its progress as a cohole. Science became an International one, the countries of all over the world have an urge to develop scientific researches, spend large sums of money on science. Man has get into cosmos, has made the first steps on the Moon. And still all of us live on the Earth and love number of unsolved secrets.

Your Conference is devoted to consolidation of efforts of specialists all over the world to research our. Earth. I wish the Conference every success in its work.

Prof.N.A.Tsytovich

Mr.President, Ladies and Gentlemen, Comrades!

On behalf of the USSR National Society for Soil Mechanics and Foundation Engineering allow me to extend our most cordial greetings to the delegates and guests of the VIII International Conference attended by more than 1000 members of National Societies from 50 countries, as well as by many guests.

The USSR National Society considers it a great honour to be the host to so many eminent specialists and to discuss problems in soil mechanics and foundation engineering with them.

We are very much obliged to the officers of the International Society for Soil Mechanics and Foundation Engineering for their valuable advice on the organization of the VIII Conference and to our esteemed colleagues, who have consented to act as chairmen of the Main and Specialty Sessions, and especially, to the General Reporters, whose task is to review and generalize the achievements of the problems under consideration during the period that has elapsed after the last International Conference. We are sure that the participants of the VIII Conference who will take part in the discussions on the announced topics, will make concrete proposals on the "Conclusions, recommendations and topics for discussion", stated by the General Reporters.

The development of our branch of science, namely, soil mechanics and foundation engineering, is engendered by life itself: by the insistent requirements of up-to-date complex building techniques. It is also necessary to recall that the founders of soil mechanics, Professor C.Coulomb (France), Professor Karl Terzaghi (USA), Professors V.N.Kurdyumov, N.M.Gersevanov (USSR) and others, always made their aim the development of science as an aid to building practice.

Undoubtedly, a number of papers submitted to the VIII Conference will be highly valuable for furthering the development of theory and a great aid in building practice.

and firstly-to its President, Professor Ralph B.Peck; the Secretary General, Professor J.K.T.L.Nash and the Vice-President for Europe, Professor E.de Beer for their very valuable recommendations on the preparation of the VIII Conference.

We are also very much obliged to those distinguished scientists, who so kindly prepared and will read the General Reports at the Main Sessions of this Conference, and to all the scientists and specialists, who presented their papers and reports.

The Organizing Committee is making every effort to maintain the work of this Conference on a high theoretical level, to acquaint its participants and guests with our experience in the field of soil mechanics and foundation engineering, and with the historical monuments of our people, our culture and art.

Permit me to express my confidence that all the specialists present in this hall will be successful in the work we are beginning and will, here at this Conference, lay a sound foundation for our further cooperation and friendship.

Welcome to Moscow!
I wish you every success!

I.T.Novikov

Ladies and Gentlemen, Comrades and Friends!

I have the honour of greeting the participants and guests of the VIII International Conference on Soil Mechanics and Foundation Engineering on behalf of the Soviet Government.

Soil mechanics and foundation engineering is an important branch of engineering science and is faced by the complex and critical problems of perfecting research techniques for soils, and of the design and construction of economical bases and foundations for up-to-date industrial projects, residential and public buildings, power, transport and other structures.

Personal contacts between scientists and specialists in such a broad and representative forum, the exchange of experience, new ideas and results of theoretical investigations will undoubtedly facilitate the extension of this branch of science, make its role more important in building practice, and consolidate relations and cooperation between scientists and specialists from many countries.

Your visit to our country coincides with positive changes in the international situation. The period of "cold war" is passing away. The principles of peaceful co-existance between countries with various social systems are being more widely recognized. Mutually beneficial relations in economy, science and engineering are broadening.

The improvement in international relations is a triumph of the peace forces and it brings joy to all honest people the world over.

The summit talks of L.I.Brezhnev, the Secretary General of the Central Committee of of the Communist Party of the USSR, in the Federal Republic of Germany, the United States of America and in France, and the agreements reached there are warmly approved by the Soviet people and progressive people all over the world.

The Soviet Government does all in its power to take new constructive steps in strengthening world peace and international security.

The development of science and engineering by the joint efforts of scientists and specialists from various countries for the employment of these achievements for the welfare of mankind is becoming a vital factor of international life. The VIII International Conference on Soil Mechanics and Foundation Engineering will undoubtedly facilitate this noble cause.

The Organizing Committee has arranged visits for the participants and guests of this Conference to building sites, research and designing institutions, and also to museums and theatres. This will enable you not only to participate in the work of the Conference but also to get aquainted with the historical monuments and sights of Moscow and other cities, with the creative arts of our people engaged in working for the welfare of our country and in the name of peace the world over.

We wish you fruitful work at this Conference and a pleasant stay in our country.

Permit me to read the greeting of the USSR Council of Minsters.

To the Participants of the VIII International Conference on Soil Mechanics and Foundation Engineering

The USSR Council of Ministers expresses its warmest greetings to the participants and guests of the VIII International Conference on Soil Mechanics and Foundation Engineering.

In the last few years, due to the efforts of scientists and specialists from various countries, much has been done to utilize up-to-date achievements in science and engineering for the investigation of geological-engineering conditions in construction on various soils, for working out new theoretical principles on the design of bases and foundations, and for the introduction of economic methods of investigating engineering properties of soils.

Under the present conditions when, due to the efforts of the progressive peace forces, international tensions are decreasing, the role and importance of wide and fruitful cooperation of scientists and specialists from various countries increases in bringing together the peoples and in the development of science and engineering in all branches of industry. The government of the USSR does everything within its power to provide for peace and mutually beneficial relations between all peoples.

In our country, where science enjoys every possible support of the government, much attention is paid to the development of theoretical research. The main factors in the

The USSR National Society is making every effort to facilitate the work of the VIII International Conference,so that the participants can make use of the results of its work, and can also become acquainted during the Conference and on the post-Conference tours with certain unique buildings and constructions of our Socialist State,with our scientific schools in soil mechanics and can visit artistic and architectural monuments of our multi-national country.

We wish the VIII Conference every success in its work.

Welcome to the VIII Conference! Thank you.

Prof.Ralph B.Peck,President of the International Society for Soil Mechanics and Foundation Engineering

Opening Address

Two hundred years have now passed since Coulomb began what we now regard as classical soil mechanics, fifty years since Terzaghi's first publication which initiated modern soil mechanics. The great canals of France and England were constructed from two hundred to three hundred years ago. It has been almost forty years since completion of the San Francisco-Oakland Bay crossing, for which the Yerba Buena tunnel was successfully driven with a diameter of 60 feet through soft ground, and the deep center pier for the suspension bridge was established by means of Moran's domed caissons. These spectacular but now venerable accomplishments justify our asking what progress we have made since those days, whether we have advanced as far as we should, and where our profession may be moving.

During the last four years I have visited many of our members in many countries and have participated in or become acquainted with their efforts in research, in teaching, and in practice. I can testify that soil mechanics,basic and applied, is still vigorous, still healthy,and still progressing. Yet, some of our efforts are less productive than others. I have come to a few conclusions concerning the state of soil mechanics and its applications that I wish to share with you in the hope that they may influence our progress in the next few years.

The most fruitful research grows out of practical problems. This conclusion is by no means new. It was emphasized by Terzaghi in his first Presidential Address in 1936. It bears repitition because there seems always to be a tendency to justify trivial research on the grounds that,although it has no use today, it may someday turn out to be important.

Professors and their proteges,are often the worst offenders in devotion to research of minor consequence because the academic climate encourages finding a subject for investigation that can be pursued at the desk or in the laboratory until all aspects have been exhausted. The subject is likely to be chosen more for convenience than for significance. Consider, for example, the remarkable number of papers dealing with the ultimate bearing capacity of shallow footings on sands in terms of the angle of internal friction. Although a few workers have recognized the crucial role that the compressibility of the sands plays in the ultimate bearing capacity, dozens of papers appear each year in which the only soil property is the friction angle. The results of different workers differ appreciably and it must be admitted that the problem has not yet been completely solves. Nevertheless, the definitive solution would be of slight import because the bearing capacity of a footing on sand is of little practical significance; the pressure on such a footing is almost always limited by the allowable settlement.The real motivation for continuing to work on this problem without regard to compressibility as well as friction must surely be fascination with mathematical or laboratory manipulation or compulsion to publish with predictable regularity.

Certain individuals including professors, have, of course, made outstandingly significant contributions to soil mechanics, both pure and applied. What has distringuished such people is the relevance of the questions they have asked, as well as the skill with which they have sought the answers. Skempton's direction of research at imperial College for example, never allowed the pursuit of knowledge of shear strength to stray from the reality of observed bearing-capacity failures and observed slope failures. Questions from the field prompted theoretical and laboratory studies; questions from theory and laboratory prompted searches for new field evidence. Many individuals studied some aspects of the work in detail, often in a fundamental way, but every individual's study fitted into the broad purpose of the group, and the broad purpose was to elucidate practical problems.

Few would disagree that organizations such as the Norwegian Geotechnical Institute under the leadership of our late President Laurits Bjerrum have been among the most fruitful in developing both the science and the art of our profession. Every institution of this kind has been created to solve practical problems peculiar to it own country or region; every successful such institution has contributed heavily and necessarily to fundamental knowledge while accomplishing its official mission.

In some quarters here is a feeling that the needs of practitioners are less deserving of attention than what might be classified as pure science. I see no reason to be ashamed of attempting to solve problems of importance to practitioners and I am convinced that the serious investigation of questions arising out of these problems will continue to prompt fundamental studies of major consequence. Translating the findings of research into simple concepts and procedures for the guidance of the general practicing engineer, moreover,is a duty and a worthy activity of our profession.

Geology should be used to greater advantage. We deal with geological materials, yet geological techniques, geological reasoning, and the implications of geology are rarely utilized to maximum advantage.

Too often we take recourse in statistical methods for determining the average or most probable characteristic of a natural deposit and, in some instances, the likely deviations from the average. The statistical methods are sometimes remarkably refined. Yet, they are frequently entirely inappropriate because randomness is assumed to be a characteristic of the deposits. Nature, however, did not create deposits by random processes but in accordance with strict physical laws such as those of hydraulics and sediment transport. Alluvial deposits, for example, are likely to consists of a multiplicity of lenses, each of which might be called a sedimentation unit, each laid down under remarkably uniform conditions, but each differing from its neighbors. Had we been able to watch the deposition of these lenses and their subsequent erosion and replacement in the building up of the deposit, we would not have considered the process to be random. Our difficulty is that we were not witnesses to the deposition, and we did not see the specific physical causes of the changes from lens to lens. Somilarly, we often consider the properties of residual clay to be random whereas, in reality, they are a direct consequence of the orientation and spacing of the various sets of joints that made up the original rock. Many a deposit considered to be of unpredictable variability and depth has turned out to be exactly what should have been expected on the basis of the patterns of jointing, shearing, folding, and faulting that could be worked out by geological methods.

Indeed, geological knowledge of the existence of sedimentation units in alluvial deposits should long ago have led us to the conclusion that numerical values of the relative density of such deposits, even though determined by conscientious sampling and testing, may often be completely meaningless. Each sedimentation unit has a characteristic rather uniform grain size. The material in such a unit also has a definite in-situ void ratio and has definite values of void ratio in the loosest and densest states. Hence, values of relative density are meaningful for such a unit. But if a sample obtained in a boring consists of a mixture of even two such units of different characteristic grain size, the void ratio of the mixture in its loosest or in its densest state has no relation to that of each of the lenses separately, and numerical values of relative density based on these loosest or densest states may be completely misleading. Since the lenses or sedimentation units are often small, samples centaining such mixtures are the rule rather than the exception. Thus, the corresponding relative densities are also meaningless. In spite of this shortcoming, many of our conclusions concerning the suitability of a natural alluvial deposit are still based on relative density, an index property that we shoul view with suspicion because of the geological implications.

The influence of overconsolidation on the compressibility of clay strata is widely appreciated. Legitimate uses of statistics include inferences concerning the existence or degree of overconsolidation from such statistical relationships as those between the compression index and the liquid limit, between the c/p ratio and the plasticity index, and between the natural water content and the Atterberg limits. Such relationships, together with the best possible knowledge of the geological history concerning previous overburdens, cycles of desiccation, cementation, or weathering should be used far more than they are in evaluating the compressibility of deposits and in judging the applicability of consolidation tests on samples subject, as all samples are, to disturbance.

Geology enables us to establish what constraints may exist on the shape and depth of the surface of sliding when we consider the stability of natural slopes. It also may throw much light on whether the shearing resistance of the soil should be taken at its peak or, at the other extreme, at its residual value. It has, for example, become apparent that, by causing a reduction in lateral pressure behind the valley walls, the cutting by a river of a valley in flat-lying sedimentary layers of materials of different stiffnesses is inevitably associated with displacements toward the valley. These displacements are likely to be associated with large enough slips in the softer materials adjacent to the stiffer ones to reduce the strengths along horizontal surfaces to residual values. Whereas in the past it has been considered surprising that failures have occurred under these circumstances at friction values as low as residual values, geology tells us that it would be far more logical to assume the strengths to be at residual values unless it can be shown positively that slips have not occurred. A striking body of information accumulated in recent years testifies to this conclusion and points to the overwhelming dependence of the shear strength on the geological processes that have taken place. It might prpperly be said, however, that eingeering geology rather than classical geology led to the conclusion, because the required knowledge consists not only of geological processes but of the stress-deformation-strength behavior of materials; that is, of a knowledge of mechanics.

Our practice falls short of our knowledge. I am persuaded that many more failures of foundations or earth structures occur because a potential problem has been overlooked than because the problem has been recognized but incorrectly or imprecisely solved. We still see bridge abutments creeping toward each other, sliding inward, or tilting backward under the influence of the approach fills although the danger of such movements can be judged by the very simplest of bearing capacity calculations. We still see the failure of foundation piles or excessive settlements of pile-supported structures because the

existence of negative skin friction has been overlooked, although the phenomenon is described and rough methods of calculation are contained in every textbook on soil mechanics. We still commonly design the linings of tunnels and other buried structures as if the earth had no function except to exert a fixed system of loads on the structure, whereas we know that the strength of the surrounding soil and the interaction between structure and soil greatly redistribute the loads, usually in a most favorable manner. We still see vertical or battered piles being relied upon to resist mass movements of the soil in which they are embedded, whereas in reality such members can be effective in carrying lateral loads only if the surrounding soil is stable. In short, failures of these types occur not because we do not understand the technical problems but because we overlook them.

Why should there bu such a discrepancy between our knowledge and our general practice? To some extent, I fear, because of too much specialization and too little appreciation of the interrelation of various branches of civil engineering. Specialists in soil mechanics argue that only they are capable of solving foundation problems; they discourage general civil engineers or structural engineers from entering their domain. I do not share this view. I believe that the education of a civil engineer can and should permit him to carry out intelligently the investigation and design of perhaps 90 per cent of the foundations with which he may be associated, and that his education should permit him to recognize that he needs help in the other 10 per cent. Nevertheless, if the foundation design is assigned to a specialist, there should at all stages be the closest cooperation between the specialists and the other technical people on the project. Otherwise, the foundation engineer may make his recommendations without knowledge of the function of the structure, or the structural engineer may fail to realize the significance of some aspects of his design with respect to its demands on the subsurface materials.

Simple calculations based on a range of variables are better than elaborate ones based on limited input. The development of procedures for calculation such as the finite element method, largely made practicable by electronic computers, has provided us with the means for solving many theoretical problems that could formerly be approached only by crude approximations. These new developments can be of enormous advantage if properly used, but they can furnish misleading results if the emphasis is placed on the techniques of the calculations instead of on their physical significance. All too often those skilled in such techniques are unskilled in selecting the appropriate physical properties for inclusion in the analysis or in appreciating the physical constraints on the problem.

The best use for modern techniques of calculation is to carry out parametric studies to ascertain the influence of variations in soil properties or in geometry. It is sometimes found that a variable difficult to evaluate has a pronounced influence, good engineering may require a design that will be satisfactory for a substantial range in the variable. For example, the bending moments in the lining of a tunnel in stiff clay are, at least theoretically, strongly dependent on the value of K_0, a coefficient not easily determined. An elaborate and costly investigation to attempt to ascertain a single value of K_0 for a particular tunnel would usually be unwarranted. The value may actually vary along the tunnel, and its influence will probably be altered by the construction procedure. Hence, it would be far better engineering to design the tunnel for a range of K_0-values centered about one that may be approximated by means of a simple investigation or on the basis of geological considerations.

In most problems the most important step in design is the visualization of possible or probable modes of failure or deformation. Simple calculations based on a sound conception of these modes are far more meaningful than elaborate calculations which ingore or which too readily overlook controlling factors.

Construction deserves more attention in design. Our permanent structures are too often designed as if they come into existence without the necessity for being constructed. Most of our procedures for designing tunnels, for example, take no account of the deformations of the surrounding soil that inevitably occur before the designed lining can possibly be erected or carry load. Indeed, when primary and secondary linings are used, the secondary lining is usually designed as if the primary lining carried no stress whereas the primary lining may often forever be the principal load-carrying component of the combined linings.

Construction deformations are not always ignored, but their implications may be misjudged. Estimates of the settlement of a structure adjacent to a braced excavation may lead us to the conclusion that the structure will be damaged. Accordingly, we may decide to underpin the structure. If we forget that underpinning is itself accompanied by settlement, and that the differential settlement from column to column associated with underpinning is likely to be more erratic than that associated with the systematic excavation of a braced cut, we may make a considerable expenditure for underpinning but the structure still may crack.

Instrumentation is no substitute for adequate design. A few decades ago field observations were considered to be a luxury by many engineers and by many owners as well. They were usually carried out on government projects or, occasionally, by owners who believed that the information would prove useful on projects built subsequently either for themselves or for others. Today, fortunately, good field observations are much more widespread. Paradoxically, there is danger that field observations are becoming

something of a fad and are being carried to excess. This may seem a strange conclusion for one who has spent much of his professional career encouraging, carrying out, and interpreting field observations.

What is often forgotten is that the observational method is an adjunct to design, not a substitute for it. The observations should be made to answer specific questions, and when the answer has been determined the designer must be able to put into effect a previously prepared course of action. If he has no such course of action already in mind, he is not using the observational method, but is engaging wishful thinking that the observations will disclose favorable conditions. If they disclose the opposite and the designer has no alternative, he has failed in his function.

Intelligent observation is always an asset on a construction job, but intelligent observation does not always require instrumentation. Moreover, instrumentation, if required does not always need to be elaborate. Indeed, in may judgment, the simplest measurements are always the best because they have the least possibility for error and the greatest likelihood of survival. Where there is a choice, mechanical instruments are to be preferred over electrical ones, and simple electrical instruments over complex ones. Where the quantity to be measured does require complex instrumentation, the installation deserves careful planning, execution and maintenance by experienced persons who are fully aware of the difficulties of obtaining reliable results.

We should write with more discrimination. Soil mechanics and foundation engineering has an active literature, as it should. We are fortunate, thanks to the efforts of several of our most dedicated members, to have an excellent abstract and retrieval system, admirably suit to our needs and second to that of no other profession.

Unhappily, far too much that we write is not worth reading. The prestige presumed to be associated with authorship results in great pressure to publish. Discussions are considered less prestigious than papers. Hence, instead of preparing a careful and critical discussion, containing data that might alter or disprove the conclusions of a paper, the potential discussor often prefers to add to the literature his own independent paper which in turn may receive little critical discussion. Yet, many an unwary reader believes that what appears in print must be correct. We would do well to lend our weight to any effort that would reduce the artificial pressures to publish for reasons of prestige, promotion, or the advancement of the author or his institution. Self-discipline by prospective authors, and publication procedures that encourage open discussion, would be of great benefit to our literature.

Rarely does one find complete descriptions of the conception, design, construction, and behaviour of geotechnical projects, together with the opportunity for discussion and exchange of opinion. A shining exception is afforded by the Institution of Civil Engineers, in which this one widespread method of disseminating and evaluating information about engineering projects is still practiced.

For many years there was little opportunity to present short notes about theory, laboratory tests, or practice although such notes often contribute valuable information. I am pleased to see that sections for such brief contributions have been added in several publications. It would be useful to have even more opportunities for presentations of this kind in widely circulated journals.

Our profession has a challenging future. Although I have highlighted some of our shortcomings, I have done so not from the point of view of a destructive critic, but because the correction of some of our defects and the improvement of some of our trends can enhance the future of our profession. Workers in our field will continue to be challenged by the unique synthesis of two different disciplines. On the one hand our works and our progress are governed by the laws of mechanics and hydraulics. We can never depart successfully from analytical procedures leading to quantitative conclusions concerning deformations or degrees of safety. On the other hand, every earth structure is constructed in or of a geological medium. We can never successfully divorce our thinking from the overwhelming influence of geology on our works. As we learn better how to accommodate ourselves to the demands of these two disciplines, we shall be able to carry out heretofore impossible tasks, and we shall be able to carry out with greater efficiency and skill the simpler tasks that will confront us. Because nature is infinitely variable, the geological aspects of our profession assure us that there will never be two jobs exactly alike. Hence, we need never fear that our profession will become routine and dull. If it should, we can rest assured that we would not be practicing it properly.

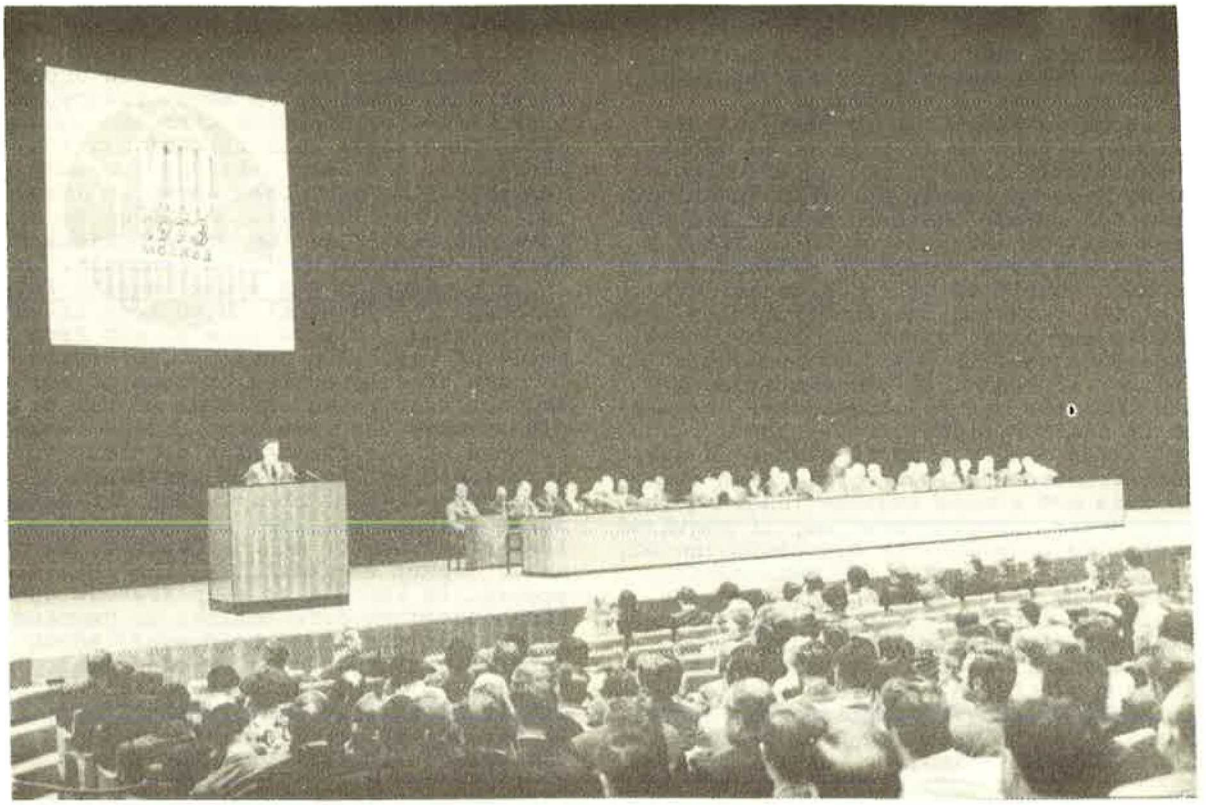

Fig.1. Opening Ceremony of the VIII International Conference for Soil Mechanics and Foundation Engineering, August, 6, 1973. Address on the behalf of the USSR Government by I.T. Novikov, Vice-Chairman of the Council of Ministers of the USSR, Chairman of GOSSTROY USSR

Fig.2. Closing Session of the Conference August 11, 1973, Presidium

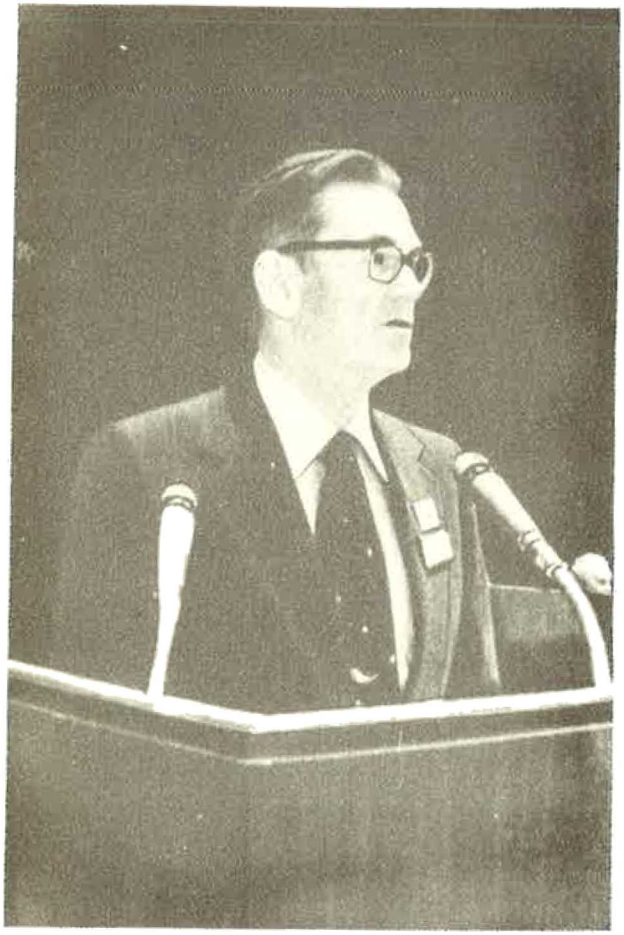

Fig.3. Opening address by Prof.Ralph B.Peck Past-President of ISSMFE

Fig.4. Special lecture "The Bicentennial of C.Coulomb's Theory of Loose Media" by Prof. J.Kerisel (France), the president of ISSMFE, August 7, 1973

ACHIEVEMENTS IN THE FIELD OF SOIL MECHANICS AND FOUNDATION CONSTRUCTION IN THE USSR

Ganichev I.A. /USSR/

One of the fundamental tasks of the VIII International Congress on Soil Mechanics and Foundation Construction is a comprehensive exchange of the experience gained by scientists and experts in different countries in this field.

The aim of the present report is to aquaint the Congress participants with the experience of the Soviet School in the field of soils mechanics and foundation construction on all stages of its development and in various branches of construction.

The work by Soviet scientists and engineers in the field of soil mechanics and foundation construction have created the possibility for numerous civil, industrial and hydrotechnical structures to be constructed in the USSR under various engineering and geological and climatic conditions.

The Soviet Union occupies the territory of more than 22 million sq.km. Stetching from the latitude 77° to 35° North. The climate in this country varies from a cold arctic one with the temperature down to -70° to subtropical and desert climatic conditions in the South where in summer it exceeds 30°C. In west to east direction it changes from sharp continental till monsoon.

In some areas average rainfall per year constitutes 2500mm and in a desert Zone it does not exceed 100mm per year.

The engineering and geological conditions in the USSR are highly varied. On vast territories there are highly compressible clayey and structurally unstable soils. Up to 48 per cent of the territory is covered by ever frozen soils with a layer depth reaching 500 m in northern areas while the value of a season thawing layer amounts from 1m to 3m. In the Ukraine, the Siberia and the Middle Asia loess soils are widely spread with a 10-30m layer depth; the subsidence of these soils under their own weights when being watered reaches 150-250cm. In the regions of the Volga and the Northern Caucasus there are soils swelling under moistening. In the Middle Asia there are saline soils. With prolonged water effects under the influence of leaching processes foundations on such soils give additional settlement. In the North of this country, in the Siberia in the conditions of a high ground water table there are widely spread peaty territories and soils with considerable contents of vegetation remains, there age some territories formated by river and marine silts. The depths of these soil layers are from 10 m to 20m. Less compressible soils are deposited lower and bedrooks occur only at the depth of more than 50-100m. A part of the Soviet Union territory is subject to seismic effects their intensity being up to 10-11 points according to the MSK-64 scale.

Construction conditions, the short characteristics of which is cited, have determined the range of problems being solved by Soviet specialists to achieve a wide program of further industrialization in this country and the construction of dwelling and civil buildings.

The volumes of capital investments in the USSR can be characterized by the following data. The capital investments in the national economy over the five-year period from 1971 to 1975 will amount to approximately 500 billion rubles, including about 30 billion rubles planned to be spent on the construction of foundations for buildings and structures. During the past two years of the five-year period (1971-1972) a vast building program was already carried out. The volume of the capital investments over these two years exceeded 180 billion rubles. The production potential of the national economy is steadily growing and improving, hundreds of new large industrial enterprises and projects are put into operation. There were completely constructed and commissioned the Krasnoyarsk hydroelectric station with a 6 million kilowatt capacity, the Volzhsk autobobile plant with a capacity of 660 thous. cars per year, the Kirish Oil processing plant, the chemical plant in Navoi, the car-building plant in Kadiev, etc. Many existing plants have been reconstructed and expanded. These data show what great significance has the development of new solutions of foundations their further industrialization with simultaneous provision of safety.

The Soviet science has been making an invaluable contribution successfully solving important problems and enriching the practice of building production. In the field of construction, the industry of building materials, construction and road construction mechanical engineering there are 190 research organizations and high schools with 32.3 thous. research workers, including 486 Doctors of Sciences and 7599 Candidates of Sciences. Soviet scientists, working in the field of town planning, have created a theory of planning and development of pupulated areas, which is based on a long-termed planned development of the national economy taken as the main design town planning factor. Scientific fundamentals of typification of industrial, dwelling and public buildings were developed and introduced into construction practice, which allowed wide scale industrialization of construction. At present about 91 per cent of the total volume of housing is carried out on the bases of type designs. The successful development of buildings typification is attributed to the methods worked out by Soviet scientists for unification of volume and planning, spatial and structural parametres of buildings and structures, erected in complex natural conditions. The outstanding achievements by Soviet scientists are research works in the field of a structure theory and development of new building structures, including a limit design method for structures and foundations, design methods for complex spatial systems and metal structures for fatigue strength and brittle failure.

Soil mechanics being a scientific basis for design and construction of foundations, occupies significant place in the investigations carried out by Soviet scientists.

The role of soil mechanics for construction was realized in Russia as earlier as the end of the XVIII century. Almost simultaneously in France and in Russia two most important principles of soil mechanics were found out: linear relationship of limit tangential stress upon the area of sliding (Charle Coulone,1773,France)-for determination of soil strength, and linear relationship between the settlement of soil foundation and the pressure against its surface (Nikolay Fuss, 1798, Russia)- for design of settlement.

In the middle of the XIX century these concepts were taken as the bases for the development of a theory of soil pressure against retaining walls,a theory of foundation strength and a theory of interaction between a slender beam and a compressible foundations.

Russian scientists and engineers carried out comprehensive investigations into determining the mechanical characteristics of soil foundations and developing rational types of foundations. The first course on foundations was published in Russia in 1869 before similar courses having been published abroad. Beginning from 1914 Russian scientists use a slenderness theory to determine stresses and deformations in soil foundations. In the XX-th century soil mechanics has reached maturity which allows it to occupy a worthy place in general mechanics along with hydrodynamics, aerodynamics and exerted a substancial influence on the progress in foundation construction.

As was already noted, on the territory of the USSR the deposits of loose rocks (soils), forming highly compressible considerable strata, are spread almost everywhere and very often builders had and have to erect capital structures (civil,industrial,hydrotechnical,etc) on compressible foundations. Therefore,Soviet scientists and engineers always attached great importance to the study of the characteristics of compressible foundations and the development of soil mechanics as a theory of natural foundations. Severe climatic conditions and great volumes of construction predetermined the direction of the investigations in the field of soil mechanics and foundation construction,resulting in the possibility of constructing foundations throughout the year and not only in a summer period. As a result of these studies, a wide use was also made of precast foundations in open excavations as well as of precast pile foundations and raft foundations. These two trends in the development of theory and practice in foundation construction-the erection of buildings and structures on compressible foundations and prefabrication of foundations- determine the directions of Soviet scientists' and engineers' work.

Research work, conducted by Soviet specialists in the field of soil mechanics,features its connection with construction practice. Already in1928 in the USSR there was set up a scientific organization headed by the founder of the Soviet school of soil mechanics Prof.Gersevanov,Associate Member of the USSR Academy of Sciences(now it is the Institute of Scientific Research on Foundations and Underground Structures decorated with an Order of the Red Banner of Labour,the Gosstroy of the USSR). A close contact with large building organizations and carrying out of research experimental work directly on construction sites with complete material assistance of the latter, allowed to realize practical suggestions resulting from theoretical generalizations already over the first years.

Field experiments conducted on construction sites,made it possible to find out the relationship between foundation settlements and sizes and areas of a foundation base. The areas of experimental foundation basis amounted to 25 sq.m. The test were carried out on loams and sands with appropriate repetition. By tests it was found out that a considerable field of foundation deformation located below the plane of the ends of a pile group which allowed subsequently to develop the design rules for the settlement of pile foundations. Large-scale field tests allowed to determine the regularity of subsidence phenomena with moustening loess soils. On Siberian construction sites tests, conducted in field conditions, revealed the regularity of the deformations of ever-frozen soils in foundation bases. At the construction of a series of multistory buildings in Moscow the problems of the regularity of interaction between deformable foundation and a building structure were studied. Most extensive investigations into the strength and stability of soil masses were achieved on the construction of hydrotechnical projects. Similar research studies the description of which requires much more time than it is given for the present report, were carried out on many other construction sites.

As is known, construction starts with design which is the initial but to a considerable extent a decisive stage in construction. The development of a design concludes scientific research and predetermines the introduction of latest achievements of science into production. At present in the USSR more than 600 thous.designers and draughtsmen and a thousand and a half of design and prospecting organizations are occupied in this important work. A feature of modern design and construction in the USSR is a state system of standardized design methods and methods of work fulfilment. Soviet scientists and engineers have developed Building Codes of Practice and Rules (SNiP) which are in compulsory use from 1954 for all Ministries and Departments. There were also developed State standards (GOST) on methods for testing materials and structures,the process of their production, etc. Building Codes of Practice and standards are constantly revised and perfected. They contribute to the introduction of science achievements into the practice of construction.

The problems of foundation construction are also specified in Building Codes of Practice and standards, including methods of engineering and geological prospecting work and evaluation of soil characteristics, design methods and methods of work fulfilment as well as service rules for buildings and

structures being built with due consideration of the behaviour of a soil foundation.

The most substantial achievement of the home soil mechanics is the transfer from a design of structure foundations over allowable pressures on soil to a limit design. The construction practice has convincingly shown that losses of bearing capacity in the form of foundation failure under existing buildings and structures transferring mainly a vertical load onto soil, practically do not occur. The immediate danger presents considerable settlements of structures and, particular, uneven ones. And the values of pressure transferred onto the soil are varied for different structures. The principle of foundation limit design issuing from objective characteristics of soils and structures' features was taken as the bases of acting normative documents (SNiP). As is known, this principle brings design prerequisites nearer to actual conditions of building structure behaviour and therefore, provides for the improvement of their qualities and more rational material consumption. The introduction of this principle has required a further development of soil mechanics as a whole,the creation of methods for evaluation of soil characteristics, forcasting of final structure settlements and proceeding of settlements within a time period, improvement of mechanical models of foundations to bring them nearer to actual conditions.

A considerable place in Soviet scientists' research work is devoted to problems of natural regularity in strength and deformability of soils.

Methods of investigating into soil characteristics in laboratory and field conditions (sounding,taking cut -offs by rotary boring, dies) and the appropriate equipment have been developed and perfected. That made it possible to issue new state standards for soil study. More and more recognition are winning instruments operating on radioactive isotopes to study building characteristics of soils as well as pressure measuring devices developed for the determination of strength and deformability characteristics of soil.

In association with the development of various regions of this country differing one from another by soil conditions it has become necessary to conduct regional studies into physical and mechanical soil characteristics and to determine their dependence upon natural conditions and chemical and mineralogical factors.

The use of methods of mathematical statistics and a probability theory to systematize data accumulated concerning physical and mechanical soil characteristics has allowed to draw up reference tables of characteristics of a number of series of genetic groups of soils and to formulate the use of probability method for evaluation of soil characteristics. The results of these investigations were reflected in normative documents. Of great theoretical and practical significance are the studies into a theory of fixed water in soils,physical nature of deformation and strength of soils,reology as well as non-linear soil consolidation making it possible to forecast the proceeding of structure settlements on a clay foundation.

Soviet scientists have developed methods for design of foundations on models most closely simulating actual mechanical soil characteristics; a model where modulus of deformation increases with a depth and a model of a compressible layer. Simultaneously with the perfection of models based on classical laws of the linear deformation theory, new models are being worked out. Issuing from it, a soil foundation is considered as consisting of elastic and plastic fields interacting between themselves; or such factors are taken into consideration as a non-linear relationship between stress and deformation,a relationship between a deformation process and a stressed state kind and methods of loading,etc. The first important steps are made in the field of design of foundation settlements with non-linear stage of foundation behaviour. All this is opening the possibility to increase loads on foundations.

Great success has been achieved in designing foundations as solid slabs or crossing strips according to a column grid by using computers. The increase of loads on foundations and the necessity to employ compressible soils as foundation bases have resulted in wide application in construction of solid slabs as foundations for buildings and structures. Computer programs make it possible to design such foundations with any number of columns. Complex calculations taking into consideration the deformation of a substructure and a foundation allow to considerably lower design flexural moments in foundation slabs. Such method of design was used, in particular, while designing the reinforced concrete television tower 533 m high constructed in Moscow, the ring foundation of which is buried only for 4.5m and rests on a compressible foundation (an average diametre -61m, width- 9.5m, thickness- from 3m to 4,5m). Observations have shown almost uniformly and from the onset of the construction it reached 5 cm.

The results of taken in the Soviet Union perennial measurements of deformations occuring in foundations of buildings and structures, have allowed to specify official Building Code of Practice for allowable settlements and their unevenness depending upon a structure, designation and service conditions of buildings and facilities. This work has been continuing at present since observations over deformations open the possibilities to check up the correctness of adopted methods for foundation design.

Soviet science has been paying a great attention to the problem of foundation stability.

While designing hydrotechnical structures, retaining walls and some other facilities, where lateral external forces are great, as well as in cases of construction on weak, water-saturated soils a design of foundation for stability is a must. Parallel with approximated approach to the stability of foun-

dations based on present surfaces of sliding, the idealization of soil characteristics and other simplifications there was suggested a strict, from the mathematical point of view, theory of a soil foundation, any point of which is in a limit-stressed state. Field test studies allowed to make more correct the sphere of applications of theoretical calculations and to indicate practical engineering methods of design.

Quite important investigations determining special conditions of construction have been conducted by Soviet scientists into studying strength and deformability of frozen, subsidence, swelling, selting, peaty and other soils. A special branch of soil mechanics is singled out, this is a mechanics of frozen soils. The investigations in the field of thermophysics, physico-chemistry and mechanics of frozen and thawing soils have played a great part while solving problems connected with the development of Northern and Siberian regions where vast resources of industrial law, fuel and power are concentrated. The II International conference on frozen soil science held in the Soviet Union in Yakutsk from 16th to 20th of July this year was devoted to problems of construction on frozen soils.

Since loess soils characterized by subsidence under watering, are widely spread in the USSR, it explains that great attention paid to them by scientists and engineers. Recently a great number of experimental and theoretical studies were carried out and many new methods of construction were applied, as a result of it, natural regularity of deformations in soils subject to subsidence was found out. In conformity with these regularities there have been developed and applied different methods of construction. These methods fall into three groups: elimination of potential possibilities of subsidence (preliminary compression of a soil, strengthening of structural connections with physico-chemical methods, cutting through a strata subject to subsidence, etc); elimination of the possibility for the conditions to occur when subsidence can happen (water protection measures, reduction of pressure upon the soil, etc.); elimination or relieving the subsequences of subsidence deformations harmful to structures and their service conditions (structural measures, partial cutting through a strata subject to subsidence, etc). Among new methods of foundation construction on soils subject to subsidence it should be mentioned the use of columnar footings in excavations formed by compaction and foundations of driven-blocks.

Resulting from studying the regularities of deformations and structural features of silts, there viscosities and initial adhesion, methods of erecting structures on weak clayey soils have been grounded. There were also studied in detail the eluvium soils of the Urals, the moraine loams of the Byelorussia and the Lithuania, everfrozen soils in many regions of the North and the Siberia.

Extensive investigations have been carried out in the field of utilization of other highly compressible and structurally unstable soils as foundations.

The operations for constructing underground parts of structures are quite labour-consuming. In the Soviet Union they amount to 12-15 per cent of total labour-consumption and up to 20-35 per cent of total time spent on construction. These data show the great significance of economic foundation solutions to be developed (with due considerations of structure safety) combined with the increase of their industrialization degree. The development in this country the industry of prefabricated reinforced concrete and large-panel housing has determined to a large extent the development trends in foundation construction and allows wide introduction of prefabricated foundation blocks on natural foundations and piled foundations. The foundations of prefabricated blocks on natural foundation bases are used in quite considerable scale while constructing civil and industrial buildings.

The increase of economic characteristics of prefabricated foundations have been achieved in two directions: a more complete utilization of the bearing capacity of a foundation taking into consideration allowable deformations of a structure and perfection of foundation structures and methods of their construction. The former was achieved following the use of a limit design for foundations and the latter-due to the typification of structural elements and rational methods of work fulfilment.

In the Soviet Union piled foundations have found a wide application not only when constructing on highly compressible soils but also with mass-scale construction of civil and industrial buildings and facilities in general engineering and geological conditions. Thus, for instance, only at the construction of the Dzhezkazgan copper-smelting plant under the conditions of swelling soils more than 30 thous.piles were driven, and when constructing plants in Krasnoyarsk and Bratsk- 100 thous.piles.

Quite effective is the use of driven piles in regions where everfrozen soils are spread. For instance, the city of Norilsk almost completely constructed on piles 8-10m long which were refrigerated into the soil. More than 100 km of the Messoyakha-Norilsk gas pipeline, the first in the Zapoliarie, were built on piles.

At present the total volume of piled foundations used in the USSR has reached 5 million cu.m. of reinforced concrete per year, including driven piles as well as bored in-situ piles.

The experience of design and construction on piled foundations has shown that their use allows to reduce considerably the volume of earthmoving and concreting, to increase the industrialization level of operations carried out during a zero cycle, to shorten the terms and to cut down the costs of foundation construction, to provide the possibility of carrying out the work throughout the year as well as to increase structure safety and thereby to improve service characteristics of buildings and facilities.

These advantages of piled foundations have become feasible as a result of conducted studies, the improvement of design methods which allow to transfer to piles much greater loads that was permitted earlier, and the development of new pile structures. Here it should be mentioned the structures of pyramid-and prismashaped piles without transverse reinforcement, driven end-bearing piles and tubular piles.

As is known, bored in-situ piles were first used in Russia as early as the last century. The principle of construction of bored in-situ piles now has received the development in the world practice of foundation construction.

Soviet specialists have also made their contribution into the perfection of the methods of these piles construction. Special plants have been developed which allow to manufacture piles according to a required bearing capacity with trunk diametres from 500 to 1700mm, the diameter of their bulbed bottom ends up to 3500mm and the length of up to 33m. Such piles can resist loads from 200 to 2000 tons. When its necessary to drive piles through instable soils and with boring below a ground water table there are used casing pipes or the method of drilling and concreting boreholes with the use of a clay grout. The studies, carried out in the Soviet Union, have shown that a clay grout can be successfully used not only for drilling but also for concreting piles with their reinforcing, including the construction of pile bulbs.

Bored in-situ piles are successfully used while building on loess soils subject to subsidence under moistening, in the Ukraine; while constructing foundations for high-rise dwelling and office buildings in Moscow, while constructing thermal power stations and bridges; while strengthening soilslip lengths of roads in the Crimea, etc. In 1971-1972 a great volume of piling (about 15 thous pieces or 18 thous.cu.m. of bored-in-situ piles) was carried out at the construction of foundations for production shops of the Kama automobile plant. Here piles were used with a trunk diameter of 600mm and the diameter of a widened part-1600mm; piles with diameters of 1000 and 1200 mm were used too. Pile lengths were from 21 to 18m.

There is no doubt that research studies, development and introduction into production of more advanced methods of pile manufacture and more productive plant and equipment for their sinking would further contribute to increase the effectivity of piles foundations.

Beginning from first five-year periods, pressurized caissons and coffers have being widely used in this country as foundations under industrial plant and equipment or as bured parts of production premises and pump stations. As a rule, the area of a pressurized caisson or a coffer did not exceed 300 sq.m. with a sinking depth of up to 12-15 m.

At present coffers are practically completely substituted pressurized caissons and are used in all fields of industrial construction. Over the last five years more then 300 coffers were constructed, their area being up to 2100 sq.m. and a sinking depth-up to 35m.

A substantial progress in the industrialization of work has been achieved with the use of demountable-movable shuttering of ready shields, thin- walled panels-shells, prefabricated reinforcing cages as well as with the mechanization of feeding and pouring of a concrete mix. In many cases the sinking of coffers is carried out with the use of tyxothropic jackets for which, as is known, bentonite clays are used. Conducted studies have shown that ordinary plastic clays activated with different reagents, can be used for the preparation of a tyxothropic solution. The experience of coffer construction with the use of tyxothropic jackets has shown great advantages of this method for the construction of prefabricated large diameter coffers, in particular. The coffer at the Michailovsky floatation mill can serve as an example; its diameter is 37.8m and the sinking depth is 54.5 m. Its knife part 11.5m high is solved in cast-in-situ reinforced concrete with the use of panels-shells; its walls are erected from prefabricated two-void blocks.

The advancement of science and technique has allowed builders to solve a quite sophisticated problem of deep quarries in water-containing soils. During the years of the Soviet power many iron ore deposits were prospected on a vast territory of the USSR. The most important of them are located in the area of the Kursk magnetic anomaly and in the Kustanay region in the Kazakhstan. All these deposits are covered by a considerable strata (in the area of Kursk it exceeds more than 100m) of water-bearing soils with insufficient stability. Developed by Soviet scientists and engineers systems, methods and technology of irrigation and mining allowed recently to put into operation mines with production capacity of more than 40 million tons of ore annually.

A great economic significance in the field of foundation construction acquires a method of enclosure walls and anti-filtration curtains in trenches filled with a tyxothropic clay solution ("a wall in a soil" method). Special equipment was developed to introduce this advanced method into foundation construction in this country.

The successes of soil mechanics to a great extent contributed to the development of drilling and explosion technique in respect to the construction of large-scale facilities. At the construction of the Baypazinskiy hydrotechnical project a powerful explosion (a total weight of charges- 1904 tons) was used to construct a fixed rock fill dam on the Vakhsh river 55m high with a volume of 728 thous.cu.m. By using an explosion method the channel of a central settling basin in the Kuban was constructed; its length-6650m, depth- from 1.5 to 2.5m with the width down the bottom- 3.5 m.

The achievements of this science have contributed in no less degree to wide use of hydromechanization for the development of soil and for monitoring of artificial foundations of profile structures: dams, dikes, embankments for rail- and non-rail roads.

On the basis of studies conducted over many years in the Soviet Union several physical and chemical methods of soil stabiliza-

tion have been developed and are used. They are two-solution, single-solution and gas silikatization, resinization by means of carbamid resins with hardeness, the use of clay-silicate alumosilicate tamping solutions, the compositions of cement-clay solutions substituting cement-sand solutions and some others previously used, including the use of electric osmos. The fields of most rational use of these methods are determined.

The above said methods of soil stabilization were repeatedly employed in foundation construction, in driving underground workings and for anti-filtration curtains. Thus, according to Soviet scientists' suggestion there was successfully achieved an anti-filtration curtain of the high-rise Asuan dam where 1800 thous.cu.m. of soil was stabilized.

The investigations in the field of soil dynamics carried out in the USSR have ensured the working out and the use in construction of vibration methods. By means of vibration methods tens of thousands piles and about 400 thous.tons of sheet piling were driven and more than 100 thous.tons of sheet piling, pipes and beams were pulled out. At the construction of bridge supports this method allowed to substitute thin-walled shells for coffers and pressurized caissons.

The vibration method is successfully used for driving engineering and geological boreholes. By means of a vibration hammer more than 100 million running m. of shallow prospecting boreholes were drilled for the evaluation of soil conditions on construction sites. Hundreds of running kilometres of oil and gas boreholes were bored with the use of the vibration method.

Scientific research in the field of foundation dynamics made it possible to work out methods to design foundations for machinery and other plants exciting dynamic loads as well as contributed to improve methods of designing buildings and structures for construction in seismic regions.

Quite important is the problem of buildings and structures construction in regions with intensive mining. As a result of investigations and generalization of the experience of construction over mining workings there were worked out rational structures of buildings and foundations of either rigid or yielding structural schemes, design methods of forces acting in buildings with earth surface settlement, economic structural measures against violation of service fitness of earlier built buildings where at present there are mining workings under them.

A number of recent scientific studies conducted by Soviet specialists in the field of soil mechanics and foundation construction is described in reports presented by participants of the International Congress. We are hoping that studies by Soviet scientists and engineers will make a contribution into a general matter of the development of building science.

Fig.5. Foyer of the State Central Concert Hall during the interval

CLOSING SESSION
SEANCE DE CLOTURE
ЗАСЕДАНИЕ, ПОСВЯЩЕННОЕ ЗАКРЫТИЮ КОНГРЕССА

CLOSING SESSION

CENTRAL STATE CONCERT HALL, AUGUST, 11,1973

Participants

Prof.Ralph B.Peck,Past-President of the International Society for Soil Mechanics and Foundation Engineering,

Prof. L.Šuklje, Chairman Main Session I
Prof.E.De Beer, Chairman Main Session II
Prof.A.Kezdi, Chairman Main Session III
Prof. G.A.Leonards, Chairman Main Session IV
Prof.S.D.Wilson,Chairman Specialty Session I
Dr.Ju.K.Zaretsky,Vice-Chairman Specialty Session II
Prof.V.S.Kristov,Chairman Specialty Session III
Prof.Bengt B.Broms,Chairman Specialty Session IV
Dr.G.P.Tchebotarioff,Chairman Specialty Session V
Prof.N.N.Maslov,Chairman Specialty Session VI
Prof.H.Cambefort,Chairman Specialty Session VII
Prof.Shamsher Prakash,Chairman Specialty Session VIII

Prof.J.Kerisel,President of the International Society for Soil Mechanics and Foundation Engineering
Prof.N.A.Tsytovich, President of the USSR National Committee for Soil Mechanics and Foundation Engineering,Vice-Chairman of the Organizing Committee
Mrs.Nash
Prof.I.A.Ganichev,Chairman of the Organizing Committee,Vice-Chairman of the GOSSTROY USSR

Prof. Ralph B.Peck

My opening remarks will be devoted to a few items of business before we turn to the summaries of the work of the sessions.

First, I should like to acknowledge the presence of at least two members who have attended every Conference of our International Society: Harvard-Rotterdam-Zürich-London-Paris-Montreal-Mexico City-Moscow. One of these is Professor Spencer Buchanan; the other is Dr.Gregory Tschebotarioff.

Second, I should like to express our appreciation to our outgoing vice-presidents. They have looked after their regions with great attention and have represented our Society on many occasions. I am personally grateful for their help and cooperation through these four years. Mr.dos Santos and Professor Mogami are unable to be here. I should like Professor de Beer, Dr.MacDonald, Professor Davis and Mr. Perez Guerra to stand for our thanks.

I should like also to announce your new vice presidents: Professor Kezdi for Europe, Professor Marsal for North America,Professor de Mello for South America,Dr.de Graft Johnson for Africa, Professor Moh for Asia,and Professor Taylor for Australia. All but Professor Taylor are here, and I would ask them to rise.

You have, of course, also elected a new President. I shall present him a little later, at the end of my Presidential Address.

Our Society has joined in cooperative efforts with the International Society for Rock Mechanics and the International Association of Engineering Geology. This cooperation is symbolized by the presence at our meeting of the Executive Committee and at the Conference of the Secretary General of the International Association of Engineering Geology, Dr.Wolters, We welcome him.

It is impossible to imagine how our Society could have functioned without the limitless service and devotion of Secretary-General Nash. He has served all of us unsparingly,, with remarkable efficiency and unending good humor. He is the one person who keeps the Society alive and moving. He is a joy to work with, and I propose we express our appreciation.

Shortly we shall hear brief reports of the Main Sessions and of the Specialty Sessions. I should like first to mention the other ingredient of our program each day,the Special Lectures. I am sure we all appreciate the effort devoted to their task by Professor Kerisel, Professor Tsytovich, Professors Scott and Cherkasov, and Professor Fukuoka and Mr.Nakase. We have caught a glimpse of the grandeur of the intellect of Coulomb; we have seen the accomplishments and possibilities of the cosmomechanics of rock and soil, and the progress in investigating the sediments of the ocean floor. And,in Dr.Ganitchev's opening address, we met the broad scope of our profession and its accomplishments in the USSR

We shall now turn to the reports of the Chairmen on the Work of the Main Sessions.

Prof. L.Šuklje. Chairman Main Session I

The first main session has been devoted to laboratory and field testing of soils for their strength and deformability. 77 papers had been submitted and have been printed in the volumes I/1 and I/2 of the Proceedings of the Conference.

The prevailing part (about 60%) of the papers deals with stress-strain and stress-strain-time relationships for soils or with their strength as observed and measured in laboratory tests. Testing devices have been improved. True triaxial devices, plane strain and ring torsion apparatuses have been further developed and automatic recording has been widely applied. The influence of stress-state,stress paths,stress-and strain history, of creep, loading rate and load duration onto the rheological relationships and the strength has been thoroughly investigated. The experimentally obtained relationships have been given analytical expressions or checked with respect to theoretical rheo-

logical models. The dynamic effects and the role of the saturation degree seem, however, to have being paid less attention than expected as to their importance in foundation and earth-structure engineering.

About 10% of papers bring experimental and theoretical studies on soil structure of either granular or cohesive media. Further 10% (something more) of communications discuss various applications of soil parameters in geotechnical design or give information on full-scale observations and measurements comparing them with predictions based on laboratory testing.

Hardly 20% of reports deal with topics which have been payed special attention of the General Reporter and which have been selected for the discussion at the Session. These topics concern: (1) in situ devices, (2) predictive techniques based on in situ measurements of soil parameters, (3) laboratory model tests, especially the centrifuge test, and (4) use of probability and decision theory in practical soil engineering problems.

Eight papers and nine discussions were related to the first two selected topics. The pressuremeter Kögler-Menard and its refined versions have been the subject of special attention. Many successful efforts were made on causing the minimum possible disturbance to the soil, and new theoretical models have been used to interpret the field data. Pore pressure measurements have facilitated, to some extent, even the interpretation in terms of effective stresses. Limitations in using the test data are governed by test conditions concerning initial and additional stress-state and orientation, anisotropy, permeability, saturation, test duration, etc.

Field vane tests are still widely used to get undrained shearing resistance. Disturbance due to insertion, effects of delay time prior to running the test, rate of rotation and strength anisotropy cause incertainties in deducing the cohesion to be applied in stability analyses; effective stresses cannot be considered.

Screw-plate compressometer has been used to determine compression moduli of sand and silt, and large diameter plate tests at various depths were successfully carried out in stiff-fissured clays and soft rocks.

Only one paper has reported improvement on techniques for obtaining undisturbed soil samples.

Centrifugal model test is receiving increasing interest. Four authors and four debators have reported on its applicability to soil engineering problems or on the limitations in applying it to real situations.

Very limited information has been obtained as to the use of probability theory in solving geotechnical problems. The discussion was related mainly to its application in determining representative soil properties.

A complete review of the papers presented to the first Session has been given in the General Report, yet emphasis has been given to developments of immediate and near term value to the practicing engineer. Besides the Conference papers, several remarkable publications issued subsequent to the 7th International Conference and concerning the subjects of the Session, have been considered in the state-of-the art presentation.

Thirty four written constributions to the discussion have been presented to the Organizing Committee. Twenty two of these contributions concern the selected topics. Owing to time limitation, only sixteen debators could orally express their experience and ideas. The publication of all written contributions, at least those related to the selected topics, might be recommended.

I wish to express our thanks to all participants of the Conference who have contributed by their communications and discussions to the success of the session. We appreciate very much the efforts made by the members and assistants of the Organizing Committee in preparing the Proceedings and in organizing the Session. Our special gratitude has to be expressed to the General Reporter Professor Lambe for reviewing and evaluating all published works covered by the Session.

Prof. De Beer E. Chairman Main Session II

A cette seance de cloture j'ai l'agreable mission de faire rapport au congres concernant les travaux de la deuxieme session consacree au theme "Interaction entre le sol et la structure, y compris le probleme de la prevision des tassements, le calcul des fondations massives d'apres la methode de l'etat limite et le calcul de poutres flexibles et de dalles".

Pour couvrir ce sujet, qui est a la fois l'un des plus importants et des plus difficiles de notre specialite, le comite organisateur a fait appel a deux rapporteurs generaux, le professeur Gorbounov-Possadov, continus, et d'autre part le professeur Davydov, de renommee mondiale dans le domaine du calcul des structures.

L'interet suscité par le theme choisi est e.a. demontre par le fait que 24 congressistes se sont presentes pour la discussion orale. A cause de la limitation du temps les rapporteurs generaux n'ont pu retenir que 12 discussions. Comme certaines des contributions qui n'ont pu etre presentees oralement, contiennent toutefois des elements valables, j'espere que celles-ci pourront etre incluses dans les comptes-rendus de la conference, sous forme de discussions ecrites.

Le Professeur Krsmanovic, en temps quo vice-president de la session, a dans une courte intervention presente une classification des differents cas d'interaction sol-structure qui peuvent se presenter dans la realite.

Les rapporteurs generaux avaient indique 6 themes de discussion. En outre ils ont formule 6 conclusions ainsi que 5 recommandations pour le calcul pratique des fondations.

Dans le temps limite qui m'est imparti, il n'est malheureusement pas possible de parcourir toutes ces conclusions et recommandations, que vous trouverez dans le rapport general.

Je dois me borner simplement a vous citer quelques points qui ont particulierement attire mon attention, et qui, a mon avis, peuvent etre consideres comme un acquis de ce congres:

1) en ce qui concerne la prevision des tassements il y a une tendance certaine a se baser de plus en plus sur des essais in situ. En Union Sovietique cette evolution s'est deja faite depuis longtemps, le calcul des tassements y etant base sur des essais in situ avec des plaques de grandes dimensions.
2) Dans le cas de sables et d'argiles raides la deformabilite diminue rapidement avec la profondeur.
3) Ni la methode du coefficient de raideur, ni celle du module de deformabilite constant,ne permettent generalement pas de refleter fiedelement les caracteristiques reelles des sols.
   Un modele moins errone peut etre obtenu en considerant un module de deformabilite qui croit avec la profondeur.
   Une autre approximation utilisee en Russie consiste a faire le calcul en utilisant un module d'elasticite constant determine a partir d'essais a la plaque, mais en limitant fortement l'epaisseur comprimee de cette couche fictive.
   Il existe d'ailleurs des ouvrages qui permettent d'utiliser la methode du module de deformabilite constant,sans plus de difficulte que celle du coefficient de raideur.
4) Des economies non negligeables peuvent etre obtenues en calculant les semelles en plasticite, pour autant que des precautions soient prises contre les dangers de corrosion.

Les conclusions et recommandations des rapporteurs generaux soulignent aussi la necessite, afin d'obtenir des solutions plus correctes, de tenir compte de la rigidite de la superstructure, d'introduire l'influence des phenomenes de fluage tant dans le sol, que dans les materiaux de construction, de la formation eventuelle des zones plastiques dans le sol sous le bord des radiers,et enfin de l'influence des contraintes tangentielles dans le plan de contact. Il me semble toutefois que ces influences quoique importantes, peuvent etre considerees comme etant de 2e ordre, et que le point essentiel est de pouvoir representer la deformabilite du sol par un modele aussi fidele que possible.

Les travaux de la session ont permis aux participants de prendre connaissance des methodes d'investigation et de calcul utilisees en Union Sovietique et qui se distinguent assez nettement de celles utilisees dans d'autres pays, ou le calcul des semelles et radiers se fait encore souvent par la methode du coefficient de raideur et par un calcul en elasticite du radier.

Grace aux machines electroniques des problemes mathematiques fort compliques peuvent etre actuellement resolus. L'obstacle a une solution plus correcte du probleme ne reside donc plus essentiellement dans les difficultes du traitement mathematique, mais bien dans l'insuffisance de nos connaissances des proprietes de deformabilite du sol, et dans les difficultes d'introduire ces proprietes de deformabilite non lineaires dans les programmes.

Afin de faire avancer nos connaissances je puis, avec les rapporteurs generaux exprimer le voeu que le comportement des fondations d'un certain nombre de batiments importants, puisse etre soumis a une observation scientifique grace a une instrumentation complete et puisse etre analyse a partir d'une etude geotechnique prealable. Il serait alors utile de faire rapport concernant ces observations lors de l'un des futurs congres regionaux ou internationaux.

Grace au travail des auteurs de 46 contributions ecrites, au rapport magistral des rapporteurs generaux,des commentaires du Professuer Krsmanovic,et de la discussion orale, la session, dont j'ai l'honneur de faire rapport, a permis de realiser des progres dans le probleme du calcul economique des radiers et semelles appuyees sur le sol.

Pour terminer je voudrais remercier le Comite Organisateur pour avoir choisi ce probleme important comme theme de l'une des sessions principales,et tous ceux qui ont contribue aux travaux de la session, et tout particulierement les rapporteurs generaux pour le travail qu'ils ont bien voulu fournir.

Prof.Kezdi A., Chairman Main Session III

Mr.Chairman,Ladies and Gentlemen,

Pile foundations and other deep foundation methods are gaining more and more importance, therefore, it is no wonder, that this Session aroused great interest among the participants of this Conference. The great importance of this method is mainly due to the possibility of complete mechanization of the foundation work, and this is a particularly favourable feature today when labour is getting everywhere more and more expensive.

Another factor of the increasing use of deep foundations is that in many places we are short of soils with an adequate bearing capacity which would facilitate the construction of shallow foundations. The ever increasing size, weight, loads and sensitivity of our structures also call for methods which ensure high bearing capacity and small settlements. Besides, the great facility to adopt these methods to the various requirements is also an important source of advantages.

Our distinguished General Reporter, Professor Zeevaert discussed and evaluated in his report the papers published in the Proceedings and he has drawn three conclusions. He emphasized the increasing importance of deep foundations,the necessity of investigating the deformation characteristics of piled foundations, in order to promote design based on the so-called second limit state, which means the design for permissible settlements; and, thirdly,the need for comp-

lete documentation of the soil data.

He also presented his comments on the papers, therefore, I think, I have to give here account on the oral contributions. We obtained 33 or it, so, it was quite a difficult job, to make a proper selection of 12. Since the field is very complex and the problems are interwoven, it is quite clear, that any selection is defective and objectionable therefore we have to apologize for having made just one from this possible category.

The contributions presented orally treated first the problems of negative skin friction. Studies on the cohesion and adhesion of soft clays, where this problem is important, will tell us whether a slipping between a skin of soil carried down by the pile and the adjacent soil will occur or a slipping between soil and pile surface will be possible. We learned about suitable methods of the application of bituminous coatings which act as a solid material during fast deformation and as a fluid during slow deformation; also, the requirements for these coatings have been summarized.

The second group of the discussions was concerned with the strength and compressibility of the soil layers around and below piles. We heard about laboratory model tests which aimed at determination of the effect of K_o and the strength and deformation characteristics, about the proper use of penetration testing for that purpose. Measurements on constructed slurry trench walls will greatly add to our knowledge on this method. The same is true for measurements of the load transfer, and, in my opinion, it would be a very fruitful job to collect all the data on load transfer which were published in the literature and to evaluate them on a common basis. We could also collect and evaluate data on horizontally loaded large diameter piles, which are used today for many structures. We have heard here about a method using the calculations with finite elements.

The environmental factors have, as stated by the General Reporter, a major influence on the behaviour of the piles. One of them is the effect of earthquakes which was discussed in one of the contributions; another the problems of piling in an area where extensive mining is taking place. Horizontal cyclic loading may sometimes be not detrimental but it may increase the bearing capacity.

The other contributions were concerned with model devices, horizontal loading, piling in swelling clays, with underground construction interaction of piles, some special construction procedures, anchors and other problems; several of them will appear as written contributions in the final volume of the Proceedings.

Our next job, in connection with pile foundations has to include the performance of the following tasks:

- collecting data on construction methods and working out recommendations in order to improve them;
- collecting and evaluating data on pile load test, published in the literature, and to put together the requirements for a proper load test, in order to make a statistical evaluation possible;
- collecting data on the load transfer in piles; finally
- making a survey on the results of the application of sounding method.

I think these are tasks which can be accomplished in close collaboration of the National Societies.

Prof. Leonards G.A., Chairman Main Session IV

Thanks to the efforts of the late Dr. Bjerrum, I believe that the profession will now initiate a comprehensive re-examination of routine procedures for estimating the stability and settlement of structures on soft ground. The red stars pointing to major problem areas are very distinct:

1) Embankments and cut slopes in soft, highly plastic clays,
2) Passive earth pressure, especially in clays of low plasticity,
3) Short-term and long-term bearing capacity of friction piles in soft clays and, MOST IMPORTANT,
4) The problems associated with the prediction of field performance on the basis of laboratory tests on undisturbed samples, or on the basis of existing in-situ strength and compressibility measurements.

When you have had the opportunity of studying the written version of Bjerrum's general report, and of the cogent oral discussions presented in Session IV, you will find many avenues for fruitful investigations both in the laboratory and in the field.

The advantages of an empirical design procedure are simplicity, speed, low cost, and relative reliability within the range of the empirical correlation. However, I wish to underscore the comment made by Prof. Peck when he stated that the empirical correction factors proposed in Dr. Bjerrum's report were based on stability analyses which may not be consistent with in situ behavior. In the case of embankments and of excavations in soft ground, I am convinced that the theoretical framework of the analysis is INCORRECT and that relying solely on field measurements will not lead to substantial improvements in design procedures. I can think of no clearer example in support of this contention than our experiences with the design of road and airfield pavements during the last 3 to 4 decades. Hundreds of field measurements and thousands of observations of unsatisfactory performance have not led to better ways of designing pavements when conditions change beyond the scope of available experience.

Dr. Aitchison's report was comprehensive, philosophical, and controversial. I wish to express my apologies to those discussors - especially to Dr. Van Ganse of Belgium - who were denied an opportunity to express their views orally due to the inadequacy of the Session Chairman. I am certain you will find

their written contributions most rewarding.

In my opinion, the difficulty underlying our inability to predict reliably collapse and swelling phenomena is the incorrect framework within which the concept of effective stress in partly saturated soils has been formulated. I propose that the International Society appoint a Commission to establish guide-lines and to integrate world-wide research efforts directed towards elucidating this question.

Prof.Stanley D.Wilson, Chairman Specialty Session I.

Allow me to announce briefly the results of the discussions that have been held in the Specialty Session No.I, "Equipment for Observation of Settlement and Stresses of Bases".

The prepared part of the discussion consisted of 11 reports; in addition there were 7 speakers. Six reports were devoted to the construction of devices for measuring the vertical and horizontal displacements of soil, as well as to the problem of measuring the settlements of structures. Four reports dealt with the design of devices for measurering the stresses in the soil and with the development of methods for evaluating their safety. One report was devoted to the automatic recording of tests and the use of a computer for the evaluation of the data.

The oral speakers raised the question of the accuracy of the devices used for measurements. The improvement of devices for the observation of settlement, as well as the problem of necessary accuracy of measurements, was also discussed.

The following important problems remain in order to obtain reliable data on the behavior of bases and structures;

1) The development of methods and devices for measuring the vertical and horizontal deformations and settlements of bases with much more accuracy than with those now existing.

2) The improvement and use of simple and cheap methods for the observation of settlement (for instance, hydraulic methods).

3) The development of methods to measure the horizontal movements of soil layers (for instance, in landslides) when the measuring process is required continuously for a long time.

4) The development of methods for placing the devices used for measurement of stresses, natural strains and pore water pressure into soils without introducing errors.

5) Increased application of up-todate automatic measuring complexes with remote reading capability and the data automatically computed.

The solution of these problems would permit us to determine the stress-strain state of bases with a greater accuracy, which in turn will help to solve the problems raised in the main sessions of this conference.

I would like to express my appreciation to my co-chairman and to the technical secretary of the Session I for their assistance and whole-hearted cooperation.

Thank you for your kind attention.

Ju.K.Zaretsky, Viche-Chairman Specialty Session II

Mr.Chairman, Ladies and Gentlemen, Colleagues!

I have the honour of reporting on the results of Specialty Session No.2 "Problems of Nonlinear Soil Mechanics". The Organizing Committee asked the participants of this Session to discuss certain aspects of nonlinear soil mechanics. Two problems were proposed for discussion.

1) Computation algorithms and an analysis of the stressed state of a nonlinearly deforming soil base, the use of the "finite elements" method, the "elastic solutions" and other numerical method for solving problems in soil mechanics on the basis of nonlinear relations between stresses and deformations.

2) Nonlinear consolidation of highly compressible soil bases: methods of calculating the settlements and pore pressures in highly compressible saturated soils.

To our great regret, the Chairman of this Session, Professor Poorooshasb, could not come to the Conference, but he has sent us his opening speech where he deals in concise form with twenty written reports that were submitted prior to the Conference. He ends his speech by proposing two additional problems for discussion.

The first of these is: what is the nature and the form of the yield surface of soils? Does yield surface traced in a stressed space contain a space diagonal?

The second problem is: the discrepancy between prediction by means of the classical Terzaghi theory and prediction by means of experimental data is explained in the majority of cases by the inaccuracy of the initial information regarding the soil factors involved rather than by the inadequacy of the simple classical theory. Twenty two persons took part in the discussion.

We heard very interesting reports on methods of solving problems in nonlinear soil mechanics (Wroth, Great Britain; Goldin, USSR; Solomin, USSR). Results obtained in solving the problem of the settlement of a nonlinear anisotropic base were presented by Vinokurov (USSR) and those for a homogeneous nonlinear deformable half-space by Zaretsky (USSR). Many reports were devoted to the problem of the consolidation of highly compressible clayey soils. Of especial interest were the reports of Prof.Šuklje (Yugoslavia) and Prof.Mikasa (Japan).

We expected a more active discussion on problems concerning the working out of computation algorithms, and new ways of applying discrete methods in solving problems in nonlinear soil mechanics. We cannot say, however that new ideas were revealed during the Session or new methods proposed. Such important problems as the convergence of the iterative process to a precise solution, as the existence and uniqueness of solutions, etc., were not mentioned at all. We can only say that the finite element method, the difference-differential and the variational-difference methods can be applied in practice

for solving engineering problems in soil mechanics if the nonlinear physical laws of deformation are taken into account.

At the same time, much attention was given to the formulation of the laws of soil deformation in the form of the deformational plasticity theory,as well as in the form of the theory of the strain increment and the theory of the plastic potential (Drescher, Poland; Feda, Czechoslovakia, Wiener, GDR; Thamm,FRG. Professor Kisiel (Poland) proposed a rheological equation of state based on the theory of absolute reaction rates for clayey soils containing more than 20 per cent of the clay fraction.

Although the problems raised in the abovementioned reports were not given in the program printed in Bulletin B,they are of "vital importance" in the final analysis. I regret to say that the problem of equations of state for soil systems remains unsolved as yet.

In conclusion it should be pointed out that the interest exhibited by specialists to the subject-matter of Specialty Session No.2 can be explained by the fact that it becomes more and more evident that it is essential in designing bases and foundations of structures to take into account the actual mechanical properties of soils that characterize its nonlinear reaction to loads. Taking into consideration the actual mechanical properties of soil bases in designing foundations of structures is by no means settled by seeking to obtain the nonlinear relation of "settlement-load'. It will more substantially affect the diagrams of reactive pressures and the magnitudes of the bending moments in the foundations of structures.

It is my opinion that if such an approach is adopted it will no longer be necessary for various investigators to propose artificial design schemes for solving contact problems, classical examples being the scheme of the layer of limited height,the Winkler base, etc.

During the Session we,naturally,could not cover all the problems in nonlinear soil mechanics, but the fact that many specialists responded to them speaks of their urgency and timeliness. In my opinion the Session was useful and fruitful. I want to thank all those who participated in Specialty Session No.2 for their kind interest. Thank you.

Prof.Eristov,V.S., Chairman Speci
Session III

Dear Chairman,Dear Collegues,
Our Specialty Session No.3 dealt wi
design and construction of high earth and rockfill dams.

The building of earth and rockfill dams progresses intensively both within and outside the Soviet Union during last decades. For instance,554 dams out of 620 (or 91%) being constructed for the last five years in the USA were of earth and rockfill type. Just the same may be seen in other countries including the Soviet Union.The adoption of embankment dams depends upon many factors, but first of all by the fact that dams of local materials may be placed on foundations having complex geological texture with more economical means compared with concrete dams. The earth and rockfill structures have become more and more high. If previous dams reached some ten meters high,at present they amount hundred of meters,for instance Oroville Dam in the United States has 224m high, Mica Creek in Canada-235m high, Nurek Dam in the Soviet Union-300m high, , Rogun Dam also in the USSR- 325 m high. That is why we we often meet new and complicated problems as quantity usually implies transition to quality, and these are first of all soil and rock mechanic problems. That is why all those connected with designing and construction of dams are grateful to the International Association on Soil Mechanics and Foundation Engineering for the organization of our specialty session in the 8th International Congress on Soil Mechanics and Foundation Engineering. There are still many problems that have to be solved and that according to the data of the International Committee on Large Dams there exist some dams in the world which are under dangerous conditions.

For about 400 participants have taken part in the work of our specialty Session. We have been sent 23 scientific papers and 20 reports were delivered orally. All of them were of great importance. The conclusion can be made that the finite element method is widely used for stress-strain analysis of earth and rockfill dams. The comparison of evaluation methods with the field results showed good agreement.

Ing.Dolezalova (CSSR), Volski (PNR), Penman (Great Britain), Habib (France), Rasskazov (USSR), Kawamoto (Japan),Katti (India), and Uriel (Spain) confirmed this statement by their oral contributions. So, in my oppinion the finite elemtn method may be recommended for practical purposes in solving non-linear problems. At the same time prof. Mojevitinov (USSR) reported about development of the stability analysis based on classical method of slices and ing.Perlea deals with the method of ultimate equilibrium. Very interesting dynamic problems were delivered by Prakash (India), Rasskazov (USSR). Dynamic problems are extremely important now, as several high earth and rockfill dams are under construction in the areas of high seismic activities (from 9 to 10) such as Middle Asia in the USSR. Impressive contributions concerning stress and strain measurements in situ were made by Wilson (USA) and Los (USA). Model investigations were delivered by Vucel (USSR). These methods also can be recommended for use.

And at last we have got a very interesting information about construction such high dams as Ilha Solteira on Parana river (Hsu-Brazil), Talbingo in Australia (Hosking) and Tarbela in Pakistan (Low).

I believe the work of the Specialty Session 3 was fruitful and held in atmosphera of international cooperation among scientists and engineers in the field of soil mechanics and its practical applications and that is what we are longing for, I suppose.

In conclusion, let me thank on behalf of Specialty Session the President of ISSMFE prof.R.Peckas well as the authority of the Organizing Committee prof.Ganichev,Tsitovich, Malishev, Trofimenkov and the General Secretary N.S.Chetyrkin for good organization of the Congress. I'd like to congratulate prof.Kerizel on the occasion of being elected as the president of the ISSMFE and to wish him good luck. Thank you.

Prof.B.B.Broms, Chairman Specialty Session IV

The specialty session on "Soft Soil Bases of Concrete Hydrotechnical structures" focused the attention on the effects of progressive failure and liquefaction on the foundation strength and the stability of gravity and buttress dams,offshore structures,locks,drydocks and ligthouses. It was pointed out that the risk of progressive failure must be considered in the design of such structures particularly when they are founded on overconsolidated plastic clays. A reduced shear strength between the peak and the residual strength should be used.

It was also pointed out that earth quakes, blasting and wave forces can cause liquefaction in fine uniform sand. Liquefaction occurs when the pore pressure increase caused by cyclic loading approach the initial vertical effective stress in the soil. The development of liquefaction is dependent on such factors as the shear stress ratio in the soil, the initial relative density and on the drainage conditions.

Attention was also focused at this specialty session on the use of the finite element method for the prediction of settlements and lateral displacements. With the finite element method it is possible to study the effects of such factors as creep and consolidation. The success of the finite element method is, however, dependen to a large extent on how accurately the soil parameters used in the analysis can be determined. It is necessary to pay more attention to the development of in situ testing methods for an improved prediction of these parameters.

Hydrotechnical structures are frequently large. Size effects becomes important when the results from small scale testa are analyzed and applied as pointed out by Mazurkiewicz. He found that the measured settlements of a dry dock were considerably smaller than those predicted from plate load tests or from oedometer tests.

Giroud discussed the rotation of rigid slabs founded on a compressible elastic foundation. The results were presented in the form of nomographs. Giroud has investigated also the area (core) within which a vertical load will only cause compressive stresses below flexible or rigid slabs.

Samarin presented a method to calculate the lateral displacement of rigid structures by considering first the deformations at the time of loading and then the time dependent deformations.

Fukuoka described the design of the Sabaishigawa dam in Japan which has been constructed on soft sandstone and mudstone. The strength and deformation properties of the foundation materials were evaluated by in situ direct shear tests. The dam and the foundation was analyzed by the finite element method.

The design of a concrete dam founded on silt was discussed by Balissant. The dam was provided with two cut off walls and an apron to reduce seepage below the structure. The cut off and the apron were analyzed as a rigid frame supported on elastic springs.

Savey described the design of a 265 m long lock which has been constructed on clay, clayey silt and peat. The shear strength of the soil was increased by preloading. Sand drains, reinforced with fibre glass wicks, were used to increase the consolidation rate. The observed settlements were larger than the calculated settlements.

Intermission.

Chairman Prof.R.Peck,

Now we shall continue listening the reports of the Chairmen of the Specialty Sessions

Dr.Gregory P.Tschebotarioff, Chairman Specialty Session V.

Mr.President,dear colleagues,ladies and gentlemen!

The following main points were discussed at the Specialty Session No.5 on the lateral pressures of clayey soils on structures:

First, it was agreed that the term "arching" includes two different phenomena,namely the sliding and the wedging of soil grains. But there was no unanimity of opinion as to whether this fact should or should not impose limitations on the use of the term "arching". This question will be referred to the Committee on Terminology of our Society.

Second, it was agreed that the present methods for the determination of lateral pressures against the sheeting of deep braced cuts are inadequate and require revision. Proposals were advanced indicating the direction these revisions should take.

Third, two new methods for the in-situ determination of lateral pressures in natural clay deposits were discussed and compared, namely the Norwegian method of hydraulic fracturing and the French "sonde-autoforeuse" procedure which appears to have eliminated the basic flaws of the older Menard type pressiometers. The hydraulic fracturing method was found to give somewhat higher lateral pressure values than the "sonde-autoforeuse" at the same site.

This Reporter's personal opinion is that the development of reliable instruments which could continuously record the changes in lateral pressures at different points before, during and after construction is essential to permit further advances in this entire field.

Fourht, the lateral loading of piles was discussed. A new method for the determination of bending stresses in piles due to unsymmetrical surface loading was presented in outline. It appears to provide an experimentally sound and theoretically rational basis for design practice. The lateral loads on groups of piles were also discussed.

Finally, several valuable theoretical contributions were presented in outline form which I cannot attempt to describe in the short time available to me now. I am sure that they will all be of considerable interest to specialists in this field.

I would like to express my sincere appreciation of the contributions to Session No.5 by the two Vice-Chairmen,the nineteen discussors and the Recording Secretary. I also thank my Soviet colleagues of the Organizing Committee for having invited me to chair this Specialty Session on m: native soil.

Prof.N.N.Maslov, Chairman Specialty Session VI

Mr.President,Ladies and Gentlemen,Friends and Comrades!

Specialty Session 6, concerning the stability of slopes of deep excavations and natural slopes,was of great interest to the participants and guests of this Conference. About 500 persons took part in the Session.

Reports were presented by the Chairman of this Session, the Vice-Chairmen, Professors A.Bishop (England) and S.N.Maximov (USSR). There were also registered reports and free discussions from the floor, 17 in all. Such well-known scientists as Prof.Bishop (England), Prof.Janbu (Norway), Professors Saito and Fukuoka (Japan), Prof.S.S.Vyalov, Prof.G.I.Ter-Stepanyan, Prof.E.P.Emelyanova, G.S.Zolatorev and others took part in our Session.

We assume that the interest displayed by so many specialists in our Session was due to the expediently formulated topics for discussion:

1. An evaluation of the existing methods of calculation in view of observations made on real landslides.

2. On the influence of diverse natural factors, and means of taking them into account.

Concerning the first topic,reports made by Soviet specialists (S.N.Maximov, V.D.Braslavsky,Nguen Chap) were of great interest. Reports made by Mr.E.Slunga (Finland), Mr.Madei (Poland), Professor T.Yamanouchi (Japan) should also the mentioned. However, in our opinion not enough attention was paid to this very important problem.

A significant convergence has been established between the results of up-to-date calculating methods and field data upon the presenc of natural slip surfaces and, at the same time,in many cases a divergence is found between them in the evaluation of the degree of slope stability when the position of the slip surface has to be established. However, concerning the last case, a close convergence has been established between results of calculations carried out by various methods which were suggested by different authors. It follows that it would not be expedient to work out new calculation methods if the principle of the design procedure is not based on a fuller range of natural factors that influence landslides.

This circumstance led to a substantial number of reports concerning the second topic (natural factors). Here the report made by Prof.A.Bishop (England) on the role of the pore pressure theory in the analysis of landslide processes was of great interest

especially in view of the density-moisture content theory that is widely applied in the USSR. The importance of rheological phenomena in the landslide process were dealt with in detail by a number of reporters, such as Mr.Wackernagel (Switzerland), J.Feda (Czechoslovakia), G.I.Ter-Stepanyan, A.Ya. Turovskaya, S.S.Vyalov (USSR). Reports on the possibility of predicting the time of landslide occurrence and the influence of landslide phenomena dynamics on the form of their development made by A.Saito (Japan) and Professor E.P.Emelyanova (USSR) were of great interest.

All the reports and free discussion from the floor were of great interest to a large number of those present and undoubtedly will facilitate a further development of one of the most important problems of soil mechanics landslide phenomena. In this development, priority should be given in designing to specific natural factors. This concerns, in particular, rheological phenomena that can lead with time, and at certain conditions to a decrease in strength of the clayey soils making up the slopes. However,it should be pointed out that,judging from the experience of the work of Specialty Session 6, it could have been more fruitful if the reports had been published prior to the Conference. From this point of view it would be expedient to include the problem of the stability of slopes of deep excavations as a Main Session in the program of the IX International Conference on SMFE.

In conclusion allow me to thank you, Mr. President, and through you the Organizing Committee and all the participants of Specialty Session 6. Thank you.

Prof. H.Cambefort, Chairman Specialty Session. VII

Mr.Chairman, Ladies and Gentlemen,

Soils consolidation involves numerous possibilities which we had to restrict for that Section 7 as all the matters could not be dealt with in two hours and a half. That is why it has only been spoken of chemical grouting,congealment and slurry walls. It led me to refuse numerous papers which were for sure very interesting but did not answer the questions to be dealt with. I am the first to be sorry for it and I beg their authors to excuse my strictness.

The questions were connected with construction-methods that have been used for a more or less long time and that concern only the Engineers'Art in which mathematical developments are of little use. Therefore,it was difficult to give an original answer and that must be the reason why there was none about congealment. Fortunately a few oral interferences filled this void.

One must consider it a success that there was five or six papers dealing with true original methods which had successfully been tested on the working site and which were only waiting for similar cases to be developped.

Among these new processes injections with a stream of grout propelled at great speed must attract attention. With this process described by MM.Yahiro and Yoshida grout is, at last put where it must be and not left to go where it wants to. No doubt a few little technological perfections must be made, particularly concerning the great abrasive quality of the particles of cement. But with other grouts numerous applications have been executed.

This method allows to carry out impervious curtains to the soil surface,which is quite impossible with classical grouting. It must also allows to carry out economical impervious horizontal bottoms,and so,probably at any depth.

One can be sure that such a method will be of importance for grouting of cohesionless soils.

Two other processes,far from similar one to the other,allow to consolidate soils by quick settlement. These are:

- intensive ramming according to L.Menard process as described by MM.Professors De Beer and Van Wambeke.
- and the use of explosives according to Mr.Litvinov's method.

Both processes apparently very different one from the other seem to have in common the liquefaction of soils under vibrations effect. It is said that thanks to this liquefaction the particles of soil can be drawn tighter and so better the mechanical strength of the layer.

Liquefaction of soils under vibrations effect is,at present, almost unknown. Only a few investigations,which I would call roughed out,were undertaken to understand earthquake effects but that is not enough to explain the effects of ramming and of explosives. There, we are taking up a new chapter in soils mechanics which we must develop seriously to understand what is happening to the soils, and so better the processes.

It is amusing to see that, once again, methods that were perfected on the working sites are satisfying even if we do not really know why. Such is the case for piles concreted under mud,which are as good as those realized under pure water,for injections for which nobody ever gave an equation. But that does not mean it will be the same for both of these new processes and I hope that when we will meet during next Conference we will have genuine explanations.

I am almost ashamed to say I learnt during this session that there was,in the Soviet Union,dams with impervious core made from frozen soils and that such a congealment was merely realized by circulating external air through suitably set out pipes. To the Engineer countries were this method can be applied are clearly privileged.But it may not be the same for the inhabitants.

Gentlemen,these are the main points that were treated during session 7 which was,as you can see,really fruitful.I hope these new processes will have an important development.

Prof.Shamsher Prakash, Chairman Specialty Session No. VIII

Mr.Chairman, Ladies and Gentlemen,

The theme of the Specialty Session VIII is "Soil Dynamics and Seismic Effects on Foundations". The four themes accepted for the session were (i) Stress-strain characteristics of soils, especially under high pressure, (ii) Foundation vibrations, (iii) Soil structure interaction and wave propagation and (iv) Liquefaction of soils.

19 scientific reports had been accepted for this session, 16 discussions were orally presented. The following points were highlighted in this session.

1. Effect of vertical component due to earthquake needs be appropriately taken into account while studying response of such structures.

2. Question of dependence of shear modulus and damping on strain level was clearly identified.

3. Foundation vibrations and wave propagation were the subjects of discussion in 3 scientific reports and localized problems only were highlighted.

There was a very stimulating discussion on liquefaction of soils,more importantly on the following themes:

4. A new area on liquefaction of soils on slopes was identified. Almost no work on this theme has been reported in the published literature so far.

5. Simplified procedures to evaluate possibility of liquefaction from standard penetration values and the anticipated ground motion were discussed. However, results obtained from such methods may be used for preliminary evaluation of the problem only.

6. Attention was drawn to namer interpretation of the test results.

7. Finally the fact that prevalent methods of ascertaining possible liquefaction employ (i) vibration table studies (ii) cyclic triaxial shear and (iii) pure shear tests and the end results vary to a large degree, was highlighted. There is a need to establish finally the correlations between each type of result obtained.

The ques tion of liquefaction of soils was discussed in several other sessions too. Therefore, it may be appropriate to choose "liquefaction" As a theme for one of the main sessions for the next International Conference.

8. A technique of "Holography" for study of Horizontal and vertical displacements of soils and soil bases during vibration was described. This holds promise for further studies in soil dynamics.

A general feeling during the session was that "Soil Dynamics" has made considerable progress. nurek dam which is 300 m high has been taken up. Seismic stability of such a high earth and rockfill dam pose a stimulating challenge to the engineer. Still, more research need go into this topic to obtain better answers.

In the end, I conclude that the discussions were very stimulating, the purpose for which this session had been programmed has been adequately served and the recommendation during this session shall serve as guidelines for future work in "Soil Dynamics". And finally I express my sincere thanks to the Organizing Committee who invited me to chair this session and the excellent arrangements they made for our comfortable stay and visits to place of interest in and around Moscow. The hospitality offered by our hosts cannot be easily forgotten.

Prof.Ralph B.Peck, Past-President of the International Society for Soil Mechanics and Foundation Engineering

This concludes my formal address. I shall now pass quickly to one pleasant remaining duty.

The office of President of this Society has only one symbol of authority: this gavel which I show you now and which has been used for the conduct of meetings of the Executive Committee. Let me read to you the inscription on the box in which it is kept.

"This gavel is made of wood from friction piles in the foundation of 11th Century Church of Santa Maria, Oslo. The piles are of alder and were driven into soft clay. The gavel is designed by the Norwegian artist Arne Lindaas and presented to the International Society of Soil Mechanics and Foundation Engineering by the Norwegian Geotechnical Society at the Paris Conference in the year 1961".

For four years, this gavel has been proudly displayed in my office. It gives me the greatest personal pleasure to present it to our President-elect, Professor Jean Kerisel of France, to whom we look with every confidence for leadership from the end of this conference to the end of the Tokyo Conference four years hence. Professor Kerisel, will you join me at the rostrum to receive my best wishes and this symbol of the presidency.

Prof.J.KERISEL, President of the International Society for Soil Mechanics and Foundation Engineering

Avant que le Prof.Peck ne quitte la presidence de notre Societe, je voudrais lui exprimer tous nos remerciements pour son action

Le Prof.Peck est un des derniers grands heritiers de la pensee de Karl Terzaghi, le fondateur de notre Scoete. Je ne rappellerai pas (parce que vous les connaissez) la variete des problemes sur lesquels il est intervenu, ni tous les livres et articles qu'il a publies, pas plus que les nombreuses distinctions honorifiques qui lui ont ete ettribuees mais je voudrais dire que sa vaste culture scientifique lui a permis de faire, au cours de nos congres, des syntheses brillantes qui nous ont ete tres precieuses.

Sa modestie et sa simplicite nous sont connues et, personnellement, j'ai pu apprecier plus particulierement, sa patience et son autorite, au cours de notre discussion au comite executif lorsque nous etions a la recherche d'un budget plus important en rapport avec le developpement de notre Societe mais conçu de façon a ce que son poids reste supportable pour les moins grands pays. Sous sa Presidence, le nombre des participants au congres international a depasse 2000. Qu'il soit remercie sincerement de son action tres positive a la tete de notre Societe.

Messieurs et Mesdames, je ressens profondement l'honneur qui m'est fait, ainsi qu'a mon pays, par cette designation a la tete d'une Societe internationale, deja ancienne de pres de 40 ans et forte de 50 pays et 10000 membres. Je suis conscient qu'a travers des merites bien inferieurs a ceux d'un grand nombre de mes collegues, vous avez voulu honorer quelques pionniers de mon pays qui ont ete a l'origine du developpement de notre discipline. Ainsi interpretee, cette distinction ne m'en est que plus precieuse.

Je sais aussi que le caractere de mon electron, apres vote de tous les pays membres, en application de nos nouveaux status votes a Mexico, me cree un double devoir, celui de bien servir la Societe et, d'autre part, d'etre particulierement attentif a toutes vos suggestions, au cours du nouveau developpement que connaitra notre Societe, jusqu'au congres de Tokyo.

De grandes Societes internationales comme les notres, en voie de developpement, appellent necessairement des retouches, specialement dans l'expression de leurs manifestations. Les contacts personnels qu'ils permettent ont une valeur considerable, mais avec un nombre encore plus grand de participants, il faut pouvoir obtenir que les opinons les plus variees, puissent s'exprimer et ceci sans prolonger la duree du congres. C'est la un probleme tres difficile qu'il va nous falloir essayer de resoudre.

Des ce soir, nous commençons a echanger des vues sur le congres de Tokyo et si certaines Societes nationales ont des suggestions a presenter, je leur demande de nous les faire connaitre dans un delai assez bref, en tenant informes leurs vice-presidents.

Mais je leur demande cependant, auparavant, de relire le travail considerable presente par le sous-comite, preside par le Dr.Mac Donald, sur l'organisation des conferences.

Malgre toute ma bonne volonte, ma tache aurait ete trop difficile, si notre secretaire general, le Prof.Nash, n'avait accepte de continuer a assumer le secretariat permanent, j'ai pour lui une grande sympathie personnelle et je sais le travail considerable qu'il accomplit, avec une conscience et une diplomatie inegalable. Qu'il soit remercie d'accepter de nous assurer son concours pen dant ces nouvelles quatre annees.

Le President Peck a deja remercie le comite d'organisation et je n'ai pas besoin de dire combien je m'associe de tout coeur a ses remerciements. Pour moi, parlant deja du passe, je dirai que Moscou restera un souvenir tres precieux dans la vie de notre Societe. Et regardant vers l'Est, je souhaite bonne chance a nos collegues japonais, pour l'organisation de leur congres, en vous souhaitant a tous d'etre presents a Tokyo a ce rendez-vous dans quatre ans.

Prof.N.A.Tsytovich, President of the USSR National Society for Soil Mechanics and Foundation Engineering, Vice-Chairman of the Organizing Committee

Mr.President, Ladies and Gentlemen, Colleagues!

Allow me, on behalf of the USSR National

Society for Soil Mechanics and Foundation Engineering, to thank all those present at this Conference for their active participation.

I particularly want to mention the work of the Chairmen of the Main and Specialty Sessions who did much to facilitate the success of the Conference and for which I wish to express our sincerest gratitude.

I should also like to draw your attention to the tremendous work done by the secretariat of our National Society and the personnel of the Organizing Committee in organizing and conducting this Conference, and the great help rendered by the staff of the Gersevanov Research Institute of Bases and Underground Structures of GOSSTROY USSR.

Allow me also to express our thanks to the employees of this hall for their efficient service during the Conference.

The active participation of a great number of delegates (about 290 speakers were registered) and the well-coordinated work of the Sessions will undoubtedly serve to facilitate scientific and business contacts between specialists in the field of soil mechanics and foundation engineering from various countries.

Allow me to wish all the participants of the VIII International Conference on Soil Mechanics and Foundation Engineering the best of health and great success in their work for the welfare of our peoples.

Prof.R.PECK,

The moment has almost arrived to close the 8th International Conference. It has been an unforgettable experience. Like every conference it will be remembered for some things that went wrong, but, like all good conferences, the spirit of fellowship and accomplishment has grown day by day. Who will forget this magnificent hall, the meetings and the delightful concerts and dances? Who will forget the warmth of our hosts, or the glimpses we have seen of the heritage and accomplishments of their country?

We cannot thank personally every person who helped in the organization of this Conference, although we wish we could. The Organizing Committee, under the chairmanship of Dr.Ganitchev and the co-chairmanship of Professor Tsytovich and Mr.Fedorov, with the able help of Secretary-General Chetyrkin, deserve our special thanks for their long and successful efforts. The many people in charge of arrangements for the sessions, technical visits and tours; the translators and interpreters; the editors of the Conference Proceedings-all these and many more deserve our gratitude. They have done a tremendous job, and the success of the conference testifies to their efforts.

While the technically-minded members have attended the meetings, our ladies and guests were entertained delightfully. To speak for them, I have asked Mrs.Nash to come to the podium so that you may hear their impressions at first hand.

Mrs.Nash

Ladies and Gentlemen,
I am delighted to have been given this opportunity of saying thank you - on behalf of all the ladies present - to our Russian hostesses on the Ladies Committee.

We know how much of your precious time you have given us since we came and can guess how much more time was given to making arrangements before we arrived.

You have given us a wonderful welcome and shown us sights that we shall never forget. It is hard to single out one experience from among so many, but personally I shall never forget the beauty of the many buildings in the Kremlin and the sight of Red Square flood-lit at night.

As well as the sights we have seen, though we are so glad to have spoken to so many of you individually and to feel that we have personal friends in Moscow. Thank you.

Prof. R.Peck (continued)

To our hosts one and all, whether your part in preparing for this Conference was large or small, we express our deepest thanks for a memorable, outstanding Conference that has not only broadened us technically but has added mightily to the friendships that are the greatest hope for a peaceful world.

Prof.I.A.GANICHEV, Chairman of the Organizing Committee, Vice-Chairman of the GOSSTROY USSR

Ladies and Gentlemen, Comrades and Friends!

The VIII International Conference on Soil Mechanics and Foundation Engineering has concluded its Sessions.

The Chairmen of the Main and Specialty Sessions have summed up the work of their respective Sessions here. It is evident from their reports that a huge amount of work has been accomplished during the last week.

More than persons spoke at the Main and Specialty Sessions, took part in the discussions and gave their suggestions. This indicates that those present actively participated in the Sessions, and that the problems being discussed are timely and urgent.

About c specialists took part in the technical excursions to building sites, and to research and designing institutions.

Twenty excursions were offered to the guests of the Conference and more than 5490 persons took part in them.

A large group of specialists and guests, more than persons, will participate in the post-Conference tours which will take them to various parts of our country.

We hope that this extensive program has enabled you to get aquainted with our people, with their art and culture, and to take home with you pleasant recollections of the days spent in our country.

Personal contacts between scientists and specialists during this forum and a wide ex-

change of opinions has enabled the participants of this Conference to enrich their knowledge, to make extensive contacts, to exchange experience and to make friends.

We are sure that all this and the creative energy developed during this Conference, will lead to new achievements in science and to further development of soil mechanics and foundation engineering.

It was a great pleasure to hear the words of gratitude addressed by the participants and guests to the Organizing Committee and to those persons, who did their best to facilitate the preparation and the work of this Conference.

We are sincerely grateful to you for your high appraisal of our efforts.

Allow me to wish you a happy journey, every success in your work for the welfare of your country, and much personal happiness.
Good-bye.

REPORT OF THE ORGANIZING COMMITTEE
RAPPORT DU COMITE D'ORGANISATION
ОТЧЕТ ОРГКОМИТЕТА О ПРОВЕДЕННОЙ РАБОТЕ
ПО ПОДГОТОВКЕ К КОНГРЕССУ

REPORT FROM THE ORGANIZING COMMITTEE

1. HISTORY AND ORGANIZATION OF THE CONFERENCE

At its meeting in Mexico City, prior to the VII International Conference on Soil Mechanics and Foundation Engineering, the Executive Committee of the ISSMFE voted to hold its next International Conference in Moscow. At the same time, the Executive Committee appointed an Advisory Committee that would helps to prepare the next Conference. The Advisory Committee consisted of four persons: D.H.MacDonald (Canada), The Chairman Prof. E.H.Davis (Australia), Mr.B.Kjaernsli (Norway) and the Secretary General of the ISSMFE, Prof. J.K.T.L.Nash.

In 1970 the USSR National Committee for Soil Mechanics and Foundation Engineering formed the Organizing Committee of the VIII International Conference, its chairman being Prof. I.A.Ganichev, Vice-Chairman of the USSR State Building Committee (GOSSTROY USSR) and first vice-chairman being Prof.N.A.Tsytovich, President of the USSR National Committee for SMFE. The USSR National Committee began planning the VIII Conference immediately following the Mexican Conference.

It was decided that it would be most convenient to hold the Conference from the 6th to the 11th of August 1973. It was planned to hold the technical sessions at the Moscow State University which has excellently equipped spacious halls. The opening and closing Sessions were to be held in the Palace of Congresses in the Kremlin, which seats 6000 persons.

These decisions were made at the first meeting of the Organizing Committee, and were published in Bulletin No.1.

During his visit to Moscow in 1971 Prof J.K.T.L.Nash, Secretary General of the ISSMFE, saw the places proposed for the Sessions of the Conference and expressed his approval. However, after analysing the data of the tentative participation to the Conference, the Organizing Committee decided that it would be more expedient to hold the Conference, including the opening and closing sessions, closer to the place of residence of the majority of the Conference participants. This measure would substantially reduce the time needed for the main body of the participants to reach the Conference hall, and would eliminate transportation problems, that are inevitable when 2500 persons are involved. Eventually, the Organizing Committee decided that the opening and closing Sessions of the Conference, as well as the Main Sessions and a Specialty Session each day, were to be held at the Central State Concert Hall which is adjacent to the Rossia Hotel and seats 2500 persons. The simultaneous Specialty Session would be held in the cinema hall "Zaryadie", situated in the stylobate of the "Rossia" hotel, where the greater part of the Conference participants were to be accommodated. This information was given in Bulletin No.2

The report made by the Advisory Committee in 1971, containing an analysis of the VII International Conference was studied by the Organizing Committee and, in the main, its recommendations were followed. Close contact was also maintained with Prof. Ralph B.Peck, president of the ISSMFE, and with its Secretary General, Prof.Kevin Nash, whose advice was invaluable, especially on complicated organizational problems.

On the basis of established tradition in organizing such conferences, experience gained in organizing the Mexican Conference, recommendations of the Advisory Committee, the decisions of the Executive Committee and the advice of the President and the Secretary General of the Internation Society the Organizing Committee reached the following principal decisions:

a) To hold four Main Sessions, abandoning as at the VII Conference, any attempt to cover the whole field of soil mechanics, in favour of the most urgent present day problems.

b) To maintain the tradition of holding Specialty Sessions, first held at the VII Conference, and to promote informal discussion of specialized topics by interested persons. The chairmen of these Sessions being responsible for the selection of the written technical reports and of the speakers, if the number of those wishing to participate in the discussion is too great for the time alloted for these discussions. To hold eight Specialty Sessions, two simultaneously after each Main Session.

c) To have special lectures read by eminent specialists before each Main Session; the subject-matter of these lectures being pertinent to new trends and new fields in the development of soil mechanics and foundation engineering techniques.

d) To drop panel discussion at the Main Sessions in favour of discussion by preliminary registration.

e) To ask the General Reporters to compile a State-of the-Art Report mentioning in it the most interesting achievements described in the submitted reports, instead of a both a State-of-the-Art Report and a General

Report (compiled as a review of the presented papers).

f) To publish the Conference Proceedings by means of the photo-offset method, thereby decreasing, as much as possible, the interval of time between the deadline for the submission of papers and their publication. The format of the Proceedings will be the same as that at the previous Conferences.

g) To hold the technical sessions during four days consecutively according to the following plan: 1. Special lecture. 2. Main Session. 3. Two Specialty Sessions (held simultaneously).

To hold the Opening and Closing Sessions of the Conference on the day before the beginning of the technical sessions and the day after their conclusion, respectively.

In June 1972, Mr. N.S. Chetyrkin, Cand.Sc. (Eng.), was elected Secretary General of the Organizing Committee.

2. Languages and Translation

The Conference was conducted in both English and French (the official languages of the ISSMFE) and in Russian. The Bulletins of the Conference and all other information was printed in these three languages.

The Organizing Committee provided simultaneous translation from each of these three languages into the other two during the Main Sessions, as well as the Specialty Sessions. The interpreters were provided with special dictionaries containing specific terminology of soil mechanics and foundation engineering. A great number of the papers and texts of the speaches made at the Conference were translated beforehand and given to the interpreters for simultaneous translation.

3. Bulletins

Bulletin No.1, containing the preliminary program of the Conference and other pertinent information, was mailed to all the National Societies for distribution among their members. A preliminary registration form, printed in English, French and Russian, was attached to each Bulletin. These forms could be filled out in any one of these three languages.

Special Bulletin A, containing detailed information on the Main Sessions and instructions for the preparations of papers to these Sessions, was sent out to all the National Societies in February 1972. A sampleform was attached to each copy of this Bulletin showing how the text and the illustrations of the papers should be arranged in the special offset forms for direct reproduction of the originals prepared by the authors of the papers. A sufficient number of forms was sent to the National Societies for distribution among the authors of papers. On request from authors of papers, the Organizing Committee forwarded additional Special Bulletin A and the needed number of special forms.

Special Bulletin B, presenting a detailed program of the Specialty Sessions and instructions for the submission of written scientific reports and the rules for participating in the discussion, was distributed in June 1972 to all the National Societies.

Bulletin No.2 containing information similar to that in the bulletins of previous conferences, was mailed to all those who had returned preliminary registration forms and to all the National Societies in January and February 1973. A final registration form was attached to each copy of this Bulletin. All the Bulletins were forwarded by airmail.

Upon registration in Moscow, the Conference participants were given pamphlets containing a detailed schedule of the Conference. a Memorandum for Speakers, Conclusions, Recommendations and Topics for Discussion, study tours in Moscow, excursions around Moscow, a list of the Conference participants, etc. Accompanying persons were given gayly coloured special programs.

4. Proceedings

The Organizing Committee decided to publish the Conference Proceedings in four volumes. The first two volumes contain the papers submitted to the Main Sessions. The third volume has the General Reports and the fourth volume the material of the Specialty Sessions, the discussion at the Main and Specialty Sessions, the Special lectures, the minutes of the Executive Committee Meetings and the Report of the Organizing Committee.

Summaries of papers, selected by the National Societies, were to be forwarded to the Organizing Committee not later than December 31, 1971. The deadline for submitting the papers was set for May 31, 1972.

Unfortunately, many National Societies did not meet the required deadline and sent in their papers in September, and even as late as October 1972. Naturally, this led to a delay in handing the material of the first two volumes over to the printers, and the compilation of the reviews of the submitted papers by the General Reporters. As a result, one of the General Reports was received by the Organizing Committee only in April, 1973. i.e. only three months before the Conference was to be held.

The sorrowful news was received in March 1972 of the untimely death of Dr. Laurits Bjerrum, Past-President of the ISSMFE, Director of the Norwegian Geotechnical Institute, General Reporter of the VIII International Conference, talented scientist and organizer.

His broad outlook great knowledge and exceptional perseverance won Dr. Bjerrum worldwide fame and respect. Until the very day of his death, Dr. Bjerrum continued strenuous scientific work, participated in numerous international scientific meetings, lectured and made reports. In preparing the General Report for the VIII Conference Dr. Bjerrum carried out the tremendous task of analyzing the papers submitted to the Conference and of evaluating the state-of-the-art of foundation engineering. His General Report was received by the Organizing Committee several days after the sad news of his sudden death. The Organizing Committee was deeply grieved over our common loss.

The first two volumes of the Proceedings contain 208 papers. Instructions for the pre-

paration of the text,tables and figures, the same as those for the VII Conference (the reproduction was done in both cases by the photo-offset method), were given in Special Bulletin A. Unfortunately not all the authors fully complied with the requirements of the instructions especially in the case of illustrations and photographs.

The first two volumes and the volume containing the General Reports comprise about 200 signatures (each signature consisting of 40 000 typographical units including spaces). The distribution of papers among the National Societies, as well as the previously established quotas, are shown in Table I.

It was first planned by the Organizing Committee to distribute the first three volumes of the Proceedings three months prior to the Conference. However,due to the delay in printing the volume with the General Reports, it was decided that the first three volumes of the Proceedings would be given to the participants when they register. Another reason why the Organizing Committee was obliged to make this decision was because the majority of the participants transferred their registration fees as late as June and July 1973, i.e.when it was too late to send the Proceedings to most of the countries by surface mail.

In all 3500 copies of the Proceedings were issued. About 2300 copies were distributed during the Conference. After the Conference the Proceedings could be obtained through v/o "Mezhdunarodnaya Kniga", Smolenskaya-Sennaya, Moscow, G-200, USSR. As stated in Bulletin No.2,the price for a set of 4 volumes including postal costs for sending the first three volumes and the fourth volume when it is issued is 30 roubles.

5. Participants

Table II presents a list of the participants of the Conference,

6. Executive Committee Meeting

7. Main Sessions

The General Reporters and the Chairmen of the Main Sessions were appointed in 1971. In January 1973, the Organizing Committee invited five eminent specialists to serve as Vice-Chairmen for each Main Session. Thus,the Main Sessions were provided with competent guidance. A wide and intensive correspondence was carried on before the conference between the Organizing Committee and specialists that had submitted papers to the Main Sessions. Close contacts with the General Reporters was considered to be of prime importance. The visit of the Secretary General of the Organizing Committee of the VII International Conference in Mexico, Mr.Luis Ramirez de Arellano to Moscow in 1970 greatly facilitated the preparation of the VIII Conference, particularly in its scientific aspect. The constant help and advice given by Prof.Ralph B.Peck,President of the ISSMFE and by Prof.Kevin Nash, Secretary General of the ISSMFE, proved to be invaluable to the Organizing Committee. Finally, Prof.K.Nash's visits to Moscow in 1971, and directly before the Conference in August 1973 were of great significance and in many ways decisive.

Four Main Sessions were held, one each day from Tuesday to Friday, not counting the Opening and Closing Sessions of the Conference. All the Main Sessions were held in the Central State Concert Hall on the premises of the Rossia Hotel.

Each Main Session was preceded by a Special Lecture read by an eminent scientist in the field of soil mechanics.

These lectures began at 9.00 a.m.and ended at 9:45 a.m., and proved to be one of the most popular and widely attended features of the Conference. This is shown by the registration forms of the participants and by the large audiences in the Conference Hall.

All the Main Sessions began at 10:00 a.m. and ended at 12:30 p.m. Each Session was opened with an introductory speech by the Chairman of the Session. Then an abridged account of the General Report was read by the General Reporter and was followed by comments by Prof.R.B.Peck, President of the ISSMFE or by the Vice-Chairman of the Session. At the Second Main Session the comments were made by the late Prof.Dusan Krsmanovič. It was planned to have the Past-Presidents of the ISSMFE Prof.A.Casagrande and Prof. A.W.Skempton comments on the General Reports, but, to our regret,both of these eminent scientists, for various reasons,could not participate as guests of honour in the work of the VIII Conference. It was also planned to have the third Past-President of the ISSMFE, Prof. Laurits Bjerrum's comment on one of the General Reports and the Organizing Committee had received his consent on this matter. Prof.Bjerrum's sudden untimely death prevented the realization of this plan.

After the comments a lively discussion was led by the Chairman on the topics given in the booklet "Conclusions, Recommendations and Topics for Discussion" of the General Reporters, issued prior to the Conference. Registration for the discussion, as well as the selection of speakers prior to the Session was the duty of the Chairman of the Session. Concluding remarks by the Chairman closed the discussion. As a rule,from 1500 to 2400 participants were present at the Main Sessions.

8. Specialty Sessions

Eight Specialty Sessions were held in the afternoons from 14:30 p.m. to 17:00 p.m. (two simultaneously each day) on the same days as the Main Sessions. These Sessions were held in the following manner: the Chairman made an introductory speach giving a review of the scientific report selected for publication in the Proceedings by the Chairman from those received by the Organizing Committee. Here it should be pointed out that the Chairman of the Session was given the right to select the material of the Session to be published in the Proceedings.

The introductory speach was followed by a short speach by the Vice-Chairman (if he wished to do so), and then a preregistered discussion began. Registration for this discussion as stated in the registration form was carried out beforehand. After the registered discussion (five speakers were given seven minutes each), a free discussion began from the floor. Here the speakers were given five minutes each. These discussions were of great interest to many specialists. The number of persons wishing to take part in the discussions, notwithstanding the fact that the subject-matter was strictly limited, stated in Special Bulletin B, was greater than could be accommodated in the time allotted for the Session. Concluding Remarks by the Chairman closed the Session. One or two Vice-Chairmen and a Secretary assisted the Chairman of each Specialty Session in the organization of the Session and the selection of speakers. These organizers were responsible for the work of the Session. Such practice in the organization of scientific symposia has received numerous high appraisals and should be developed further. A great number of specialists were interested in these Sessions, and sometimes more than 700 persons were present.

In addition to the eight Specialty Sessions announced in the Bulletins and Program of the Conference, a Session was held on "Problems of Centrifugal Simulation in Soil Mechanics". This Session was held in the Research Section of the Hydroproject Institute and was attended by a number of specialists interested in these problems. A report on this Session will be published in this volume.

9. Technical Films

The first technical film shown at the Conference was "Foundation Engineering in the USSR". This film was made especially for the Conference and shown as an illustration to the report read by I.A.Ganichev, President of the Organizing Committee, Vice-Chairman of the State Building Committee (GOSSTROY USSR). A number of technical films from various countries and firms (the USSR, France, etc) were shown in the cinema hall "Zaryadie" where four Specialty Sessions were held. The Soviet films were translated simultaneously into both English and French. Various aspects of soil mechanics and foundation engineering were demonstrated in the films. The Organizing Committee did not restrict the demonstration of technical films related to the subject matter of the conference. Several films were shown twice.

10. Technical Visits

A wide and diverse program of study tours was offered by the Organizing Committee to the participants of the Conference in Moscow. These tours took place on the 7th, 8th, 9th and 10th of August in the afternoon from 15:00 p.m. to not later than 17:00 p.m. i.e. at the same time that the Specialty Sessions were held. After the Main Sessions were held, participants who did not wish to attend the Specialty Sessions held on that afternoon, could go to one of the ten study tours. The program included visits to research and educational institutions concerned with the field of soil mechanics and foundation engineering; two exhibitions, the Ostankino television Tower; a construction site of the Moscow subway; construction sites and new residential districts in Moscow. A booklet describing the study tours was issued in three languages.

During their visit to the Research Institute of Bases and Underground Structures, the participants had the opportunity to become acquainted with research in the field of centrifugal simulation in soil mechanics and to see the centrifuge in action; to visit laboratories where soil properties are investigated and research is carried out on chemical stabilization of soil; to see the Research Building where in testing trays 8x8x8 m in size, experiments are being carried out on large scale models.

The participants also visited two leading design institutes, Foundationproject and Hydroproject, and became acquainted with the design practice for residential, civil and hydrotechnical construction and with the research being conducted there.

Many participants expressed a desire to visit the largest educational institution in the USSR-the Moscow State University named after the Russian scientist, M.V.Lomonosov, and the oldest civil engineering institution the Kuibyshev Civil Engineering Institute.

The Ostankino television tower, 533 metres high, standing on a strata of compressible soils 35 metres thick (sand, loam, clay), whose reinforced concrete ring foundation is sunk only to a depth 4.65 m below the ground level, drew the attention of the Conference participants by its unique structure and the fascinating view of Moscow seen from the observation platform 385 m from the ground.

The construction site of the Moscow subway was visited by three times as many participants as first planned, because there were very many persons wishing to make this visit.

During the visit to a building site of a new residential district of Moscow, the participants were shown a building under construction and the architectural lay out of one of the new residential districts.

II. Exhibitions

Two exhibitions were organized for the participants of the Conference:

a) "Soil Mechanics and Foundation Engineering in the USSR" could be seen in a pavilion at the Division of Construction on the territory of the USSR Economic Achievements Exhibition.

b) Photographs, prospectuses and apparatus of moderate size were presented by firms in the entrance hall of the Central State Concert Hall.

Many participants visited these exhibitions.

A book stall was situated near the entrance to the Central State Concert Hall where book on soil mechanics and foundation engineering, as well as in other fields, were available.

12. Opening and Closing Sessions

The opening ceremonies of the Conference, to which all the participants and accompanying persons were invited, were held on August 6th 1974 in the Central State Concert Hall.

After a short welcome address by I.A.Ganichev, the Chairman of the Organizing Committee, the participants and guests of the Conference were welcomed on behalf of the USSR Council of Ministers by I.T.Novikov, Vice-Chairman of the USSR Council of Ministers, Chairman of the State Building Committee GOSSTROY USSR, and on behalf of the Executive Committee of the Moscow Soviet by V.F.Promyslov, its Chairman. The participants and guests of the Conference were also welcomed by A.P.Vinogradov, Vice-Chairman of the USSR Academy of Sciences, and by Prof.N.A. Tsytovich, Corresponding Member of the USSR Academy of Sciences, President of the USSR National Committee for Soil Mechanics and Foundation Engineering. Prof.Ralph B.Peck, President of the International Society gave an opening address followed by a short report on the schedule of the Conference by N.S.Chetyrkin, Secretary General of the Organizing Committee. After an intermission the participants and guests of the Conference heard a report by I.A.Ganichev on "Achievements in the Field of Soil Mechanics and Foundation Engineering in the USSR".

The Closing Session of the Conference was held on August 11, 1973 in the same hall. After a short addresses by Prof.R.B.Peck and I.A.Ganichev, brief reports on the work of the Main and Specialty Sessions were given by the Chairmen of the Sessions: Prof.L.Šuklje, Prof.E.de Beer, Prof.A.Kezdi, Prof.G.A. Leonards, Prof. S.D.Wilson, Dr.Yu.K.Zaretsky, Prof. V.S.Eristov, Prof.B.B.Broms, Dr.G.P. Tschebotarioff, Prof.N.N.Maslov, Prof.H.Cambefort and Prof.S.Prakash. After these reports Professor Ralph B.Peck gave the Presidential Address and introduced the newly elected President of the International Society, Prof.J.Kerisel, and handed him the presidential gavel . The president-elect, Prof.J.Kerisel,said a few words. On behalf of the ladies and accompanying persons,Mrs. M.Nash thanked the Ladies' Committee for the interesting program and warm hospitality. The Conference was closed by I.A.Ganischev. Chairman of the Organizing Committee, who wished all the participants and guests a good voyage and success in their work.

13. Social Activities

In the afternoon of the Opening Session on August 6, 1973, after the Opening Ceremonies, a concert was given for the participants and guests of the Conference featuring the Pyatnitsky Russian Choir and Dance Group, circus acts ballet, etc. In the evening of that day a welcome reception was held in the Arbat restaurant. A very interesting and varied program was arranged for the ladies,including visits to the USSR Diamond Fund, the Andrei Rublev Museum of Early Russian Art, the Leo Tolstoy Museum, the F.M.Dostoevsky Museum, the Battle of Borodino Panorama, Estate-Museum "Arkhangelskoye" and the Moscow Stud Farm, to the USSR House of Fashion, the Palace of Young Pioneers and Schoolchildren , a Kindergarten, the "Bolshevik"Confectionary Factory, the Tretyakov Art Gallery, the Kremlin and the Kremlin Armoury. There was also a sight-seeing tour around Moscow by bus, and others. A boat trip on the picturesque Moscow-Volga canal, especially arranged for the ladies, was a great success. Many of the participants to the Conference also ment on this fascinating trip that took place on August 7. This extensive and interesting program was planned and carried out by the Ladies' Committee with the assistance of many other Soviet women.

Two bus trips were arranged on the 4th of August for the members of the Executive Committee and persons accompanying them. One of the trips was to the Yasnaya Polyana Estate-Museum of Leo Tolstoy and the other to the ancient Russian towns of Vladimir and Suzdal with their superb 12th- and 13th-century architectural monuments. On the evening of August 10,1973, a second concert was given for those participants and guests of the Conference who for some reason or other did not attend the first concert given on August 6. For the same evening free tickets were available to the Moscow circus. During the Conference a box office where tickets to theatres and concerts could be bought was open in the foyer of the Conference hall. On August 11 a farewell banquet was held in the Arbat restaurant,featuring a floor show.

14. Post-Conference Tours in the USSR

The Organizing Committee, together with Intourist, arranged six technical tours in the USSR. The tours were planned so that the participants would visit construction sites and institutions,as well as historic and cultural monuments of our country. Recreation was also planned. Favourable weather added to the success of there tours. A detailed report of the tours is given in this volume of the Proceedings.

15. Financies.

In addition to the registration fees and the sale of sets of the Proceedings,the Conference was financed by the Soviet Government through the State Building Committee (GOSSTROY USSR). Participants from abroad were accommodated by Intourist,including visas. Hotel accommodation was provided by Intourist and the Executive Committee of the Moscow Soviet. Transportation facilities for the participants were provided by Intourist. The State Concert Hall,where the Conference was held,and the cinema hall "Zaryadie" were provided by the Executive Committee of the Moscow Soviet,while the hall where the Executive Committee Meeting was held was provided by the USSR Union of Societies for Friendship with Peoples of Foreign Lands. Technical services were rendered by assis-

tance groups made up of the personnel of the Gersevanov Research Institute for Bases and Underground Structures and other institutions, and supervised by the Organizing Committee.

16. The Secretariat

The Secretariat of the Organizing Committee began preparing for the Conference in 1969. At that time its staff consisted of two persons. In June 1972, Mr.N.S.Chetyrkin, Cand. Sc.(Eng.), Department Head of the Gersevanov Research Institute for Bases and Underground Structures, was elected Secretary General of the Organizing Committee. At this time staff consisted of 8 persons. During the Conference and just before its opening and after its conclusion,the staff of the Secretariat consisted of 14 persons. They all worked with great enthusiasm and interest, and were concious of the prime importance and responsibility of the work they were doing for the success of the Conference. They were aided during the Conference by a considerable number of interpreters and other supporting staff workers.

Fig.6. Rossia Hotel, where the Organizing Committee of the VIII International Conference for Soil Mechanics and Foundation Engineering was situated and the majority of participants lived

Fig.7. Visit of the Conference participants to the Moscow Kremlin. August 5, 1973, Near the Tsar-bell

REPORT FROM THE TECHNICAL VISITS SUB-COMMITTEE

PROGRAMME OF STUDY TOURS IN MOSCOW

1. Research Institute for Bases and Underground Structures
2. Hydroproject Institute, Research Division
3. Fundamentproject Institute
4. Moscow Civil Engineering Institute
5. Lomonosov State University
6. Exhibition on Soil Mechanics and Foundation Engineering
7. Ostankino television tower
8. A construction site of the Moscow Subway
9. New residential districts of Moscow
10. Exhibition on City Planning and Development in Moscow

These visits took place daily during the Conference for people who were interested in more than one, or wanted to attend the most interesting ones for them.

The number of attendants to the Technical Visits was 2250 persons.

DESCRIPTION OF VISITS

1. RESEARCH INSTITUTE OF BASES AND UNDERGROUND STRUCTURES

The Research Institute of Bases and Underground Structures, GOSSTROY USSR, was founded in 1931 and is the main scientific centre in the USSR for research in problems of foundation engineering, soil mechanics and underground structures.

At present the Institute has fifteen laboratories and a staff of about 700 employees, including eighteen doctors of science and 75 candidates of science. The Institute has branches in Vorkuta, Dushanbe and Kishinev, a laboratory in Nizhnevartovsk, and a proving ground in Zagorsk.

The New Techniques Department with a staff of 180 specialists is engaged in introducing advanced methods and new techniques, developed in the Institute, into regular building practice.

Basic research is being conducted on the following problems:

1. A further development of the theoretical basis for soil and rock mechanics, and the thermophysics and physicochemistry of soils.
2. A further development of methods for the investigation of soils and rock used in foundation construction and underground structures.
3. The improvement of methods for the design and construction of bases and foundations of buildings and structures under various conditions, including those erected on permafrost, subsident, swelling, silty, peaty, saline and other soils, as well as in seismic regions.
4. The development of methods for the design and construction of underground structures under various conditions.

The Institute carries out and coordinates fundamental research and specific investigations in the field of soil mechanics and foundation engineering, works out building practice codes, standards and other documents as well as specifications for machinery and equipment.

The Institute renders the necessary engineering aid to construction, design and survey organizations, develops experimental research methods and trains research personnel.

During the visit to the Institute, the participants will be shown through the laboratories and an exhibition; they will see tests being carried out on the installation for centrifugal simulation and investigations in the chemical stabilization of soils. In the Research Building they will see experiments for investigating the behaviour of pyramidal piles in a homogeneous foundation base, single masts for power transmission lines and the stress-strained state of bases for foundations with mushroom anchor footings.

The visitors will also see installations for studying the behaviour of rigid and yielding systems of foundations for mined-out (subsidence) sites, as well as those for investigating the interaction between tunneling shields and soils.

The tour through the Institute takes about an hour and a half. The bus trip from the Rossia Hotel takes 40 minutes.

2. HYDROPROJEKT DESIGN AND RESEARCH INSTITUTE

The Hydroproject Institute was founded in 1932 and is engaged in surveys, design and research in the field of hydroelectric power plant construction. More than 170 hydroelectric power plants have been built to projects designed in this Institute. These include the Krasnoyarsk and Bratsk power stations, which are among the largest in the world.

The Institute designed the Volkhov (1925) and Svirsk (1934) and other hydroelectric power plants that were the first in world practice to be erected on clayey soils. In subsequent years a number of power stations were built on the Volga river on alluvial sandy or clay soils to projects of the Institute.

All design and research in soil mechanics, conducted in recent years by Hydroprojekt, are connected with the construction of high earth dams in the USSR, such as the Nurek dam, 310 metres high, Rogun dam, 320 metres high, Charvak dam, 168 metres high and other similar structures erected in the mountainous regions of Central Asia.

Research work is being carried out on the following problems:

1. The study of strength and deformation properties of coarse rock-debris materials for the retaining fills of dams.
2. The study of the percolation and physico-mechanical properties of soils used for the cores of dams.

3. Theoretical and experimental investigations of the stressed state and crack formation in the cores of dams and of the stability of slopes.

To conduct this research the laboratories are provided with large-sized triaxial compression apparatus, oedometers, filtration facilities for investigating various soils used in the construction of high dams, and test stands for studying the stressed state and stability of dams on models.

The participants will see projects of dams, the results of research work and laboratory installations used for studying soils. The tour through the Institute takes about an hour and a half. The bus trip from the Rossia Hotel takes 50 minutes.

3. FUNDAMENTPROJEKT INSTITUTE

The Fundamentprojekt Institute is one of the leading institutes in the USSR for designing complex bases and foundations. It is also engaged in geological engineering surveys and the investigations of soil properties for construction.

During the visit to the Institute, the participants will see diagrams and wall sheets illustrating work that has been done on:

1. The designs of foundations for high structures in seismic regions.
2. Designs of pile foundations and methods of sinking prefabricated caissons.
3. Typical design, and in working out USSR Standards (GOST) and codes for foundation engineering.
4. The application of geophysical methods in prospecting for gas pipelines under permafrost conditions.
5. Various methods of determining the bearing capacity of piles in the field.
6. Methods of determining the shear strength of soils in the field by means of a large-diameter ring, and in the laboratory in a semiautomatic device.

The tour through the Institute takes about an hour and a half.

The bus trip from the Rossia Hotel takes 30 minutes.

4. THE MOSCOW CIVIL ENGINEERING INSTITUTE

The Kuibyshev Civil Engineering Institute (MISI) is the largest Soviet educational institution for training civil engineers for almost all branches of the construction industry and allied fields.

The Institute was founded in 1921. During the last fifty years about 30000 engineers have graduated from it.

The Institute has a staff of instruction and research consisting of 825 members, including 80 professors and 274 assistant professors Of the faculty 77 members are doctors of science and 445 are candidates of science.

The Institute offers day and evening courses.

The day course has nine department:

Industrial and civil construction
Hydrotechnical construction
City planning
Construction technology
Heat, gas and ventilation engineering
Water supply and sewerage
Mechanical engineering
Thermal power plant construction
Automatic control systems for construction

The day and evening courses of the Institute train engineers of thirteen branches and 27 specialities.

During the visit to the Institute the participants will have the opportunity to see the work and research being done by the Soil Mechanics and Foundation Engineering Department. This department has one educational and four research laboratories, and two special research groups.

This department is headed by Prof. N.A.Tsytovich, Corresponding Member of the USSR Academy of Sciences, Dr.Sc.(Eng.)

The tour through the Institute takes about an hour and a half. The bus trip from the Rossia Hotel takes 30 mintes.

5. LOMONOSOV STATE UNIVERSITY

The State University in Moscow was founded in 1755 by the Russian scientist, M.V.Lomonosov, whose name it bears.

The construction of the new University buildings was begun in 1948 on the Lenin Hills and was completed in 1953.

The central building of the University is 240 meters high and is one of the unique buildings of Moscow.

The University complex on the Lenin Hills includes 27 main and 10 auxiliary buildings which house over one thousand educational and research laboratories, 148 large lecture rooms, an assembly hall seating 1500, a club with a hall seating 800, a main library containing 1,5 million books, reading halls, 5754 residential rooms for students and 184 flats for the faculty.

The Moscow University has sixteen departments with 257 chairs. There are over 35 thousand students and postgraduates of more than 70 nationalities.

The instruction and research staff consists fo about 5000 professors, instructors and research workers including 47 Full Members and 59 Corresponding Members of the USSR Academy of Sciences, 720 Doctors of Science and 2400 Candidates of Science.

During the tour through the University the participants will visit the Museum of the Earth and the laboratories of the Chair of soil science and geological engineering. They will see the main assembly hall, lecture rooms and the gym hall with the swimming pool.

The tour through the Institute takes about an hour and a half. The bus trip from the Rossia Hotel takes 40 minutes.

6. EXHIBITION ON SOIL MECHANICS AND FOUNDATION ENGINEERING

An exhibition on soil mechanics and foundation engineering is open on the territory of the permanent National Economic Exhibition.

Achievements in the field of soil mechanics and foundation engineering in industrial, residential, transport and agricultural construction in the USSR during the last five

years are shown here.

The Exhibition comprises the following sections:

1. Methods of investigating the physico-mechanical properties of foundation base soils.
2. Foundations on natural bases.
3. Pile foundations.
4. Construction on subsident and swelling soils.

On display are full-scale equipment and operative models, mock-ups and stands.

The tour through the Exhibition takes about an hour and a half.

The bus trip from the Rossia Hotel takes 20 minutes.

7. OSTANKINO TELEVISION TOWER

The Moscow television tower is the highest freestanding structure in the world. Its total height is 533 meters (1748.7feet). The lower part of the tower, from the ground level up to a height of 385 metres (1263 feet) is made of monolithic prestressed reinforced concrete. The part, to the height of 553 metres was erected by using steel pipe of various diameters. The total weight of the tower and foundation is about 55 thousand metric tons.

The television tower has a ring foundation with an outside diameter of 74 metres (243 feet) and a thickness of 9.5 metres (31.2 feet). The depth of the foundation below the ground level is 3.5 metres (11.5 feet), the mean pressure on the foundation soil being 2.74 kg/cm^2 (37 psi). The maximum edge pressure under a wind load may reach 3.4 kg/cm^2 (48.4 psi). The foundation base consists of compressible soils (sand, loam and clays), extending to the depth of 35 metres (115 feet), which are underlaid by incompressible rock. During the visit to the television tower, the participants will be able to obtain more detailed information on the foundation of this unique structure. They will go by high-speed lifts to the observation platform, where they can see a fascinating birds-eye view of Moscow.

The tour to the television tower takes about an hour. The bus trip from the Rossia Hotel takes 40 minutes.

8. A CONSTRUCTION SITE OF THE MOSCOW SUBWAY

The Moscow Metro (Subway) is rightfully considered to be one of the best in the world. Daily its beautiful and convenient stations admit millions of Moscovites and guests of the capital.

The network of lines of the Moscow Metro, this highly convenient type of urban transport, has 96 stations and a total length of 156 km (97 miles).

In the current five-year period, according to the General Plan for the Reconstruction of Moscow, the Metro will be further developed. By 1975 about 17 km of new lines will be built and the total number of stations will reach 104.

The participants will visit a construction site of the Krasnaya Pressnya radius. The tour takes one hour. The bus trip from the Rossia Hotel takes 40 minutes.

9. NEW RESIDENTIAL DISTRICTS OF MOSCOW

Ancient and ever youthful Moscow is rapidly growing. New residential districts are being built, one after another. In this development, new architectural and engineering solutions are being applied as well as up-to-date methods of planning and construction. Improved types of living houses and cultural buildings are being erected; the most rational forms of construction management are being used.

The participants will visit two or three new residential districts of Moscow.

The districts of North Chertanovo and Orekhovo-Borisovo are being built up with large-panel 9,12 and 16 storey residential houses and steel frame-type buildings with 21 to 25 storeys. Piles of various length are used for the foundations. The participants will see mass-scale construction in the erection of pile foundations.

Another new residential district, Davydkovo, presents an interesting coordination of the architectural design and layout with the existing terrain. Large-panel multistoreyed buildings of various heights are being expediently placed in picturesque surroundings. A fruit orchard has been planted within the district and a wide strip of trees screens the noise of the nearly highway. The inhabitants will be provided with all the amenities of a large modern city. A large shopping centre includes a supermarket, household goods shop and other services.

The whole tour takes three hours.

Participants depart from the Rossia Hotel by bus.

10. EXHIBITION ON CITY PLANNING AND DEVELOPMENT IN MOSCOW

Moscow is the largest city of the Soviet Union. It is a large political and industrial centre, a centre of the sciences, fine arts and culture.

Among the ancient capitals of the world, founded thousands of years ago, Moscow is one of the youngest, it is a little over 800 years old. The rhythm of modern Moscow life is determined by the large scale of construction and creative work of its inhabitants.

Since the Revolution in 1917, the population has increased 3.5 fold; the territory, fivefold and housing resources, eightfold.

The exhibition on city planning shows the present and future architecture of Moscow. On display are the basic scheme for the general layout of future Moscow, perspective views and mock-ups of designs for the central squares and main thoroughfares of the capital and its new residential districts. Much interesting data can be found at the exhibition on the construction of Moscow.

The tour through the Exhibition takes an hour. The bus trip from the Rossia hotel takes 30 minutes.

REPORT OF THE SUB-COMMITTEE ON POST-CONFERENCE STUDY TOURS IN THE USSR

After the VIII International Conference on Soil mechanics and foundation engineering held in Moscow several study tours for participants and accompanying persons were arranged to different cities of the Soviet Union. The aim of the tours was to give an opportunity to see numerous historical, cultural and architectural monuments as well as to visit the most interesting technical objects.

Tour No.1-Leningrad and environs
Tour No.2-Sochi and environs
Tour No.2A-Sochi (the program of Tour No.2)
Tour No.3-Yerevan and Tbilisi
Tour No.4-Samarkand, Tashkent and Dushanbe. Including the visit to Nurek Hydroelectric Power Station.
Tour No.4A-Samarkand and Dushanbe
Tour No.4B-Dushanbe, Tashkent and Samarkand (The program of Tour No.4)
Tour No.4C-Dushanbe and Samarkand (the program of tour No.4A)
Tour No.5-Kiev and Yalta and the environs of the city of Yalta
Tour No.6-Irkutsk and Bratsk including the visit to the Bratsk Hydroelectric Power Station and the Lake Baikal

The Organizing Committee, in conjunction with Intourist (the USSR Travel Agency) had planned Post-Conference tours for participants and accompanying persons so as to give them an opportunity to see the most interesting cultural objects and to visit the most significant scientific-research institutes and construction institutions located far from Moscow and the largest building sites of the Soviet Union.

Tour No.1- Leningrad

On August, 12, Sunday, at 10.30 a.m. the group of 98 specialists departed from Moscow to Leningrad. In the afternoon the whole group went sightseeing around the city of Leningrad. The foreign guests enjoyed seeing architectural ensembles and city monuments.

On August 13, Monday morning, the group of specialists visited the Leningrad General Department of Construction ("Glavleningradstroy") where there was held a talk about the methods of foundation engineering of residential and public buildings on weak soils. After the talk the group visited some projects being under construction in the new estate of Leningrad-Kuptchino.

The specialists saw such projects as the Hotel "Rossia", twenty-two-storey residential buildings on Victory Square, the building-site of the universal palace of sports for 2.500 spectators. The structure is a large roofed sport arena of a round shape in plan surrounded by service premises. The main gymnasium is 160 meters in diameter. The roof of the hall is designed as a sagging membrane sustained by 56 steel columns. The foundation of the columns is made of sectional tubular hollow piles.

At the same time the second part of the group (accompanying persons) made an excursion trip to the environs of Leningrad-the town of Pushkin (27 kilometres from Leningrad). There they visited the Catherine (the empress of Russia) palace-museum and walked in the landscape park dating the 18 century. The town was named after Pushkin. the great Russian poet, who had spent his youth years here.

In the afternoon the group visited Petrodvorets (34 km from Leningrad)-a remarkable architectural monument of the 18 century with the palace, wonderful fountains and soulptures.

On Tuesday, August 14, the group of specialists visited the All-Union Scientific Research Institute named after B.E.Vedenejev, one of the main scientific centres and experimental ground in the field of designing, construction and maintenance of hydroelectric power stations, hydro-technical structures, thermal and atomic power stations. Then the group visited laboratories of soil mechanics and engineering geology, bases and foundation of the Leningrad Polytechnic Institute named after M.I.Kalinin and the branch laboratory dealing with soil mechanics and stability of tailing dumps. In the afternoon the group visited the Winter Palace and saw the richest treasures of the Hermitage where more than 2.5 million displays are exhibited in its halls. Among those exhibited there are canvases by Leonardo Da Vinci, Titian, Rembrandt, Rubens, sculptures and articles of applied arts of encient Egypt, Greece and Rome.

On August 15, Wednesday, the last day of staying, the group went to the suburbs of Leningrad-Rasliv-the place connected with the revolutionary activities of V.I.Lenin. On the same day the delegation left for Moscow by flights N 2424 at 17.18 p.m. and N 2422 at 18.13 p.m.

Tours No.2 and No 2A- Sochi

On August 12, Sunday, the group of 65 persons left the "Rossia" Hotel at 9.00 a.m. for the airport Vnukovo. The flight (No1011) was delayed for 4 hours due to bad meteorological conditions in Sochi. So the group arrived in Sochi only at 5 p.m.

On August 13, Monday, the foreign guests were received by the Chairman of the Sochi City Executive Committee who told the present about the perspectives of the Sochi health-resort region development.

After the reception the members of the group made a sightseeing trip around Sochi and Matsesta visiting some sanatoriums of the health-resort.

The group acquainted with the Black Sea coast landslide zone in the Sochi area.

The zone is very complicated from the point of view of engineering geology with a lot of mountain rivers and brooks, spurs of mountains reaching the sea, complex geological medium with tectonic effects, seismicity reaching intensity of 7-8, superfluous humidity, precipitation and the transgressive-abrasive activity of the sea, having intensified during past 25-30 years.

So protect the coast from erosion and to create artificial beaches as well as to strengthen landsliding and collapsible slopes groins and breakwaters are erected along it.

On August 14, Tuesday, the group saw landslides and their effect on buildings and structures in the area of the Ordzhonikidge health-resort and the Health-resort Treatment Institute on mount Bytkhi.

Mount Bytkhi has an oval shape in plan stretching for 4.0x3.5 kms to the North-West South-East, its highest summit being 300 meters high. Among many landslides of mount Bytkhi the largest and most interesting landslide having been investigated since 1953 is located in the region of the Ordzhonikidze health-resort. This complicated three-storey landslide 60 meters deep was surveyed by the group. In the afternoon the excursion was arranged to Mount Big Akhun (663 meters above sea level) with the dinner in the "Akhun" restaurant on the summit of the mountain. After the dinner the group took part in sea trip along the coast getting some additional information about landslide zones of the Black Sea coast and about the work done to protect the sea coast.

On August 15, Wednesday, the excursion to the Dagamisk tea state farm was organized. One of the agriculturists of the state farm told the guests about the culture of the tea-plantations and the development of the state farm. Then there was tea-tasting of local tea from the Samovar and everybody got a souvenir- a pack of high-quality tea grown on the state farm plantations.

On the same day the group visited the Dendrology park where they have more than 1600 kinds of trees and plants, having been brought here from Africa, Australia, Mexico, Brazil, China, Japan and other countries of the world.

In the evening the members of the groups saw the performance of the Soviet circus actors in a recently built modern building of the Sochi circus.

On August, 16, Thursday, the group went on an excursion to the yew and box-tree grove in the region of Khosta, where the visitors got some information about the creation of the forest reserve, its flora and fauna and about the landsliding effect in the area of the grove.

Then the group visited and acquainted with the work of the Lazarevskoye and the Black Sea landslide stations where installations and devices for studying soils and landslide processes were demonstrated. At the end of study-touring the stations the coloured film about landslides was shown.

In the evening a forewell-dinner-party was given.

On August 17, Friday, at 11.00 a.m., the touring group left Sochi for the Adler airport and at 3.30 p.m. (flight No 1018) the participants arrived in Moscow.

Tour No 2A-Sochi

Tour No 2A was arranged at the request of the Japanese delegation, consisting of 30 members. The study-program of scientific-technical excursions for this group fully considered with the program of tour No 2. The group stayed in Sochi from August 13 till August 19. On Sunday the delegation returned to Moscow.

Tour No 3- Yerevan and Tbilisi

On August 12, Sunday, the group of 82 specialists left Moscow at 12.30 p.m. (flight No 893) and arrived in Yerevan at 3.10 p.m. After dinner and accomodation in the hotel the group made a sightseeing trip around the evening Yerevan.

Next day, on Monday, August 13, the foreign guests were received in the Armenian State Building Committee where the members of the delegation were told about perspective plans of construction in the republic. After the reception the group took part in the bus excursion about Yerevan and acquainted with the most interesting buildings and structures:

1) the Youth Palace- a 16-storey structure in the form of a cylindrical tower 27 m. in diameter with the inner core 10.8m in diameter. The building has a hotel for 512 guests, a restaurant for 400 seats, a hall for 1200 spectators, a gymnasium, a covered swimming pool;

2) the Cardiological Institute which is a volume-space composition of 2 high buildings. One is an eleven-storey clinic building and the other is a thirteen-storey laboratory building which are connected by a few-storey service structures;

3) the stadium in the Razdan gorge for 70 thousand spectators very well harmonizing with the gorge relief.

In the afternoon the group visited the building sites of multystorey projects where construction is being done by the liftslab method and saw the buildings with spacial frame precast-monolithic sceleton.

Then the group visited the laboratory investigating strength and creep of materials at the mechanics institute of the Armenian SSR Academy of Sciences. The problems of soil reology such as the definition of physico-mechanical properties of soils under static and dynamic load conditions are solved in this laboratory equipped with modern devices and installations.

Late in the evening there was the tasting of best Armenian wines in the cellar "Maran".

On August 14, Tuesday, the group made a sightseeing excursion around Yerevan. Yerevan was founded more than 2750 years ago by the King of Urartu Grgistis I. The city has a number of monuments of olden times. Among them one can see the oldest in the world depository of ancient manuscipts-Matenadaran numbering 11000 works on history, philosophy, medicine, mathematics, literature and other subjects.

The group viewed ancient architectural monuments the Gekhard Monastery of 12-13 centuries, cut in the rock, the Egeri monument and others. In the afternoon the touring grou visited Echmshadsin- the ancient temple built in 303 year and the Zhvartnots church dating to the 7 century.

On August 15, Wednesday, the group went by bus from Yerevan to Tbilisi along the picturesque mountain highway with a stop at the

Lake Sevan, which is one of the largest mountain lakes, located at about 2000 metres above sea level. Here having dinner in the restaurant "Mshkhan", hanging above emerald like surface of the lake the group could enjoy the view of the beauty of the lake surrounded by high mountains with snow-covered caps. On the way to Tbilisi the group was met by the chairman of the State Building Committee of Georgia.

On August 14, Thursday, in the morning there was held a reception in the Georgian State Building Committee, then during the sightseeing trip around Tbilisi the foregin guests saw the construction of the highway tunnel 900 metres long with through-put capacity of 750 cars per hour and visited the construction of the first line of the Tbilisi metro. Then the group of specialists visited the laboratories of the Georgian hydroelectric power station scientific research institute dealing with the problems of hydro energetics, dam designing, investigation of hydro-technical structures, bases and foundations.

At the same time the group of accompanying persons visited the Georgian Art Museum, the State Georgian museum, the house-museum of artist L.Gudiiashwilly and the studioes of Georgian metal chasers.

On August 16, Friday, the group drove along the Georgian Military, Highway running through Darjal gorge which beauties had been glorified by great Russian poet A.S.Pushkin, and through passes of the Caucasian mountains. During the trip the touring group saw the ancient capital of Georgia (Mtskheta and Dzhavary) the Ananury fortress (12 century) and then ascented the Cross top (2388 meters above sea level).

The tour program ended with supper in the national night club.

On August 18, Saturday, after a sightseeing trip about Tbilisi the group of foreign specialists left for Moscow at 8.30 p.m.(flight No 932).

Tours No 4,4A,4B,4C-Samarkand, Dushanbe and Tashkent

To meet the desire of the participants of the Conference to take part in tour No 4(the number of people wishing to take part in Tour No 4 was the largest) 4 groups were organized- two of them having a complete program (tours No 4 and No 4B) and the other two having a shorter program (No 4A and No 4c) excluding Tashkent.

All the four groups left Moscow on August 12 and returned to Moscow on August 17, Monday- tours No 4A and No 4C- and the groups of tours No 4 and No 4B arrived in Moscow on August 18.

50 people took part in tour No 4, 30-in tour No 4A, 50-in tour No 4B and 50- in tour No 4C. The tour programs differed very slightly. The description of the main visits is given below.

Samarkand. Among all cities of the world it is one of the most ancient one. It is 2.500 years old. The city had been captured by warriors of Alexander of Makedonia, the troup of the Arabian caliph, Mongolian hordes of Chingis khan.

At present Samarkand is the place of pilgrimage for thousands of tourists from all over the world. Here one is delighted to see old buildings of the ancient city.

For all groups arriving in Samarkand two-days excursions were arranged with the sightseeing program of the most significant places of interest in this city such as the ensemble of Shakhizinda (XIV-XVIcc), the Mosque of Bibi-khanum (XIVc), the Gour-Emir mausoleum (XVc), Registan Medress Ulugbek (XVc) and Medress Shir-dor (XVIIc) squares, the Ulugbek Observatory (XIc) and many other ancient Asia's architectural monuments.

Tashkent. The program of staying in Tashkent- the capital of the Uzbek SSR- included the sightseeing excursions around the city, having become more beautiful after the disastrous earthquake of 1966, the visit to the Scientific Research Institute of raising the Astrakhan strain of sheep, the silk-weaving factory, the museum of the city existence, the museums of the Uzbekistan's cultural history and applied arts. At the Exhibition of Economic Achievements the guests acquainted with the work and life of the republic.

The groups of specialists visited the Tashkentgiprogor institute dealing with designing dwellings and industrial buildings on subsident soils and in seismic regions and saw the documentary film-"Tashkent. Earthquake"

During the leisure time the participants of the tour acquainted with cultural life of the city, had an opportunity to tast wines and dishes of the Eastern Kitchen in national restaurants.

Dushanbe. In Dushanbe, the capital of the Tajik SSR, the group toured the city, visited some building sites getting acquainted with some methods of foundation construction, made a trip to the Varzobsk gorge, visited the Exhibition of Economic Achievements. Then the group visisted the construction of the Nurek Hydroelectric Power Station with the world's highest rockfill dam 300 meters high and 5 million cubic meters in volume. The power station is being erected in the mountain region on the river Vakh , its designed capacity being 2.7 million kilowatts.

Tour No 5- Kiev and Yalta

On August 12, Sunday, the group of 34 members left Moscow for Kiev at 12.50 p.m.(flight No 1777). Upon arrival the group made a sightseeing bus trip around Kiev, in the evening the participants visited the Palace of Culture "Ukraine" and saw a concert of falk companies of the Ukraine.

On August 13, Monday, the group visited the State Building Committee of the Ukrainian SSR where they got some information about the city development. After that the group saw new buildings and acquainted with some methods of foundation construction.

In new estates being under construction-Rusanovka and Darnitsa- 9-16 storey houses of large panels, blocks and brick are erected.

The foundation is made of pre-cast and monolithic reinforced concrete units on plots with clayey and sandy soils. In the areas of compressible and subsident loessy soils buildings are constructed on a filling reinforced concrete pile foundation.

In the afternoon the group saw some architectural monuments such as the Sophia reservation (XIc), the Kiev-Petchora monastery (XVI–XVIIcc), the Akreyev Church (XVIIIc), the Vladimir Cathedral (XIXc) and others.

On Tuesday, August 14, the group visited the Scientific Research Institute of structural elements including the laboratories dealing with soil mechanics, foundation engineering, field methods of determining physico-mechanical properties of soils.

The members of the group acquainted with the work in the field of simulation of strain processes and stress distribution characteristics in different building structures and were told about stabilization methods of subsident soil by means of underwater explosions worked out by the institute. Then the group visited the Exhibition of Economic Achievements where the members of the group saw the building materials produced in the Ukrainian republic, different types of structures, sample-flats of an improved lay out.

In the evening the whole group made a trip along the river Dneper.

Early in the morning, on August 15, Tuesday the group departed from Borispol airport at 10.18 a.m. (flight N 203) for Simferopol and then went along the beautiful highway running through mountains to Yalta-a sea resort of the Southern coast of the Crimea.

In the afternoon the group went sightseeing around Yalta and then had a rest at the Black Sea Shore.

On August 16, in the morning, the foreign guests were received by the Chairman of the Yalta city Executive Committee, then there was arranged the excursion along the Crimean Southern Sea Coast. While touring the group visited Livadia, where in 1945 there had been held the meeting of the government leaders of the three great powers-the USSR, the USA and Great Britain, the castle "Swallow's nest" the Vorontsov palace-museum, consisting of 150 halls with a rich collection of pictures, sculptures, China ware and furniture of the 19· and the beginning of the 20 centuries. In the afternoon the group had à leisure time and made a trip along the sea shore, getting some information about shore protection work done in the city of Yalta.

On August 17, Friday, the group visited the building site of the multy-storey resort house "Aidonil" and the international pioneer camp "Artek". On the territory of the camp the group saw the construction work of the foundation being made of drilling and filling piles 1020mm in diameter and about 20 meter long.

The group returned to Yalta by sea and after dinner left for Moscow (flight No.1602) and arrived in Moscow at 10.30 p.m.

Tour No,6-Irkutsk and Bratsk

That was the longest route, which began on August 12, Sunday. The group of 36 people left Moscow by flight No 121 and arrived in Irkutsk in the morning on August 13.

After the sightseeing excursion during which the foreign guests saw architectural monuments, visited the automobile exhibition and the park of culture and rest they went to Bratsk by air. They arrived in Bratsk late in the evening. On August 14, Tuesday, the excursion around Bratsk was arranged. It is a young city, built in the taiga by young buiders the average age of the citizens being about 25. The city has sprang up due to the construction of the large Hydroelectric Power station on the river Angara.

The group visited the building-site of the Bratsk aluminium plant where the guests could see precast unit construction starting from a zero cycle. Then the participants visited the Bratsk timber industry plant equipped with up-to-date machinery. The plant produces wood pulp, cardboard and other materials of high quality made of Siberian timber and exported them to many foreign countries.

The most interesting visit was the visit to the world's largest Bratsk Hydroelectric Power Station. The output of its 20 generators is 4.5 million kilowatts and the hight of the dam is 127 meters. This dam and the five-kilometers long embankment opposes the pressure of the gigantic water storage basin 169 mlrd cubic meters in volume and more than 100 meters deep.

The electric power of the Bratsk Hydroelectric power station is used for local industry needs and is transmitted via power transmission lines of high voltage (500 000 v) to industrial centres of Siberia located thousands of miles away.

On August 15, Wednesday, in the morning the group arrived in Irkutsk, founded in 1661, the formar place of exiles in old Russia. At present Irkutsk is a large industrial and cultural centre of Eastern Siberia. There are more than 70 large plants and factories, more than 50 thousand students study at the University and institutes of the city. The Siberian branch of the USSR Academy of sciences is located in this city.

The group visited the Region studies museum, where acquainted with the history and saw household articles of various nationalities of Eastern Siberia such as Evenks, Buryats, Yakuts. Then it visited the Mineralogical Museum of the Irkutsk Polytechnical Institute, containing the richest collection of Eastern Siberia's minerals and saw some documentaries about the Siberian nature.

On August 16, Thursday, the excursion to the Baikal lake was arranged. The Baikal is one of the most ancient lakes in the world being more than 20 million years old. The lake is as vast as the territory of Belgium and Holland, its depth reaching 174 meters. In the lake vicinities there are about 1700 original strains of animals and different kinds of plants.

The group visited the Limnological Institute Museum situated in the mouth of the

Angara and saw the richest collection of samples of flora and fauna of the lake Baikal vicinities .

The group of foreign guests had a walk along the Baikal picturesque bank and tasted pelmeni (Siberian meat dumplings) in the "Baikal" restaurant. Then the group returned to Irkutsk on board the ship "Rocket"

On August 17, Friday (the last day of staying) the participants were received in the Regional Executive Committee where they got some information of the perspectives of the vast Irkutsk Region development and after the final excursion around the city left for Moscow (flight No 122).

REPORT OF THE SUBCOMMITTEE ON THE EXHIBITION OF EQUIPMENT

An exhibition of apparatus from abroad was organized in the lobby of the Central State Concert Hall in the Rossia hotel, where only moderate-sized items could be exhibited, such as posters, stands, prospectuses and small apparatus.

Twelve firms from nine countries participated in the exhibition. The total area taken up by the exhibits was about 150 square metres.

In organizing the exhibition the Sub-Committee set the following aims and problems:

1. To invite firms from many countries to take part in the exhibition, to aquaint the Conference participants with various design solutions in the field of foundation engineering.

2. To aquaint the Conference participants with achievements in the investigation of soil properties, paying especial attention to field techniques and pertinent instrumentation, and also with certain laboratory equipment, used for evaluating the strength and deformative properties of soils in foundation engineering.

These aims were fulfilled.

Posters and prospectuses on foundation engineering were exhibited by the following firms: Geosonda (Italy), Baugrund (German Democratic Republic) and Terrafigo A.B., (Sweden). Fifteen per cent of the exhibition area was taken up by these exponents.

The main part of the exhibition area (about 84%) was occupied by posters, samples and prospectuses on instruments, characterizing the achievements reached in the field of soil mechanics and in the observation of deformations in the bases of structures.

In this section of the exhibition, the following firms exhibited their products:

Geotech. Co. Elmbren (Sweden), Kyowa Electronic Instruments Co. Ltd. (Japan), Gooda (Holland), Telemac (France), Bovac (Switzerland), Geonor (Norway), Engineering Laboratory Equipment Ltd. (England) and the University of Manchester (England).

The firm Geotechnical Abstracts (Federal Republic of Germany) demonstrated various forms for taking into account and registering investigation data, and statistical methods of processing these data.

Many participants and guests of the Conference attended the exhibition.

With the achievements in the field of soil mechanics and foundation engineering reached in the USSR, the Conference participants were aquainted during special excursions to "The Construction Industry" pavilion at the USSR Economic Achievements Exhibition and during technical excursions to the Foundation-project Institute, the Research Institute for Bases and Underground Structures, the Moscow Civil Engineering Institute, the Moscow State University and the Hydroproject Institute.

SYMPOSIUM ON CENTRIFUGAL MODELLING

V.I.Vutsel, Cand.of Techn.Sc.,Department Head, Scientific Research Centre of "Hydroproject" USSR

Symposium on use of centrifugal modelling in the investigations of soil mechanics problems was organized during the International Conference for Soil Mechanics and Foundation Engineering at the request of participants of several countries. It was held at the laboratory premises of the Scientific Research Centre of "Hydroproject" 37 specialists from England, Bulgaria, Denmark, USSR, Chechoslovakia and Japan took part in the Symposium. Prof. G.I.Pokrovsky (USSR)- the founder of the method of centrifugal modelling was also present there.

Centrifugal modelling as a method of laboratory investigations of soil mechanics problems in case of stressed state corresponding to field conditions has recently acquired a wide recognition in our country and abroad. In many countries a number of complex scientific and technical problems which found as yet no adequate theoretical solutions has been studied by this method since early thirties, after Prof.Pokrovsky developed this technique.

Large modern structures intended for various purposes transfer heavy loads to their foundations. Now it is impossible to study, for example, high earth dams with conventional laboratory equipment which cannot induce sufficient stresses in the tested model structure.

During the Symposium representatives of several countries reported of recent researches V.I. Shcherbina, Head of the Laboratory of Centrifugal Modelling (USSR, Scientific Research Centre of "Hydroproject") gave account of the results of investigations of slope stability, cracking in rockfill dam cores /1/ and earth pressure acting on retaining walls. The test installation comprises carrieges with the internal dimensions: 900 mm in length, 400 mm in width and 500mm in height. The maximum acceleration is 322 g. Model slopes were made of sandy and clayey soils, and of sand with bentonite added to it. Models under test were subjected to gradually increasing accelerations and hence to stresses in the embankment body. The studies permitted to examine the nature of displacements of slopes composed of materials with different properties and the pattern of slope failure. The failure of noncohesive soil slopes is found to occur along plane slip surfaces, and that of cohesive soils- along nonplane slip surfaces. Anslysis of deformation of dams and slopes with the upper horizontal surfaces having the same steepnesses showed a great difference in the values of displacements of deep and surface marks. This suggests a conclusion about the necessity to take into account the real stressed state of an earth structure for correct evaluation of its slope stability.

The investigation of earth pressure acting on concrete retaining walls permitted to reveal the effect of the inequality of the backfill sand density over the wall height on the pressure formation. In practice variation of backfill densities is usually due to the difference of conditions and/or techniques of backfill compaction. Tests indicated that the existence of a badly compacted layers in the lower part of the backfill resulted in a considerable (about 50 per cent) increase of lateral pressure in a zone located above this place.

Prof. A.Schofield (England, UMST) told about interesting stability investigation of an embankment on the Thames for flood protection of London. Its soil foundation consists of clays with the laminations of highly permiable gravel and sandy soils, and due to this there exists water back-pressure, considerably affecting the embankment stability. Centrifugal modelling has permitted to design an embankment conforming to the requirements of complex engineer and geological conditions.

A large centrifuge installation was created in the Manchester university for studying the undisturbed clay soil foundations. The maximum weight of the carriage is 3,5t, peripheral speed- 286 km/hr. The installation will soon be used for model investigations, Mr. A.Schofield stated.

N.Ya.Rudnitsky (USSR The Research Institute of Bases and Underground Structures) spoke about the centrifuge study of different structures foundations being under stressed-strain state, including structures transferring cyclical load to the foundation. Modules of deformation of sand foundations at such a load increase 1.5 times, and of clay foundations- from 1,2 to 1.3 times. If this factor is taken into account, it is possible to reject the pile foundations and fully use the bearing capacity of soil. The centrifuge was also applied to studying the deformation of double-layer foundations consisting of, for example, a sandy layer underlain by peat. The data obtained permitted to plot dimensionless diagrams for determination of a probable settlement of a structure.

Prof. M.Mikasa (Japan, Osaka University) in his communication spoke about constructional features of his centrifuge installation used in studies of earth structures. In the process of rotation, carrieges can be turned in such a way that steepness of slopes (for instance in case of dams) increases and the slope fails. During the test a speedy lowering of the upstream water level and checking the stability of the upstream slope of a hydroelectric project dam is possible. The results of slope stability investigations for cohesive and noncohesive soils closely agree with the experimental data obtained in the Scientific Research Centre of "Hydroproject" /1/.

Examples of application of centrifugal modelling for solution of various engineering problems were cited by R.Bassett (England, Cambridge), P.Avgherinos (England Bipride and Partners), Yu.R.Meljushitsky (USSR Ukrniiproject), T.G.Yakovlev (USSR, MIET), N.Cvorsen (Denmark, DEA).

Prof. G.Pokrovsky (USSR) in the concluding communication has indicated with satisfacti-

on that judging from the statements above, the centrifugal modelling method is at present widely used in experimental soil mechanics. The results of similar problems investigation conform with each other fairly well.

The participants were shown a short colour film on centrifugal modelling, obtained by favour of the English collegues.

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