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**BULLETIN OF THE
INTERNATIONAL MATHEMATICAL UNION**

REPORT OF THE EXECUTIVE COMMITTEE
TO THE GENERAL ASSEMBLY

Covering the period April 1, 1954 — April 20, 1955.

Preliminary remarks. This report covers the indicated period, and follows the analogous report up to April 1, 1954 (issued in June 1954, together with the Financial Report for the years 1952-1953). The main event in that period was the meeting of the Second General Assembly at the Hague (August 31st - September 1st, 1954) the record of which has been printed and distributed during the month of October 1954.

A — ORGANIZATIONAL

As has been reported in the Record of the Second General Assembly, applications for membership in the Union have been received and unanimously accepted, from Brazil, Iceland, and Portugal. The Instituto de Alta Cultura, the National Adhering Organization for *Portugal*, has communicated the following list of Members of the National (Portuguese) Committee for Mathematics: Prof. *José Sebastiao e Silva* (Secretary); Prof. *Augusto Peixoto de Queriós*; Prof. *Diogo Pacheco de Amorim*; *José Vicente Gonçalves*.

The Academia Nacional de Ciencias de Lima, the National Adhering Organization of Peru, has been informed (September 17, 1954) of the resolution of the General Assembly to remove the name of *Peru* from the list of voting members of the IMU: no reply yet.

Therefore, the list of voting members on March 31, 1955 is as follows: Argentina (I), Australia (I), Austria (II), Belgium (III), Brazil (I), Canada (II), Cuba (I), Finland (I), Denmark (II), France (IV), Germany (IV), Great Britain (V), Greece (I), Iceland (I), India (III), Israel (II), Italy (IV), Japan (IV), Malaya-Singapore (I), Mexico (I), Netherlands (II), Norway (I), Pakistan (II), Portugal (I), Spain (II), Sweden (II), Switzerland (II), U. S. A. (V), Yugoslavia (II).

Keeping in mind the groups of adherence and the number of unit contributions:

Group	I	II	III	IV	V
Units	1	2	3	5	8

the present membership corresponds to 73 units (or to an income of \$ 4,759.60).

Prior to the General Assembly letters of invitation (July 1, 1954) to join the Union (accompanied by the already published documents) have been sent to the following nations: Brazil, Bulgaria, Chile, China, Colombia, Czechoslovakia, Egypt, Eire, Hungary, Iran, Poland, Portugal, Romania, Turkey, Union of South Africa, U. S. S. R., Uruguay, Venezuela.

The question of enlarging the membership of the IMU has recently been raised by the First Vice-President, *Denjoy*, and has been discussed by the Executive Committee.

All member countries have been invited (November 25, 1954) to send up-to-date lists of their National Committees for Mathematics which may serve as reference lists for postal-ballots.

B — ACTIVITIES OF THE COMMISSIONS

1. World Directory of Mathematicians

A meeting of this Commission, attended by Professor *Stone* (Chairman), *Belgodère*, *Bompiani*, *Hodge*, was held in London, (December 20, 1954) in Mr. *Hutt's* (Butterworths) offices.

Here is a summary of the conclusions reached at the meeting.

1) The Publishers reported that they had obtained complete lists from the following countries:

Australia	France	Italy	Philippines
Austria	Germany	Jamaica	Portugal
Belgium	Gold Coast	Lebanon	Sierra Leone
Bulgaria	Greece	Luxembourg	South Africa
Canada	Hong Kong	Malaya	Sudan
Ceylon	Hungary	Morocco	Sweden
Colombia	Iceland	New Zealand	Thailand
Cuba	India	Nigeria	Tunisia
Dominica	Indonesia	Norway	Turkey
Egypt	Iran	Pakistan	United Kingdom
Eire	Iraq	Paraguay	Yugoslavia
Finland	Israel	Peru	

(Since that date, three further lists have been received from Argentina, Panama, Poland).

2) The Committee decided that as no list has been obtained from the U. S. S. R. we should include the few names we had, even though the information would be incomplete. It was also agreed that the obligations of the Publishers to the International Mathematical Union have been fulfilled.

3) The Publishers had in their office two complete lists of Mathematicians. It was agreed that one of these should be regarded as the master copy, which, though in the possession of the Publishers, was at the disposal of the International Mathematical Union. The other list would be divided into countries, and each section would be sent to an individual in that country for checking.

In the case of Member Nations, lists would be forwarded to a person on the National Committee concerned; for non-member countries Professor *Stone* gave a list of names and addresses to which the cards could be sent.

4) The lists were to be sent out for checking accompanied by letters on the notepaper of the I. M. U., under the signature of Mr. *Hutt* for the Honorary Secretary. Referees were asked to return the cards to the Publishers.

So far, only the Austrian list has been returned, with deletions and suggestions.

5) When the complete Directory has been corrected and returned to the Publishers — it is hoped that this will be within six months — negotiations will be reopened between the Publishers and the International Mathematical Union. It is clearly understood that though either party can act in any way they think fit, there shall be good-will on both sides, and that no action regarding publication will be taken without consultation.

6) A further point for future discussion was the questionnaire to be sent to all those listed in the Directory, requesting date of birth, mailing address and sphere of interest. The form these questionnaires would take and the way in which they would be sent out remains to be decided.

7) Although it was agreed that the Directory is virtually complete the Publishers are still making every effort to obtain the cooperation of the Iron Curtain countries. These efforts will continue.

Following an invitation by the Secretary, the Chairman of the Commission, Professor *Stone*, addressed (February 8, 1955) to the Executive Committee the letter quoted below, sketching the program of the Commission.
"Gentlemen,

The Commission on a World Directory of Mathematicians is at present functioning as a committee to advise Butterworths Publications Ltd. of London, England, concerning technical problems encountered in the preparation and publication of a World Directory. The only program at present contemplated by the Commission is that of continuing to perform this service until Butterworths is able to publish a first edition of the Directory and so long thereafter as Butterworths may desire it.

In connection with this task there may be need for an occasional meeting of the Commission with representatives of the publisher, but in general no more frequently than once a year. Such meetings would most conveniently be held at Butterworths' offices in London. No meeting has been called for the immediate future, and none is planned. However, some funds should be held in reserve to cover the expenses of one meeting in 1955 should that become necessary. The Commission last met in London on December 20, 1954, in order to discuss with the publisher the decision as to what mathematicians should be listed in the Directory. It was agreed that Butterworths would furnish complete lists by country of all names of mathematicians so far gathered, so that suitable persons in each country could be asked to revise the list of the country.

Because of the very large number of names collected — well over twenty five thousand — the Commission took the position that the list should be reduced to include only those mathematicians whose scientific or other contributions to mathematics (as measured for example by publications reported in the reviewing journals) constitute a clear basis for inclusion. At present time these lists by country are being sent out to consultants.

At the meeting of December 20, 1954, Butterworths Publications stated its intention of sending out questionnaires to individuals, seeking information needed for entries in the Directory, just as soon as the revised lists come back from the consultants and have been put together. After discussion, the meeting decided to adhere to the plans previously reported for the kind of information to be published in the first edition.

While Butterworths Publications wishes to assume full responsibility as publisher from now on, various decision concerning the size of the first edition and the nature of the kind of sponsorship sought from the Union must be postponed until the results of the questionnaires are in.

It is the plan to open pre-publication subscription to those receiving questionnaires and to use the orders placed as a guide to the size of the first edition and other matters. The Commission proposes to act as intermediary between the Executive Committee of IMU and Butterworths Publications as these questions come up in a more precise form and need to be settled. It has been made clear to the publishers that further direct financial aid from IMU is not to be expected. However, some kind of insurance against loss may be considered necessary by the publisher when further information is at hand, and the Executive Committee may be asked to examine this possibility."

Respectfully submitted for the Commission
(Signed *Marshall Stone*).

As indicated in that letter, some funds should be held in reserve for a meeting in 1955.

2. Exchange of Mathematicians

A meeting of this Commission was held in Amsterdam, on September 9, 1954, at which a number of mathematicians were invited to meet the members of the Commission. There was a discussion, in which consideration was given to the following three proposals which had been made to the Commission:

1) To make known to mathematicians those opportunities for exchange of mathematicians, both at the younger and at the more advanced stages of their careers, which exist. UNESCO has prepared a handbook (*Study Abroad*) on fellowship in all subjects, but it is too large for convenient use.

It should be simplified and put into a form for mathematicians that they can see the really significant chances there are for them to have a year or other convenient period of study in a foreign country. The UNESCO book is not all conclusive, and new opportunities are constantly arising.

2) To establish regional information centres which should gather and distribute quickly information about persons from other regions who are or will be visiting, in order to make it possible for universities to invite them for short lecture visits.

3) To set up a clearing-house for academic invitations, in order to help institutions desiring mathematicians and the available mathematicians to get together. It often happens that an institution may have funds and the intention to invite a visiting professor without being fixed on any particular person or informed as to who might actually be available at the time in question. A central bureau to which such institutions might write and in which individuals desirous of a year abroad in foreign institutions might register themselves, might help in establishing useful contacts.

It was agreed that the second of these proposals should be recommended to the Executive Committee for early action, beginning with an information service concerning mathematicians visiting Europe or travelling in Europe.

The Chairman of the Commission was asked to make the detailed arrangements with the Secretary of the Union.

A discussion of the first and third proposals brought to light certain difficulties, both of principle and of detail, which would have to be surmounted before they could be put into effect. In connection with the first proposal, it was agreed, as a preliminary measure, to ask the Secretary of the Union to include a reference to *Study Abroad* when publishing news concerning the activities of the Union.

As referred to in the Record of the Second General Assembly the results of the election for this Commission were as follows: *H. Davenport* (chairman) *S. Iyanaga*, *J. R. Kline*, members.

Professor *Kline* declined nomination to the Commission on grounds of ill health. The Commission is therefore reduced to *Bompiani* (ex-officio) *Iyanaga*, *Davenport* (chairman). The Commission plans to co-opt a mathematician from the U. S. and one or two European mathematicians.

3. International Commission on Mathematical Instruction

A meeting of the Executive Board of this Commission was held in Paris on July 2nd, 1954. The meeting was attended by Professor *Châtelet*, (president), *Kurepa* (vice-president), *Behnke* (secretary), *Ascoli* (treasurer), *Beth* of the University of Amsterdam as a link with the Organizing Committee of the International Congress, *Desforge*, General Inspector of Public Education in France, *Cardot*, representative of the "Centre National de Documentation Pédagogique" in France.

The main questions discussed were the following.

- a) Publication of the „Enseignement mathématique“;
- b) Constitution of national subcommittees; these have been already formed in Austria, Canada, Denmark, France, Germany, Israel, Italy, Netherlands, Norway, Sweden, United Kingdom, U. S. A., Yugoslavia;
- c) Participation to the International Congress at Amsterdam; five reports on the rôle of Mathematics and Mathematicians in contemporary life, and nine reports on the teaching of mathematics for the 16 to 21 years of age students have been insured. Contacts have been established with Prof. *Gerretsen* and Dr. *Wansing*;
- d) Exhibit of mathematical text books for the same age period and of graphs showing the organization of mathematical teaching in different countries;
- e) Production of a film on the rôle of Mathematics and Mathematicians in contemporary life (suggested by *Kurepa*);
- f) Meeting of the Commission during the Congress at Amsterdam.

This meeting was held at Amsterdam in two sessions (September 4, 8). Reports on mathematical instruction in Austria, Denmark, France, Germany, Great Britain, Italy, Netherlands, Sweden, U. S. A., were presented.

The rôle of Mathematics and Mathematicians was discussed by *Kurepa*, *Ascoli*, *Darmois* and *Van Dantzig*.

In addition there was a meeting of the Executive Committee of ICMI on September 6, in which *Châtelet* reported on the resolution and elections of the Second General Assembly concerning ICMI and a General Assembly of ICMI on September 8.

The book exhibit, also showing graphs on mathematical instruction in various countries, was inaugurated by *Châtelet* on September 3, 1954 and stimulated an enormous interest among mathematicians attending the Congress.

A further meeting of ICMI's Executive Committee was held in Paris on October 29, 1954. It was attended by: *Andersen* (Denmark), *Ascoli* (Italy), *Behnke* (Germany), *Cardot* (France), *Châtelet* (France), *Desforge* (France), *Dubreil* (France), *Gerretsen* (Netherlands), *Karamata* (Switzerland), *Kurepa* (Yugoslavia), *Mac Lane* (U. S. A.), *Maxwell* (G. B.), *Monjallon* (France); *Hopf* and *Jeffery* were invited but could not attend.

The resolutions taken at the Hague by the General Assembly concerning ICMI were made known to the audience. In accordance with these resolu-

tions the national adhering organizations or the national sub-commissions have been invited to nominate two delegates of their countries.

Up to now, fourteen nations (of the seventeen countries represented at Amsterdam), have named their delegates. A circular letter concerning the election of ICMI's Executive Committee is to be despatched by the Chairman, *Behnke*, in the very near future. It was decided that:

a) The national subcommissions may publish a work in their countries under the title of scientific foundation of mathematics at schools;

b) The inquiry of the last Congress "The rôle of Mathematics and the Mathematician in contemporary life" may be pursued in order to achieve more comprehensive results.

The first session of the Executive Committee is to take place in the summer.

A Colloquium is planned for the fall of 1956, as a contribution to ICMI's work on the scientific foundation of mathematics at schools.

4. Commission on Scientific Publications

The Record of the Second General Assembly indicates that the Commissions on Dissemination of Mathematical Knowledge, on Abstracting and Reviewing, on the Directory of Mathematical Symbols (of which no activities need be reported for the period June-December 1954), have been disbanded and merged in a new Commission on Scientific Publications (as indicated in Resolution No. 7).

The General Assembly elected the following members of this Commission: *E. Hille*, chairman, *B. A. Amira*, *W. Fenchel*, members.

Later (November 18, 1954) *G. Sansone* was coopted as a member, and accepted.

In a letter dated March 4, 1955, *Hille* sent his resignation both as chairman and as a member of this Commission.

No program of this Commission's activities has been received.

A new chairman will be nominated soon.

C — ACTIVITIES AT LARGE

1. International Congress of Mathematicians (1954)

(Abstract from the Report of the Secretary of the Organizing Committee)

1) At the final plenary session of the International Congress of Mathematicians 1950, held in Cambridge, Mass., the Congress accepted the invitation of the delegation from the Netherlands to hold the next Congress in Amsterdam.

Immediately after its return, the Netherlands' delegation reported this decision to the Netherlands Mathematical Society (Het Wiskundig Genootschap). It was obvious that the International Congress of Mathematicians 1954 should be held under the auspices of the "Wiskundig Genootschap", the society which unites all Netherlands' mathematicians and whose 175th anniversary was to be celebrated in 1953.

In October 1950 the Board of the "Wiskundig Genootschap" appointed a small committee with the task to draw up a report on structure and regulations of the Congress.

Following the report of this Committee, the Board of the Mathematical Society established an Organizing Committee and several sub-committees.

12-00

which started their work in 1951. From these sub-committees may be mentioned:

The Executive Committee of the Organizing Committee consisting of the following members: *J. A. Schouten*, President, *H. D. Kloosterman*, Vice-President, *J. F. Koksmá*, Secretary, *F. Loonstra*, 2nd Secretary, *J. Haantjes*, Treasurer.

The Program Committee: *H. D. Kloosterman*, President, *N. G. de Bruijn*, Secretary, *J. G. van der Corput*, *D. van Dantzig*, *H. Freudenthal*, *J. Haantjes*, *A. Heyting*, *J. F. Koksmá*, *J. A. Schouten*, *A. van Wijngaarden*.

The Technical Committee: *A. Heyting*, President, *F. Loonstra*, Secretary, *J. Bijl*, *J. de Groot*, *G. H. A. Grosheide*, *F. Wzn.*, *J. F. Koksmá*, *P. Mullender*, *J. P. van Roijen*, *E. W. J. Rosenberg*, *J. J. Seidel*, *J. van Wijk*;

The Entertainment Committee: *J. J. Seidel*, President, *G. W. Decnop*, *H. J. A. Duparc*, *W. Peremans*, *E. W. J. Rosenberg*.

His Royal Highness, *Prince Bernhard of the Netherlands*, consented to give his Patronage to the Congress.

Moreover, a Committee of Honour including several high authorities was established. A Financial Committee was also formed including several representatives from industrial and commercial circles. Owing to the work of this Committee considerable subsidies from commercial and industrial bodies were granted to the Congress.

As to the Congress funds, they consisted of a) the membership fees (D. Gld. 50.— for regular members and D. Gld. 20.— for associate members), b) a subsidy by the Netherlands Government, c) a subsidy by the Municipality of Amsterdam, d) several grants mainly by commercial and industrial bodies as mentioned above, e) a grant by UNESCO through the intermediary of IMU, exclusively intended as a subvention to the cost of editing the Congress Proceedings.

2) At the end of 1952 it was definitely decided that the Congress would take place in Amsterdam from September 2nd till September 9th, so that the first communication could be prepared. It appeared in the beginning of 1953. The second communication was sent out at the end of 1953. Both communications were sent to Executive Committees of all mathematical societies known to the Organizing Committee; in addition they were sent to the editors of mathematical journals, to the mathematical departments of Universities, to the Senates of Universities and to the Academies of Sciences.

Moreover, the Academies of Sciences, the Universities, the Mathematical Societies and some other Institutions were invited to appoint delegates to the Congress.

In the meantime, the Ministry of Foreign Affairs sent out invitations to foreign Governments to send representatives to the Congress. The Authorities of this Ministry and of other Ministries rendered all possible help to the Organizers of the Congress arising from difficulties concerning visas of the Congressists, etc.

3) The Program Committee, after several sessions, had drawn up a list of mathematicians who might be invited to give the one-hour lectures (about 20) and the half-hour lectures (about 40). The following mathematicians accepted the invitation to give a one-hour lecture: *P. S. Alexandrov*, *K. Borsuk*, *R. Brauer*, *D. van Dantzig*, *J. A. Dieudonné*, *I. M. Gelfand*, *S. Goldstein*, *Harish Chandra*, *B. Jessen*, *A. N. Kolmogorov*, *A. Lichnérowicz*, *J. von Neumann*, *J. Neyman*, *S. M. Nikolskij*, *B. Segre*, *E. Stiefel*, *A. Tarski*, *E. C. Titchmarsh*, *A. Weil*, *K. Yosida*.

It was decided that the Congress should have seven sections, viz.:

- I. Algebra and Theory of Numbers
- II. Analysis
- III. Geometry and Topology
- IV. Probability and Statistics
- V. Mathematical Physics and Applied Mathematics
- VI. Logic and Foundations
- VII. Philosophy, History and Education.

The following mathematicians accepted the invitation to give a half-hour lecture:

Section I: *H. Davenport, P. Erdős, E. Hlawka, N. Jacobson, H. Maasz, A. Néron, D. G. Northcott;*

Section II: *H. A. L. Behnke, F. Bureau, M. L. Cartwright, L. Cesari, K. Chandrasekharan, A. Erdélyi, W. K. Hayman, E. Hille, K. Kodaira, P. J. Myrberg, Chr. Pauc, T. Wazewski;*

Section III: *H. S. M. Coxeter, B. Eckmann, H. Freudenthal, D. Montgomery, J. P. Serre, K. Yano;*

Section IV: *D. Blackwell, J. L. Doob, R. Fortet;*

Section V: *L. Collatz, G. Fichera, M. R. Hestenes, J. Kampé de Fériet, F. Rellich, J. J. Stoker, A. Weinstein;*

Section VI: *P. Lorenzen, A. Mostowski, J. Barkley Rosser;*

Section VII: *C. T. Daltry, K. Piene, D. Kurepa;* (Professor *Kurepa* was invited on behalf of the Executive Committee of ICMI).

More than 500 members gave short lectures on application to the Congress Committee. Photocopies of the abstracts of those lectures were made in the Mathematical Centre and sent to the secretaries of the section committees concerned, who forwarded them to the referees. Most of them could be accepted without further correspondence with the authors.

443 abstracts could be admitted in time and were printed in Volume II of the Proceedings which appeared before the Congress and was handed to the members. Several manuscripts came too late to be printed before the Congress.

4) The Congress had about 1600 regular members and about 500 associate members. The Headquarters were located in the Royal Tropical Institute in which building also a large exposition of mathematical books was held. This exposition was organized on behalf of the Congress Committee by Messrs Swets & Zeitlinger at Amsterdam (Booksellers).

The Conference rooms were situated in the neighbourhood of the Headquarters, whereas opening and closing sessions took place in the "Concertgebouw" of Amsterdam.

5) The Congress was opened on Thursday, September 2nd by the burgomaster of Amsterdam, Mr. *Arn. J. d'Ailly*. On proposal of Professor *O. Veblen*, the President of the former Congress in Cambridge, Mass., Professor *Schouten* was elected President of the Congress. During the opening-session Prof. *Herman Weyl*, President of the Fields Medals Committee, after having given an official address on behalf of the Committee, presented the Fields Medals 1954 to the winners Professor *K. Kodaira* and Professor *J. P. Serre*.

In the same session which was intermitted by two musical interludes by Mrs. *Fania Chapiro*, Professor *Bompiani* gave official communications on behalf of the Executive Committee of the International Mathematical Union, which held its General Assembly on August 31 and September 1st in The Hague.

The representative of the Dutch Government, Mr *H. R. Woltjer*, addressed the Congress. In the afternoon of the same day the first of the one-hour speakers, Professor *John von Neumann* of Princeton, New Jersey, gave an address on "Unsolved problems in Mathematics". In the evening of the opening-day the participants were received in the Rijksmuseum by the Dutch Government and the Municipality of Amsterdam, represented respectively by His Excellency Mr *J. J. Cals*, Minister of Education, and the Burgomaster of Amsterdam Mr *Arn. J. d'Ailly*.

In the following days scientific sessions as well as several social features took place. During the scientific sessions excursions for associate members were organized. For details we refer to the Scientific Program, the Congress Guide and the Proceedings.

In the afternoon of Wednesday, September 8th a score of members of various nationalities, under the guidance of Prof. *J. A. Schouten*, were received by Her Majesty, *Queen Juliana of the Netherlands* at the Royal Palace in Soestdijk.

In the evening the official Congress Banquet took place with 1500 guests in the Wintergardens of the Grand Hotel "Krasnapolsky". The banquet was presided by Prof. *O. Bottema*. At the end of the dinner several speakers addressed the participants.

From the entertainments further may be mentioned in particular: the Concert by the Amsterdam Concertgebouw Orchestra, and the excursion through the Dutch waterlandscape to Avifauna.'

The last of the one-hour speakers, Professor *A. N. Kolmogorov* gave a lecture on "General theories of dynamical systems in classical mechanics" September 9th.

In the same session Professor *Hodge*, on behalf of the delegation of the U. K. proposed that the next Congress should be held in Edinburgh.

This proposal found the approval of the Congress.

There was an address of appreciation from Professor *Hopf*, Zürich, on behalf of all participants, whereas President *Schouten* presented a resolution of thanks to the various authorities, instances, committees and individuals, which had given their help to the Congress Committee.

6) In connection with the Congress although organized independently by the "Wiskundig Genootschap" three symposia took place with the moral and financial aid of UNESCO, ICSU and IMU, viz.

A— a symposium on *Stochastic Processes*
under the care of Professor *D. van Dantzig*,
Honorary President Professor *Maurice Fréchet*

B— a symposium on *Algebraic Geometry*
under the care of Professor *H. D. Kloosterman*,
Honorary President Professor *Francesco Severi*

C— a symposium on *Mathematical Interpretation of Formal Systems*
under the care of Professor *A. Heyting*,
Honorary President Professor *Emile Borel*

For details we refer to the reports which are to be found in the following paragraphs.

7) In Section VII of the Congress there was a close cooperation between Congress and ICMI. In several joint sessions reports and problems of ICMI were discussed; moreover ICMI organized an exposition of didactical works.

8) After the Congress a session took place in the Hague, under the presidency of Professor *Gaston Julia*, which session was dedicated to commemoration of *Henri Poincaré*, who was born 100 years ago.

Although that manifestation was independent from the Congress, the Congress Committee had rendered its help with great pleasure.

2. Colloquia held in 1954

Symposium A. Stochastic Processes

The symposium on Stochastic Processes was held in the beginning of September 1954 in Amsterdam, under the care of Prof. *D. van Dantzig* and with Prof. *R. M. Fréchet* as honorary president.

The program of the symposium was as follows:

Wednesday 1st September 9.15 - 12.00

Opening by *D. van Dantzig*. Address by the Honorary President.

J. L. Doob, Introduction.

P. Levy, Processus semi-markoviens.

Wednesday 1st September 14.00 - 17.00

D. V. Lindley. The estimation of velocity distributions from counts.

R. Fortet, Applications aux processus stochastiques de la théorie des éléments aléatoires généraux.

D. K. Kendall and *G. E. H. Reuter*, Two singular Markov processes.

Saturday 4th September 10.30 - 13.00

E. Hille, Perturbation methods in the study of Kolmogoroff's equations.

A. J. L. Blanc-Lapierre, Sur quelques applications de la théorie des fonctions aléatoires à l'optique.

Combined session of the Congress of Mathematicians, 1954, and Symposium A:

Wednesday 8th September 14.40 - 15.50

D. Blackwell, Controlled random walks

R. Fortet, Lois des grands nombres pour des éléments aléatoires généraux.

Many mathematicians and statisticians were present at the symposium and participated in the discussions.

By the Board of the Wiskundig Genootschap the technical preparations of this symposium were put in the hands of the Organizing Committee of the International Congress of Mathematicians 1954. The organization of the Symposium was made possible by the financial support by UNESCO which was rendered to the Organizers through the intermediary of IMU.

Symposium B. Algebraic Geometry

The symposium on Algebraic Geometry was held during the last week of the International Congress of Mathematicians, September 1954, under the care of Prof. *H. D. Kloosterman* and with Prof. *F. Severi* as honorary president.

The program of the symposium was as follows:

Monday 6th September 15.20 - 17.10

Opening by *H. D. Kloosterman*. Address by the Honorary President.

Picard Varieties, Group Varieties

J. G. Semple, The triangle as a geometric variable.

M. Rosenlicht, Group varieties and differential forms.

F. Severi, Variétés et fonctions quasi-abéliennes.

Tuesday September 7th 10.25 - 11.35

Transcendental and Topological Methods

F. Hirzebruch, Der Satz von Riemann - Roch in faisceau - theoretischer Formulierung; einige Anwendungen und offene Fragen.

Friday September 10th 10.00 - 13.00

Geometry upon an Algebraic Variety

B. L. van der Waerden, The invariant group of divisor classes.

Friday September 10th 16.00 - 18.00

Discussion about the Foundations and Series of Equivalence

W. Gröbner, Die idealtheoretische Grundlegung der algebraischen Geometrie

F. Severi, Problèmes résolus et problèmes nouveaux dans la théorie des séries et des systèmes d'équivalence.

Combined sessions of the Congress for Mathematicians 1954 and Symposium B

Friday 3rd September

A. Néron, Propriétés arithmétiques de certaines familles de courbes algébriques.

J. P. Serre, Cohomologie et géométrie algébrique.

Saturday 4th September

K. Kodaira, Some results in the transcendental theory of algebraic varieties.

Wednesday 8th September

B. Segre, Geometry upon an algebraic variety.

D. G. Northcott, Specialization methods in algebraic geometry.

Friday 10th September 15.00 - 16.00

A. Weil, Abstract versus classical algebraic geometry.

Several mathematicians attended the Colloquium and took part in the discussions.

By the Board of the Wiskundig Genootschap the technical preparations of this Symposium were put in the hands of the Organizing Committee of the International Congress of Mathematicians 1954. The organization of the symposium was made possible by the financial support by UNESCO, which was rendered to the Organizers through the intermediary of IMU.

N. B. In the official program of the symposium also lectures by Prof. *A. Andreotti* and Prof. *J. Igusa* were announced. These gentlemen, however, were not able to come to Amsterdam. On the other hand *A. Weil*, *G. Semple* at the last moment were able to accept the Committee's invitation. Although not announced beforehand in the program, Prof. *Weil's* one-hour lecture on "Abstract algebraic geometry" took place on Friday September 10 from 15.00 till 16.00 o'clock.

Symposium C. Mathematical Interpretation of Systems

The symposium on Mathematical Interpretation of Formal Systems was held at the end of the International Congress of Mathematicians in September 1954, under the care of Prof. *A. Heyting* and with Prof. *E. Borel* as honorary president.

The program of the symposium was as follows:

Thursday 9th September 9.00 - 11.00

Opening by *A. Heyting*. Address by the Honorary President.

Th. Skolem, Peano's axioms and models of arithmetic.

G. Kreisel, Models, translations and interpretations.

Friday September 10th 9.00 - 17.00

A. Robinson, Ordered structures and related concepts.

Hao Wang, On denumerable bases of formal systems.

L. Henkin, The representation theory of cylindric algebras.

J. Lós, Quelques remarques, théorèmes et problèmes sur les classes définissables d'algèbres.

Due to illness Professor Lós was unable to come to the Congress and Symposium. His lecture was read by Professor Mostowski.

Several mathematicians and logicians attended the colloquium and took part in the discussions.

By the Board of the Wiskundig Genootschap the technical preparations of the symposium were put in the hands of the Organizing Committee of the International Congress of Mathematicians 1954. The organization of the symposium was made possible by the financial support by UNESCO, which was rendered to the Organizers through the intermediary of IMU.

3. Applications for Colloquia in 1955

The following applications have been received for Colloquia in 1955:

1) Colloquium on the *Algebraic Theory of Numbers (Iyanaga, October 28, 1954)* to be held in Tokyo (Japan), September 9 - 13, 1955.

Subdivision of the main subjects comprise:

- 1 - Algebraic number fields and algebraic functions
- 2 - Quadratic forms and modular functions
- 3 - Cohomology theory
- 4 - Arithmetic of algebras
- 5 - Topological methods in numeral theory
- 6 - Some results on non-abelian extensions
- 7 - Applications of algebraic geometry to number theory
- 8 - Constructions of abelian corps (complex multiplication theory)

2) Colloquium for young topologists on *Algebraic Topology (Whitehead, October 25, 1954)* to be held in Oxford (England), June 28 - July 1, 1955.

It is planned to have 6 or 7 representatives from Eastern Europe and about 13 other countries (besides those from U. K.).

As will be explained later, the former Executive Committee has agreed to accept the cosponsorship for the Union for these Colloquia; and has decided to divide the UNESCO grant for Colloquia in 1955 (\$ 4.500) as follows:

Colloquium in Japan	\$ 4.000
Colloquium in Great Britain	.. 500
	<hr/>
	\$ 4.500

It was also agreed to implement the second grant by a sum not exceeding \$ 250 from other sources.

In compliance with Resolution No 5 (7) of the Second General Assembly a circular letter was sent to all the National Committees for Mathematics (January 20, 1955) so that they may call the attention of the Organizing Committees to experts whose participation is considered desirable.

4. Application for Colloquia in 1956

The following applications for Colloquia in 1956 have been received:

1) Colloquium on *Zeta Functions* (*Chandrasekharan*, April 27, August 9, 1954; February 4, 1955) to be held in Bombay (India) in February 1956.

The Colloquium will be organized by the Tata Institute of Fundamental Research. Representatives are expected from India and the neighbouring countries and a dozen foreign participants.

In conjunction with this Colloquium there will be a

2) South Asian Conference on *Mathematical Education*.

Estimated expenditures amount to \$ 5,000 of which 3,000 have already been granted (*Chandrasekharan*, February 11, 1955) by UNESCO.

An application is made to this Union for an additional grant of \$ 1,000.

3) Colloquium on *Algebraic Topology and its Applications* in August 1956 at Mexico City. Some formal backing from this Union is requested.

4) A Conference on the *Scientific Basis of School Mathematics* is planned by the International Commission for Mathematical Instruction, for September 1956, at Geneva.

D — RELATIONS WITH OTHER UNIONS, WITH ICSU-UNESCO AND WITH THE INTERNATIONAL COMPUTING CENTRE (I. C. C.)

1. Relations with other Unions

Prof. *van der Pol* accepted the invitation to represent this Union at the XIth General Assembly of the International Radio Scientific Union held in the Hague, Netherlands, August 22 — September 2, 1954. Prof. *van der Pol* was kind enough to indicate problems discussed at the meeting which may be of interest to mathematicians. These problems were communicated to various mathematical periodicals for suggested publication.

2. Relations with ICSU-UNESCO

Relations with ICSU (or with UNESCO through ICSU) are mainly of financial and organizational character.

Some general statements governing the financial relations of the Unions with ICSU are reported here pro-memoria:

The Secretary is accountable to ICSU also for sums transferred to the Chairman or Secretary of a Commission.

UNESCO expects to receive (from ICSU) a financial report with audited balance sheet as of 31 October of each year before the end of December of the same year.

This implies that notwithstanding the fact that UNESCO financial year begins on January 1st (whereas ICSU financial year begins on November 1st), a Union is not permitted to carry over money from one ICSU financial year to another (namely to November and December) without getting the permission of UNESCO to do so. The audited accounts of a Union should reach the ICSU Secretariat at November 15.

The use of a chartered accountant will become mandatory in 1957 (decision of the General Conference of UNESCO at Montevideo).

As regards the publication of papers presented at colloquia, congresses, symposia, etc., it has been established that "only contributions of real scientific merit should be published and that the fact of presentation at a colloquium, congress or symposium does not in itself assure the right of publication. Manuscripts should be submitted if possible for publication to journals with recognized standards of acceptance. If this is impossible a responsible editor for a special volume should be chosen, and acceptable standards for publication as far as possible ensured. Such volumes should always be made available for review to the appropriate scientific journals".

Organizations responsible for the publication of papers read at Symposia and Congresses are requested to transmit such publications, whether in the form of special number of established journal, or of special publications, to the Secretariat of the ICSU Abstracting Board, 3 Boulevard Pasteur, Paris, XV.

Volumes published with UNESCO financial help should have this fact put in clear evidence; a copy of these volumes should be sent to UNESCO Directories and News Bulletin are not encouraged.

UNESCO subsidized meetings must give notification to UNESCO in advance so that they may send an observer if they desire.

3. Sixth Meeting of ICSU Executive Board

The sixth meeting of the Executive Board of ICSU took place in Naples, October 5—7, 1954. This Union was represented by the President elect, *H. Hopf*, and the Secretary, *E. Bompiani*.

4. Next Meeting of the Executive Board

The next meeting of the ICSU Executive Board will take place in Oslo, August 8—12, 1955, together with the General Assembly of ICSU.

5. Admission of the International Union of Physiological Sciences to ICSU

A letter (signed *M. B. Visscher*) of application to ICSU was received and circulated among the Members of the Executive Committee (January 3, 1955).

Further inquiry to get more information on the reasons in favour or against the admission, gave no result. The admission of the said Union to ICSU will be discussed at the ICSU meeting in Oslo.

6. International Computing Centre (I. C. C.)

The Secretariat has been informed that the following nations have ratified the Convention instituting the I. C. C.: Belgium, Ceylon, Italy, Japan; other nations are expected to ratify soon.

UNESCO has given to the Organizing Committee the task of carrying out a comparative study regarding different types of electronic calculating machines, and of planning the equipment that the future Centre will require. 27 Calculating Laboratories and Institutes of 15 different countries have been consulted. A report on these subjects will be soon presented to UNESCO.

UNESCO is also planning an international commission of experts that will decide about the future activity of the Centre.

E — EXECUTIVE COMMITTEE MEETINGS

1. Third Executive Committee Meeting

The third meeting of the Executive Committee was held at the Hague, August 30 and September 1, 1954. The meeting was attended by Prof. *M. Stone*, President, *Hodge*, *Iyanaga* and *Bompiani*, Secretary. Professors *Borel* and *Kamke* excused their absence for reason of health.

The following also attended some sessions of the meeting: Dr. *Fraser* of ICSU, Messrs *Hutt* and *Whitlock* of Butterworths Publications Ltd.

The main purpose of the meeting was to draft the resolutions to be submitted to the Second General Assembly.

As the final adopted form of the resolutions was printed in the Record of the General Assembly, it will not be transcribed here.

The discussions with Messrs *Hutt* and *Whitlock* were fruitful and the suggestions were further developed in the meeting of the Commission on the World Directory (see B-1).

In the last session of the meeting the Executive Committee unanimously approved the following resolution concerning a conference on Mathematical Education in India:

"The Executive Committee of the International Mathematical Union welcomes with warm interest the proposal for a conference on Mathematical Education to be held in India in 1956 and desires to lend its active cooperation."

This resolution was made known (September 6, 1954) to *Shri D. D. Gupta*, Undersecretary to the Government of India in the Ministry of National Resources and Scientific Research, to Prof. *Chandrasekharan*, and to Prof. *Auger*, Director of the Division of Natural Sciences at UNESCO. A contribution by UNESCO of \$ 3,000 has later been granted.

2. Fourth Executive Committee Meeting

This meeting was held in Zurich, April 18, 19, 1955. It was attended by: *H. Hopf*, President, *A. Denjoy*, First Vice-President, *W. V. D. Hodge*, Second Vice-President, *E. Bompiani*, Secretary, *K. Chandrasekharan*, *J. F. Koksmä*, Members. Professor *Mac Lane* excused his absence.

The Executive Committee discussed the possibility of enlarging the membership of the Union and of increasing the group of adherence of a number of member nations; approved the agreements reached with the Österreichische Mathematische Gesellschaft for the publication of official IMU's news and for the organization of an information center to the service of the Commission on Exchange of Mathematicians. It also examined the submitted programmes of other Commissions and the necessity of nominating a new Chairman of the Commission on Scientific Publications after the resignation of Professor *Hille*.

The Executive Committee confirmed the decision of the former Executive Committee to act as co-sponsor of the Colloquia indicated in C-3,4 and appointed the representatives of the Executive Committee in their respective Organizing Committees. It also approved the financial report submitted by the Secretary (see F) and noted that no provision has been made by the Second General Assembly for contributions to the work of Commissions or

for unforeseen items of expenditures. In consequence the following resolution was adopted: "That the annual expenditure authorized by the Second General Assembly for 1955 — 1958 be increased by \$ 500 for contingencies".

A postal ballot on this resolution is already under way: dead-line July 30, 1955.

The Executive Committee also decided on a provisional breakdown of UNESCO's allocation for 1955, and took the necessary steps for the change of signatures at the Chase Manhattan Bank.

Professor *Hodge* reported on the preparation of the International Congress of Mathematicians to be held in Edinburgh (Scotland) in 1958.

F — FINANCIAL

1. Income in 1954

The two income sources are: a) dues paid by member nations; b) UNESCO-ICSU contributions.

a) In 1954 dues were paid at the

Chase National Bank: Austria, Canada, Cuba, Denmark, Israel, Japan, Malaya-Singapore, Norway, Pakistan, Switzerland, U. S. A., Yugoslavia, Pakistan (for 1953) \$ 2,086.50

Banca Nazionale del Lavoro: Australia, Belgium, Finland, France, Germany, Great Britain, Greece, India, Italy, Mexico, Netherlands, Spain, Sweden, Israel (second instalment for 1953), Spain (for 1953), Sweden (for 1953) Italian Lire 1.781.187.

Assuming the rate of exchange \$ 1 = It. Lire 624 the approximate equivalent of It. Lire 1.781.187 is of \$ 2,854.45 and therefore the total income from membership dues in 1954 was approximately of . . . \$ 4,940.85

At the end of December 1954 the dues of the following nations were still outstanding: Argentina, Brazil, Iceland, Peru, Portugal for a total amount of \$ 326.00. Peru should pay \$ 130.40 for 1952 and 1953.

b) UNESCO contributions through ICSU for 1954 in the various categories are as follows:

C. 2 News Bulletin - Directory of Mathematicians	\$ 1,190
C. 3 Executive Committee and Commissions	\$ 3,960
C. 4 Symposia (three)	\$ 5,940
Total	\$ 11,090

Extra income from ICSU (within-category virements)
(Italian Lire 9.979) approximately equivalent to \$ 16.02

The approximate total income received in 1954 is:

A - Membership dues	\$ 4,940.85
B - UNESCO contributions	\$ 11,090.00
ICSU contributions	\$ 16.02
Total	\$ 16,046.87

2. Expenditures in 1954

A) The expenditures authorized by the General Assembly for the year 1954 against IMU funds are as follows:

a) Secretarial help (First General Assembly)	\$ 1,500
b) Office expenses (Second General Assembly)	\$ 1,000
c) Travelling expenses for the Executive Committee (First General Assembly)	\$ 750
d) Contribution for the World Directory (authorized by postal ballot, January 18, 1954)	\$ 410
e) Contribution to ICSU (1% of dues actually received in 1954, Second General Assembly)	\$ 49.55

The following expenses in the categories a), b) have been actually met:

a) Secretarial help for 1954 Italian Lire 936.000 approximately equivalent to	\$ 1,500
b) Mail and office expenses Italian Lire 533.567; for rent of the "Rolzaal" and "Lairessezaal" for the Second General Assembly \$ 45; to Prof. Behnke for secretarial help and postage expenditures \$ 62; approximately equivalent to	\$ 994.10

Actual expenses in category c) against IMU funds amounted to \$ 298.55.

As nothing was spent by the Executive Committee for travel in 1952, the unexpended balance for the years 1952, 1953 and 1954 from IMU funds allotted to travel expenses amount to \$ 1,225.45.

The actual expenses for the Executive Committee meetings were:

In Paris, March 31, April 1, 1954:

Against IMU funds

Against UNESCO grant (C. 3) \$ 779.74

At the Hague, August 30, September 1, 1954:

Against IMU funds

Against UNESCO grant (C. 3) \$ 425.00

The expenditures in 1954 against UNESCO contribution have been as follows:

C. 2 To Butterworths for the preparation of the World Directory	\$ 590.00
To the Österreichische Mathematische Gesellschaft for the IMN	\$ 600.00
Total	\$ 1,190.00
C. 3 Meeting of the Executive Committee in Paris (March 31, April 1, 1954)	\$ 779.74
Meeting of the Executive Committee at the Hague (August 30, September 1, 1954)	\$ 425.00
Meeting of the Commission on the World Directory (London, December 20, 1954)	\$ 238.00
To the International Commission for Mathematical Instruction (\$ 500 + French Francs 175.000) approximately equivalent to	\$ 1,000.00
To the Commission for the Exchange of Mathematicians (in Amsterdam, September 9, 1954)	\$ 2,005.26
Total	\$ 4,448.00
C. 4 Symposia in Amsterdam (three)	\$ 5,940.00

3. Financial statement for the period January 1 – December 31, 1954

	<i>Actual Currencies Carried</i>		
	<i>Italian Lire</i>	\$	<i>French Francs</i>
<i>Opening Statement</i>			
Net Assets and Liabilities on December 31, 1953	284.361	5,131.89	240.930
— Assets	—	971.80	—
+ Liabilities	87.000	—	—
Bank balance and cash on hand to December 31, 1953	371.361	4,160.09	240.930
<i>Receipts</i>			
Dues for 1954	1,578.875	1,956.00	—
Dues for 1953	202.312	130.40	—
UNESCO contribution	—	11,090.00	—
ICSU contribution	9.979	—	—
Interest on accounts	3.650	—	—
Totals	1,794.816	13,176.40	—
<i>Expenditures</i>			
UNESCO expenditures C. 2	—	1,190.00	—
UNESCO expenditures C. 3	275.970	2,937.00	238.866
UNESCO expenditures C. 4	—	5,940.00	—
Travelling expenses chargeable to IMU funds	17.820	270.00	—
Expenses for publications chargeable to IMU funds	—	410.00	—
1% contribution paid to ICSU for 1954	—	49.55	—
Bank service expenditures	1.000	45	530
Secretarial help	936.000	—	—
Postage, Representation and Office expenditures	553.567	107.00	—
Back salaries (secretarial help for 1953)	87.000	—	—
Totals	1,871.357	10,904.00	239.396
<i>Closing Statement</i>			
Bank balance and cash on hand to December 31, 1954	294.820	6,432.49	1,534
+ Assets	—	456.40	—
— Liabilities	—	—	—
Net Assets and Liabilities on December 31, 1954	294.820	6,888.89	1,534
Bank balance on Dec. 31, 1953	371.361 +	4,160.09 +	240.930 +
Receipts	1,794.816 =	13,176.40 =	— =
	2,166.177 —	17,336.49 —	240.930 —
Expenditures	1,871.357 =	10,904.00 =	239.396 =
Balance on December 31, 1954	294.820	6,432.49	1,534

The undersigned Auditor of the IMU has checked the preceding accounts and found them correct, to be best of his information
(signed *B. de Finetti*).

4. Financial UNESCO grant for 1955 and requests for 1956

The following grant to IMU approved by ICSU Executive Board (Naples October 5-7, 1954) for 1955:

C. 2 Publications	\$ 4.500
C. 3 Executive Committee and Commissions	\$ 3.000
C. 4 Symposia	\$ 4.500
Total	<u>\$ 12.000</u>

The Secretary General of ICSU informed later (January 27, 1955) this Secretariat that UNESCO has authorized the payment of the preceding subvention.

The following requests have been forwarded to ICSU for 1956:

C. 2 Publications:	
Directory of Mathematicians	\$ 1.000
News Bulletin	\$ 1.000
C. 3 Executive Committee and Commissions	\$ 5.000
C. 4 Symposia (two or three)	\$ 5.000
Total	<u>\$ 12.000</u>

Notice has been received from the Secretary General of ICSU that in the XIIIth meeting of the Bureau of ICSU (Washington, D. C., March 7-12) the following allocations have been proposed for 1956:

C. 2 Publications	\$ 1.500
C. 3 Executive Committee and Commissions	\$ 4.000
C. 4 Symposia	\$ 2.500
Total	<u>\$ 8.000</u>

President Stone

COMMISSION ON EXCHANGE OF MATHEMATICIANS

Information Service

The Commission has organized, with the help of the Austrian Mathematical Society, an information service concerning (i) mathematicians normally resident outside Europe who are planning to visit one or more European countries, (ii) European mathematicians planning to travel in Europe but outside their own country.

In both cases, individual mathematicians are invited to communicate their plans to Prof. W. Wunderlich, Technische Hochschule, Karlsplatz 13, Wien IV (Austria). They should give any addresses at which they may be reached (with dates if known), and any wishes they may have as to meeting mathematicians with particular interests, or in particular countries. It may be helpful if they indicate which languages they speak. The information itself may be in English, French or German.

The information so received will be reproduced by the office of IMN and will be circulated from time to time. *It is at the disposal of any individual or institution interested, and any such individual or institution should ask to be placed on the mailing list.* A postcard addressed to Professor Wunderlich will suffice for this purpose.

The Commission cannot itself undertake the responsibility of arranging visits or exchanges, nor has it any funds available for that purpose.

The members of the Commission are prepared to advise mathematicians who are proposing to visit their respective countries. The members are:

- Prof. M. Brelot, Institut Henri Poincaré,
11, Rue Pierre-Curie, Paris 5e, France.
- Prof. H. Davenport (Chairman), University College,
London, W. C. 1, England.
- Prof. B. Eckmann, Technische Hochschule,
Zürich, Switzerland.
- Prof. S. Iyanaga, University of Tokyo,
Tokyo, Japan.
- Prof. B. Segre, Istituto Matematico,
Città Universitaria, Roma, Italy.
- Prof. W. Süss, Mathematisches Institut,
Universität, Freiburg i. Br., Germany.
- Prof. W. Wunderlich, Technische Hochschule,
Karlsplatz 13, Wien IV, Austria.

H. Davenport (London)

End of the Bulletin of the International Mathematical Union