

TRANSACTIONS OF THE
INTERNATIONAL ASTRONOMICAL
UNION

VOL. XIII B (PROCEEDINGS 1967)

**PROCEEDINGS
OF THE THIRTEENTH
GENERAL ASSEMBLY
PRAGUE 1967**

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INTERNATIONAL COUNCIL OF SCIENTIFIC UNION
INTERNATIONAL ASTRONOMICAL UNION
UNION ASTRONOMIQUE INTERNATIONALE

TRANSACTIONS
OF THE
INTERNATIONAL ASTRONOMICAL UNION
VOLUME XIII B

PROCEEDINGS
OF THE THIRTEENTH
GENERAL ASSEMBLY
PRAGUE 1967

Edited by

L. PEREK

General Secretary of the Union

PUBLISHED FOR THE INTERNATIONAL ASTRONOMICAL UNION
WITH THE FINANCIAL ASSISTANCE OF UNESCO



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TRANSACTIONS
OF THE
INTERNATIONAL
ASTRONOMICAL UNION
VOLUME XIIIIB – PROCEEDINGS

PREFACE

The present part, Volume XIII B, has the title *Proceedings of the General Assembly*. It contains the complete record of the Inaugural Ceremony; of the two sessions of the General Assembly; resolutions adopted by the General Assembly; Reports of 140 Meetings of Commissions; and a supplement to *Astronomer's Handbook* listing in principle only those parts which changed since the edition of IAU Transactions Vol. XIIC, (in particular the Membership of Commissions and Alphabetical List of Members of the Union).

Volume XIII A, with the title *Reports on Astronomy*, has been published before the present volume. It contains the Report of the Executive Committee and the Draft Reports of Commissions as presented to the General Assembly and as subsequently corrected. Additions to the Draft Reports which would have required the repagination of the Draft Reports, appear in the present volume in the reports of the Commissions.

The Invited Discourses, the Joint Discussions, the proceedings of meetings of Commission 17 on the Moon Probes, and a report on the joint meeting of Commission 10 and 44 on 'Coordination of Solar Observations Made at Ground-based Observatories and with Space Vehicles' will appear in a separate volume entitled 'Highlights of Astronomy as presented at the XIIIth General Assembly of the IAU, Praha 1967'.

Other scientific results, in particular those presented at the meetings of Commissions, are reported in the present volume in a very condensed form, as it is assumed that the papers will be published in full in the current astronomical periodicals and publications. This step was considered essential by the Executive Committee in order to avoid duplication in publishing scientific results.

Three Symposia were held immediately after the General Assembly:

No. 33: Physics and Dynamics of Meteors

No. 34: Planetary Nebulae

No. 35: The Structure and Development of Solar Active Regions. The proceedings of these Symposia will appear as separate volumes in the series of IAU Symposia, published by the D. Reidel Publishing Company, Dordrecht, The Netherlands.

I wish to express my thanks to all those who contributed to the present volume: to the Presidents and Secretaries of Commissions who prepared the reports of Commissions; my special thanks are due to those who submitted their reports with the proverb "bis dat qui cito dat" in mind. The preparation of Parts 1 and 4 would have been impossible without the competency and skill of Miss G. Drouin and Mrs J. Daňková.

Our new printer and publishing house, D. Reidel Publishing Company, deserves the thanks of the Union for the high quality of presentation and for keeping within the short printing delays promised.

L. PEREK
General Secretary

*Astronomical Institute, Czechoslovak Academy of Sciences
Budečská 6
Praha 2, Czechoslovakia*

21 November 1967



POL SWINGS

Membre de l'Académie Royale de Belgique

Directeur de l'Institut d'Astrophysique, Sclessin

PRÉSIDENT DE L'UNION ASTRONOMIQUE INTERNATIONALE

1964-1967

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PART 1

INAUGURAL CEREMONY



REPORT OF THE GENERAL ASSEMBLY

INAUGURAL CEREMONY

Tuesday, 22 August 1967 at 10^h 15^m

The Inaugural Ceremony took place in the Congress Hall of Julius Fučík Park of Culture in Prague, in the presence of a distinguished gathering of representatives of the Government of Czechoslovakia, the Czechoslovak Academy of Sciences, the Czechoslovak National Astronomical Committee, and many local organizations.

The Union was honoured by the presence of His Excellency the Acting Prime Minister of the Czechoslovak Socialist Republic, F. Krajčír, and the President of the Czechoslovak Academy of Sciences, Academician F. Šorm.

Professor Pol Swings, President of the International Astronomical Union, acted as chairman for the ceremony.

After a few words of welcome to Members and guests by Dr B. Šternberk, President of the Czechoslovak National Astronomical Committee and President of the Local Organizing Committee, and the execution, by the Prague Chamber Orchestra, of the Bohemian Suite in D major by A. Dvořák, the President called upon Mr F. Krajčír, Acting Prime Minister of the Czechoslovak Socialist Republic, to address the Assembly.

ADDRESS BY THE ACTING PRIME MINISTER OF THE CZECHOSLOVAK SOCIALIST REPUBLIC
MR F. KRAJČÍR

(English translation from Czech)

'Mr President, Ladies and Gentlemen, Dear Guests,

'As spokesman of the Government of the Czechoslovak Socialist Republic I warmly welcome your General Assembly to Prague. It is a great pleasure for me to be able to tell you how glad we are that this important scientific meeting is being held in the metropolis of our country.

'We recognize in you the most outstanding representatives of one of the oldest branches of science. Astronomy has helped mankind to unveil the secrets of the Universe and of natural laws, thus preparing the road for scientific and social progress. But truth and progress, as we know, often demanded heavy sacrifices also from astronomers, as they fought out-dated concepts and reactionary forces. Astronomy has always had a greatly stimulating effect upon the development of other scientific branches. Hence it is only natural that—especially with regard to the scientific revolution of our time—the best in science and technology serves the understanding of the world.

'The present-day achievements in space exploration have greatly stimulated the interest of the broad population in astronomy, too. This is borne out by numerous astronomical clubs at factories and schools as well as at public observatories—besides official astronomical institutions. The interest of Czechs and Slovaks in astronomy is traditional, and this tradition goes back to the oldest Central-European University in Prague with its astronomers of world-wide renown.

'During your stay in Czechoslovakia you will be certain to notice the large number of popular and scientific books, articles in newspapers and magazines, and radio and television programmes on astronomy. And now, the general public eagerly read and listen to the reports of your meetings. But you will also see, how much care and attention our Government devotes to the development of astronomy.

'The present rapid progress in science and engineering calls for close international co-operation. It is vitally important that the achievements of science serve progress and happiness, a better mutual understanding between nations, and that they are not abused for suppressing one nation by another or even threatening the very existence of mankind. Such international co-operation, however, is only possible in conditions of peace, goodwill and mutual confidence between nations. And here the International Astronomical Union plays a major role.

'Czechoslovak astronomers have always been doing their share in furthering international co-operation, and we feel deeply honoured that astronomers from all parts of the world have chosen Prague for their General Assembly.

'On behalf of the Government, permit me to express our firm belief that your deliberations here in Prague will contribute not only to progress in astronomy, but also towards a better understanding between nations and to their peaceful coexistence.

'The Government of the Czechoslovak Socialist Republic wishes your General Assembly lots of success and hopes that you will have a pleasant stay in our country.'

Professor Swings expressed his thanks to Mr Krajčír for his address, and invited Academician F. Šorm, President of the Czechoslovak Academy of Sciences, to address the gathering.

ADDRESS BY THE PRESIDENT OF THE CZECHOSLOVAK ACADEMY OF SCIENCES
ACADEMICIAN F. ŠORM

'Mr President, Ladies and Gentlemen, distinguished Guests,

'It is a great honour and a pleasant task, indeed, to welcome all of you most cordially—Members, Invited Participants and Guests of the thirteenth General Assembly of the International Astronomical Union—the biggest international meeting in the almost fifty year existence of your Union and in all history of the world astronomy so far—on behalf of the Czechoslovak Academy of Sciences, of our whole scientific community and on my own behalf, in the Czechoslovak Socialist Republic and her historical capital.

'We consider your presence in this country as a high tribute paid to all our science and as a culmination of more than 600 years of development of astronomy in the territory of the present Czechoslovak Socialist Republic. Allow me to mention in this connection that from the very beginning of existence of Prague Charles University—the oldest university in Central and Eastern Europe—astronomy had been taught here and valuable original astronomical observations had been practised.

'At the outset of the 17th century Prague actually became one of the cradles of modern astronomy. Tycho Brahe lived here only for a short time at the end of his days, unfortunately, but his two years of activity in Prague were in a way a completion of his life-long labours. He invited Johann Kepler here and, perhaps for the first time in history, co-operation between an astronomer-observer and a theoretician took place. It is only thanks to the linking of Tycho's accurate observations with Kepler's tireless search for regularities that Kepler was able to discover the laws of planetary movements which finally confirmed Copernicus's heliocentric system and opened the way for Newton's law of gravitation. This linking of observation and theory is symbolic also for the present astronomers' meeting, and continues to be a live heritage of both great astronomers whose urgency is apparent particularly at a time when rapid development of science and technology compels all astronomers to specialize in an ever greater degree.

'It is a great pity that this important astronomical center in Prague ceased to exist after the Thirty Years' War. The world's harmony which Johann Kepler was seeking in Universe disappeared from his life and from all Central Europe. The Thirty Years' War brought to the Czech nation economic and political catastrophe and loss of independence. The consequences were so severe that even in the last century much effort of the Czech and Slovak nations was expended on the preservation of their national languages and cultures.

'No wonder that under those circumstances our nations could hardly compete with well-developed and more fortunate nations in the development of natural sciences. Nevertheless, there has always been a deep interest in science in this country, and those who were able to become scientists strove to contribute to the progress in science in spite of their modest circumstances.

'Restoration of national independence after World War I was the first condition of better development of science in Czechoslovakia. We can justly say, however, that the way to full development opened only after Socialist Czechoslovakia came into existence and after the Czechoslovak Academy of Sciences was founded.

'The Czechoslovak Academy of Sciences following the almost 200 years tradition of older scientific societies is not only the top scientific institution of the Czechoslovak Socialist Republic but also a big working scientific organism which, besides 200 Academy members—the most prominent Czech and Slovak scientists—comprises 115 scientific institutions with more than 12000 collaborators and an extensive net of working and managing scientific organs and societies. The Czechoslovak Academy of Sciences is active in all main fields of natural sciences, in basic theoretical branches of technical sciences, as well as social sciences.

'You will find that within the Czechoslovak Academy of Sciences astronomy has found unprecedentedly favourable conditions for its development. Two big astronomical institutes, at Ondřejov and at Skalná Pleso (Rocky Lake), were enlarged considerably and their scientific equipment is now incomparably better than even in recent past. It may suffice to mention only the big solar laboratory at Ondřejov, the coronagraph on Lomnický Štít and the telescope of 79 inches (2 meters) in diameter being completed at Ondřejov. Before World War II there used to be two resident professional astronomers at Ondřejov, now there are almost thirty of them.

'Needless to say, we are pleased to hear compliments from our guests on the level of our astronomers' work. We appreciate the results of their research of the Sun, meteors, high atmosphere, comets, double stars and stellar systems.

'Scientific work in a small country has, however, always its specific problems. In no branch of science can we afford to carry out research in all directions like big powers. The Presidium of the Czechoslovak Academy of Sciences keeps urging astronomers—as well as scientists of other branches—to concentrate their efforts and means on a small number of fundamental, topical scientific problems. We believe that the situation in Czechoslovak astronomy in this respect is not bad; a few larger working groups with clear and systematic programs have been set up. However, the principle—not to disperse efforts—should be fought for all the time; there is always a certain strain between a rational directive towards concentrated collective work and natural centrifugal tendencies of individuals whose thinking, work enthusiasm and individual interest, in the long run, push scientific progress forward.

'From the standpoint of Czechoslovak astronomers' work, two types of foreign guests have come to this Congress. Many of you know our astronomers from joint work, from symposia and from publications. You work on the same similar problems; you will certainly have much experience, knowledge and suggestions to exchange with our scientists. The second category of astronomers, at least as numerous as the first one, works in branches which are not developed in this country, for one reason or another. Their contacts with Czechoslovak astronomers may be less direct and frequent but, believe us, we appreciate their presence just as much. They also bring much knowledge of great interest for every astronomer without regard to his specialized field of work.

'Many young Czechoslovak astronomers will have, for the first time, an opportunity to see or even to talk to personalities known to them hitherto only from literature. It will certainly be a stimulus for their further work. Not only astronomers themselves are looking forward to your Congress but also general Czechoslovak public. The Czechoslovak Astronomical Society attached to the Czechoslovak Academy of Sciences celebrates the 50th anniversary of its foundation this year.

'Society's conditions for admission of new members include active participation in a certain branch of astronomy, not only mere interest. In spite of that the Society has now about 800 members. Further thousands of other astronomy fans belong to scores of astronomical circles and clubs attached to plants, schools, and almost sixty public observatories.

'Three hundred sixty years ago Prague was a real capital of the astronomical world. Now it has become the capital again, at least for a few days. Allow me, then, to wish your session a complete success in the spirit of that tradition and to express my hope that this Assembly will contribute a great deal to the carrying out of the noble goals of the International Astronomical Union. Thank you.'

The Chairman thanked Professor Šorm and then invited Dr Šternberk, President of the Czechoslovak National Astronomical Committee and President of the Local Organizing Committee, to speak.

ADDRESS BY THE PRESIDENT OF THE CZECHOSLOVAK NATIONAL ASTRONOMICAL
COMMITTEE, DR B. ŠTERNBERK

'Monsieur le Président, Mesdames et Messieurs, Chers Hôtes,

'Permettez-moi de vous saluer tout d'abord au nom du Comité Local d'Organisation de la treizième Assemblée Générale de l'Union Astronomique Internationale. Vous avez aimablement accepté notre invitation à y participer, ce qui nous fait un plaisir immense et nous vous souhaitons la bienvenue de tout notre coeur.

'Nous avons pour tâche et nous nous efforçons de préparer les conditions nécessaires à la réussite de ce Congrès. Toutefois, nous désirions également profiter de cette occasion pour vous familiariser avec les beautés de cette ville ancienne, de tout notre pays et avec la vie que nous y menons. Lorsque, il y a six ans, nous avons présenté pour la première fois au Comité Exécutif de l'UAI notre projet de choisir Prague pour la session de cette année, nous ne nous doutions pas que la face de notre capitale serait altérée par la construction du métro, juste en cette année. Heureusement ces travaux n'ont pas encore envahi la Vieille Ville qui vous intéressera sans doute le plus. C'est vrai qu'il est un peu difficile de se frayer le chemin depuis les hôtels de la place Venceslas jusqu'au siège de notre Congrès, mais nous espérons que les astronomes, qui connaissent bien les orbites des corps célestes, sauront également trouver leur chemin à travers les nombreux passages qui remplacent le carrefour de la place Venceslas.

'Le Comité Local d'Organisation vous a mis succinctement au courant de l'astronomie dans notre pays dans la brochure "La Tchécoslovaquie accueille les astronomes". En outre, il a distribué à tous les participants la brochure "L'astronomie en Tchécoslovaquie". Vous y trouverez des informations détaillées sur l'histoire et l'état actuel de notre astronomie, sur les observatoires scientifiques tchécoslovaques, sur leur travail et aussi sur l'ample vulgarisation de l'astronomie dans notre pays. Je ne les répéterai pas. Je vous demande toutefois de me permettre de vous saluer également au nom du Comité Astronomique National Tchécoslovaque et des instituts qu'il représente au sein de l'Union, à savoir les instituts de l'Académie tchécoslovaque des Sciences, de l'Académie slovaque des Sciences, de l'Enseignement Supérieur tchécoslovaque avec l'Université Charles à sa tête et les autres institutions.

'Je vous souhaite la bienvenue aussi au nom de la Société Astronomique Tchécoslovaque auprès de l'Académie tchécoslovaque des Sciences, qui groupe dans notre pays les travailleurs scientifiques et les spécialistes du domaine de l'astronomie. La Société est heureuse de pouvoir, en son année jubilaire, saluer à Prague les plus grands astronomes du monde entier.

'Je vous salue, enfin, au nom de la rédaction de notre revue scientifique "Bulletin of the astronomical Institutes of Czechoslovakia" qui a eu l'honneur de présenter sur ses pages les contributions des astronomes étrangers.

'Depuis des siècles déjà, notre pays partage l'idée qui constitue la raison d'être de notre Union, à savoir celle de la coopération internationale dans l'astronomie. L'astronome et médecin tchèque Tadeáš Hájek de Hájek a été le prédécesseur de notre collègue très estimé, le Président de la Commission 38 de l'UAI pour l'Echange des Astronomes, le Professeur Minnaert, car ce fut Hájek qui organisa le stage de Tycho Brahé à Prague, pour utiliser des termes actuels.

'Nous partageons l'idée de l'échange d'astronomes et de collaboration encore aujourd'hui, et, à

l'heure actuelle, des astronomes de divers pays, par exemple soviétiques et américains, font des stages à nos observatoires. Permettez-moi de remercier à cette occasion l'Union, les savants et les observatoires étrangers d'avoir permis également à nos astronomes de travailler dans d'autres instituts.

'Pour terminer, voici une petite réminiscence. Il est bon de se rendre compte de l'accroissement spectaculaire des connaissances scientifiques au cours d'une seule génération. Lorsque, il y a 50 ans, je commençais ma carrière d'astronome, l'astrophysique était encore incapable de répondre à la question de savoir ce qu'étaient les nébuleuses spirales, si elles faisaient oui ou non partie de notre Voie Lactée. On commençait alors à se douter que l'astronomie se tenait au seuil d'une grande découverte qui devait par la suite extrêmement élargir les horizons de l'humanité. Je pense, et avec moi le pensent aussi d'autres collègues, que la situation est, peut-être, un peu analogue aujourd'hui et nous espérons que, pendant le Congrès, nous en serons amplement informés par les personnes les plus compétentes.

'Au nom des astronomes tchécoslovaques, je souhaite un plein succès aux discussions de la treizième Assemblée Générale de l'Union Astronomique Internationale.'

Professor Swings then expressed the thanks and the gratitude of the Union as follows:

'Messieurs les Représentants du Gouvernement de la République Socialiste Tchécoslovaque,

'Messieurs les Membres du Présidium de l'Académie Tchécoslovaque des Sciences,

'Monsieur le Président de l'Académie des Sciences, Professeur Šorm,

'C'est à vous, Messieurs, que l'Union Astronomique Internationale désire d'abord exprimer sa gratitude, car c'est vous qui avez rendu possible le treizième Congrès de notre Union. Tous les astronomes, venus à Prague, de tant de pays, parfois fort éloignés, vous sont aussi reconnaissants pour les paroles si aimables et si hospitalières que vous avez bien voulu prononcer. Votre pays est connu pour son hospitalité, autant que pour son niveau intellectuel et artistique élevé. Mais pour nous, astronomes, la Tchécoslovaquie est, avant tout, un centre très important de recherches astronomiques. Tous, nous savons que votre nation a un passé astronomique prestigieux et que le présent est, en tout point, digne de ce passé. Nous avons aussi la certitude que, grâce à l'aide du Gouvernement et de l'Académie, l'avenir de l'École Tchécoslovaque d'Astronomie sera très prospère. Au nom de tous mes collègues de l'Union, je vous remercie bien sincèrement.'

'Monsieur le Président du Comité d'Organisation et Cher Ami, Professeur Šternberk,

'Monsieur l'Ingénieur Rajský, cheville ouvrière du Comité, Messieurs les Membres du Comité,

'All of us here realize the tremendous amount of work which has been required for the organization of the present meeting. All the records of attendance have been beaten. All our expectations have been surpassed. This is partly due to the steady increase in the attractiveness of our Science. But I am also convinced that many of us have been attracted by the desire to get in closer contact with the renowned Astronomical School of Czechoslovakia. Let us be quite frank. Many of us also wanted to see your wonderful capital city, so full of artistic atmosphere and historical recollections, and to visit part of your beautiful country.

'To the President of the Organizing Committee, Professor Šternberk; to his principal associate, Engineer Rajský; to all the colleagues and their collaborators who took part in the preparation of our General Assembly we express our heart-felt thanks.'

Dr Šternberk then invited the President of the Union to address the Assembly.

ADDRESS BY THE PRESIDENT OF THE INTERNATIONAL ASTRONOMICAL UNION
PROFESSOR POL SWINGS

'Lorsque, à la fin de la douzième Assemblée Générale de Hambourg, nous avons entendu le Professeur Guth inviter l'Union Astronomique Internationale, au nom de Monsieur le Président de

l'Académie, le Professeur Šorm, à tenir notre treizième Assemblée à Prague, nous avons, tous, éprouvé une vive émotion et une grande joie. Le Professeur Guth nous a rappelé quelques souvenirs de savants éminents ayant trouvé à Prague l'hospitalité et la quiétude nécessaires à leurs travaux: Tycho Brahé, Johannes Kepler, Christian Doppler, Albert Einstein. Ces souvenirs illustraient l'hospitalité dont Prague fait preuve vis-à-vis des étrangers, ainsi que l'intérêt qui a toujours été accordé ici à l'Astronomie. En fait, cet intérêt a été manifesté depuis plus de 600 ans lors de la création de l'Université Charles en 1348. Nous savions que l'atmosphère intellectuelle et artistique bien connue de Prague serait propice au succès de notre treizième Assemblée Générale. D'ailleurs, depuis 45 ans, les astronomes tchécoslovaques ont joué un rôle très important au sein de l'UAI. Faut-il rappeler que le Professeur Nušl dont on fête cette année le centenaire de la naissance, fut Vice-Président de l'Union de 1928 à 1935 et premier directeur de l'Observatoire d'Ondřejov; que mon cher et honoré Collègue, le Professeur Šternberk qui, cette année, atteint comme l'Observatoire d'Ondřejov, son 70-ème anniversaire, remplit une tâche importante comme Vice-Président de 1958 à 1964; que de nombreux savants tchécoslovaques ont été présidents, vice-présidents ou membres de commissions depuis 1922; que mon ami, le Professeur Luboš Perek, oeuvre remarquablement, depuis trois ans, au sein du Comité Exécutif et qu'il va, sûrement, être amené à remplir la tâche la plus importante et la plus lourde au cours du prochain triennat; enfin, que la Société Astronomique de Tchécoslovaquie fête cette année son cinquantième.

'Nous verrons tous, dans peu de jours, le nouveau télescope de deux mètres grâce auquel nos collègues tchécoslovaques pourront s'attaquer aux importants problèmes d'actualité et nous sommes heureux que cette inauguration coïncide avec notre Assemblée Générale. Je profite de l'occasion aussi pour rendre hommage à la mémoire de Dr Bečvář, dont les Atlas rendent tant de services, notamment à nos élèves et à nos jeunes collègues entrant dans la carrière.

'L'histoire de l'Astronomie tchécoslovaque, il est inutile que je vous en parle en détail, puisque le Comité Organisateur a bien voulu remettre à chacun de nous sa magnifique petite brochure "La Tchécoslovaquie accueille les astronomes". Nous lui en sommes reconnaissants, comme pour toutes les autres marques d'hospitalité dont nous aurons l'occasion de reparler plus tard.

'I feel most unhappy not to have learned the Czech or the Slovak language. It was really my intention to do it, so that I could have expressed in a more proper and thankful way the gratitude of the Union. I acquired all the necessary books; but unfortunately I could really not find the time, and I apologize most sincerely for this.

'All the Members have received the *Astronomer's Handbook* prepared by our General Secretary. I hope that those of us who were not well acquainted with the history, Statutes, By-laws, etc. have read the corresponding sections. The article 1 of our Statutes reads:

"The objects of the International Astronomical Union are:

- (a) to facilitate relations between astronomers of different countries where the organization of international co-operation is useful or necessary;
- (b) to promote the study and development of Astronomy in all its departments."

'We are still as much in accord with these principles today as were our founders in Brussels in July 1919, when the IAU was established, together with three other sister Unions by the International Research Council. Only on one point have our views changed somewhat. In 1925 W. W. Campbell expressed the view that the purposes of our Union refer to future developments, rather than to a recital of the accomplishments of the past. At present, our IAU Symposia and Colloquia are after all more or less recitals, but they help us as a basis for our future programs.

'L'UAI, au moment de sa première Assemblée Générale à Rome en 1922, comprenait 19 Nations Adhérentes—dont la Tchécoslovaquie—, 32 Commissions et 207 Membres dont 83 étaient présents à Rome; le volume du Congrès avait 247 pages. Au dernier Congrès, avant la guerre, en 1938, l'UAI avait 554 Membres, dont 293 se trouvaient à Stockholm. Peu à peu, les Commissions consacraient plus de temps aux échanges scientifiques et proportionnellement moins aux questions administratives. Les travaux des 45 Commissions avaient été réunis en un volume de 518 pages. Lors de la dernière Assemblée, avant celle de Prague, il y avait 1630 Membres, dont 1160 se trouvaient à Hambourg; les 3 volumes des *Transactions* avaient un total de 1688 pages.