

**A HISTORY OF THE INTERNATIONAL
UNION OF MICROBIOLOGICAL SOCIETIES
1927-1990**

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TABLE OF CONTENTS

List of Acronyms	ii
Introduction	2
Chapter 1: Foundation (1927-1930)	14
Chapter 2: The Difficult Years (1931-1939)	30
Chapter 3: Expansion and Integration (1940-1953)	47
Chapter 4: The New Consolidation (1954-1962)	71
Chapter 5: An Effective Organization (1963-1971)	94
Chapter 6: Decentralization and Diversification (1972-1990)	134
Conclusion: International Microbiology - Past, Present and Future	168
Appendix: IUMS Officers and International Congresses for Microbiology	173

LIST OF ACRONYMS

(* designates committee, commission or federation of IUMS)

ASM	--	American Society for Microbiology
CBW	--	Chemical/Biological Warfare
CCICMS Medicales	--	Council pour the Coordination des Congres Internationaux des Science
CIOMS	--	Council for International Organizations in Medical Sciences
COGENE	--	UNESCO Scientific Committee on Genetic Experimentation
COMCOF	--	Committees, Commissions and Federations of IUMS
GIAM	--	Conference for the Global Impacts of Applied Microbiology
IABS*	--	International Association of Biological Standardization
IAMB	--	International Association of Microbiologists
IAMS	--	International Association of Microbiological Societies
IBP	--	International Biological Program
ICEAM*	--	International Committee on Economic and Applied Microbiology
ICEPT*	--	International Committee of Enteric Phage Typing
ICFMH*	--	International Committee on Food Microbiology and Hygiene
ICOME*	--	International Committee on Microbial Ecology
ICNB* ICSB	--	International Committee for the Nomenclature of Bacteria, replaced by the
ICNV* ICTV	--	International Committee for the Nomenclature of Viruses, replaced by
ICRO	--	International Cell Research Organizations

ICSB*	--	International Committee on Systematic Bacteriology
ICSU	--	International Council of Scientific Unions
ICMT*	--	International Commission on Mycotoxicology
ICTF*	--	International Commission on Taxonomy of Fungi
ICTV*	--	International Committee for the Taxonomy of Viruses
ICYYM*	--	International Commission on Yeast and Yeast-like Microorganisms
IFCC	--	International Federation of Culture Collections
IMGC*	--	International Microbial Genetics Commission
IOBB	--	International Organization for Bioengineering and Biotechnology
IRC	--	International Research Council
ISHAM*	--	International Society for Human and Animal Mycology
ISM	--	International Society for Microbiology
ISPP	--	International Society for Plant Pathology
IUMS	--	International Union of Microbiological Societies
IUBS	--	International Union of Biological Sciences
MAB	--	Man and the Biosphere
MEMIC*	--	Medical Microbiology Interdisciplinary Committee
PCVN*	--	Provisional Committee for Virus Nomenclature, replaced by ICNV
SIPRI	--	Stockholm International Peace Research Institute
SCOPE	--	Special Committee on Problems of the Environment
UNEP	--	United National Environment Program
UNESCO	--	United Nations Educational, Scientific and Cultural Organization

WFCC* -- World Federation of Culture Collections
WHO -- World Health Organization

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INTRODUCTION

The International Union of Microbiological Societies was founded over sixty years ago. Since 1927, the association has undergone four name changes and eight major reorganizations. However, in many respects, there has been a surprising continuity of goals and direction. The first international efforts in microbiology occurred at a unique time in the discipline's history. By 1920, the “golden age” of microbiology was coming to a close. Robert Koch and Louis Pasteur had passed on, and their immediate disciples were reaching the end of their productive careers.

Nonetheless, microbiology experienced a phase of rapid proliferation and specialization. Productive research was no longer confined to France, Germany and Britain; first-rate laboratories appeared in the United States, Japan, Russia, Chile, Hungary and many developing countries. More importantly, microbiologists were investigating numerous organisms (*e.g.*, bacteria, viruses, fungi, protozoa, etc.) in a myriad of contexts (*e.g.*, dairying, water treatment, veterinary medicine, industrial fermentations, agriculture). By the third decade of this century, medical bacteriology represented only a fraction of microbiology's domain.

Additionally, the number of microbiologists increased by health departments and medical colleges, the number of published articles greatly outstripped the capacity of the available journals. An international organization devoted to microbiology was necessary to deal with these dramatic developments.

The following chapters will provide a detailed historical account of the International Union of Microbiological Societies and its ancestral organizations, investigating not only the institutional changes of the association, but also revealing its involvement in the conceptual development of microbiology. A recurrent theme of this account will be the organization's role in integrating the several fields and specializations of microbiology. As an “umbrella” society, its task was often seen as promoting important cross-fertilizations among the distinct areas of research and the differing national research contexts. An important role of an “umbrella” society is to promote connections between different research locations and research topics. Elsewhere¹, I have referred to this function as the “promotion of interfield connections.”

The international organizations for microbiology were able to accomplish these integrating tasks in a number of ways. The most obvious mechanism has been the International Congresses for Microbiology. Fourteen of these gatherings have brought together thousands of microbiologists and the importance of the congresses should not be understated. Landmark papers were presented, heated debates were mediated, and lasting personal contacts were established. While the enormous size of these endeavors occasionally were thought to jeopardize their usefulness, the wholesale abandonment of international congresses could not be legitimately advocated.

¹ Eric D. Kupferberg, “The International Society for Microbiology and the Promotion of Interfield Connections” (M.A. thesis, University of Maryland, 1989), chapters 2 & 5.

Before investigating the specific history of the International Union of Microbiological Societies, a broader contextual view of international scientific endeavors is necessary. Microbiology was not the first (nor does it remain the only) discipline to encourage international collaboration. The rise of international scientific congresses can be dated to the mid-nineteenth century. To be sure, the tradition of international scientific collaboration existed much earlier. The Royal Society of London, the Paris Academy of Sciences and the Berlin Academy each had a number of foreign associates who occasionally corresponded and traveled on an international basis. Botanists and zoologists had toured for centuries, partly to meet one another, but also to review other collections of living plants and animals.² The fields of chemistry and physics had attained an international character, often through the travel of students and assistants. The growth of scholarly journals in the nineteenth century further extended the transnational scope of science.

By the fifth decade of the nineteenth century, the costs and inconvenience of travel had greatly diminished. The political situation in Europe fostered intellectual exchanges, occasionally in the form of grand exhibitions. As a result, the possibility of gathering the major researchers within a given discipline for an international meeting became a reality. The First International Botanical Congress, for example, was held in 1864 in Brussels and was attended by over five hundred scientists. The First International Zoological Congress and the First International Congress for Chemistry followed in 1889 and 1892, respectively.

During the first quarter of the twentieth century, international scientific congresses proliferated. Often they were very narrow in scope, devoted to a single problem (*e.g.*, the International Conference on Rabies) or to a particular technique (*e.g.*, ultraviolet microscopy). However, there were a few attempts at creating broad, umbrella organizations (such as the International Association of Academies or the International Bureau of Scientific Exchange). These broader organizations were intended to integrate the work of the various national scientific societies that had developed in the previous decades and often coordinated bibliographical efforts to cope with the brisk production of relevant literature.

The ancestral origin of the International Union of Microbiological Societies (IUMS) is found in the International Society for Microbiology (ISM). Established in the late 1920's, the ISM had several fortunate characteristics which enabled it to perform its "umbrella" function. In the preceding forty years, microbiology had been remarkably adept at producing a plethora of benefits to medicine, agriculture, industrial productions, etc. The ISM arose at a time when scientific institutions and the general public believed that the new fields of microbiology had barely been investigated. The first three congresses were held (just as university departments, academic journals and private foundations were created) to promote the study of microbiology. The ISM also had the good fortune of having strong administrative and logistical support from its founders and outside institutions.

The ability of the International Society for Microbiology to integrate microbiology was partially determined by the general characteristics of scientific societies. In many ways, the ISM served the same functions that national and local scientific societies had served for centuries. Scientific societies influenced the relations between fields by shaping the conceptual features of each, and by encouraging contact and cooperation among members from different research

² Frans A. Stafleu, "Fifty Years of International Biology," *Taxon* 20 (February 1971), 142.

locations. In other respects, the **umbrella** function of this **international** organization for an **applied** science rendered its role unique.

In order to understand the unique features of the IUMS and its predecessors, a discussion of the general characteristics of scientific societies is in order. Fortunately, the literature in the history and sociology of science has provided several accounts of these institutions and their characteristics. “A scientific society is generally described as an association of scientists organized for and committed to the advancement of (a particular) science.”³ Usually, this advancement is equated with the further production of new knowledge.

The role of scientific societies in promoting the production of new knowledge has, however, changed. In the seventeenth and eighteenth centuries, their role was two-fold: the **creation** of new knowledge, and the **reporting** of new knowledge. While representing several branches of natural philosophy, these organizations took an active part in the actual conduct of new research. In addition to devising standards for instrumentation, measurement and the conduct of experimentation, several societies provided funds, instruments and sites for research.

In her description of the scientific societies of the seventeenth century, Martha Ornstein described the compatibility of their dual functions:

The societies concentrated considerable groups of scientists, performed experiments and investigations impossible to individual effort, encouraged individual scientists and gave them both opportunity and leisure, often through financial support, for scientific work. They became centers of scientific information (*fora sapientiae*), published and translated scientific books, promulgated periodically scientific discoveries, and thus co-ordinated the scientific efforts of the various progressive European countries.⁴

These activities continued well into the nineteenth century. By the middle of the century, however, the societies and their capacities changed. Gradually, the university replaced the society as the primary agent for bringing scientists together and providing the physical and financial resources for scientific work. As science became more specialized and research centers geographically disperse, the need for a clearing-house of information was obvious. Margaret Rossiter illustrates this need with an example of an agricultural researcher in the mid-nineteenth century:

. . . the young scientist in a rapidly growing field was faced with the frustrating realization that vast new areas were opening up of which he knew nothing, that current work elsewhere in the nation might be especially useful for his own researches, and that what ever station bulletins or bureau publications he might manage to find and read would already be out-of-date and not tell him enough of the very things he most wanted to know--the informal comments, the hunches and hints of fellow workers in the same field.⁵

³ Karen B. Levitan, “Functions of Scientific Societies: Views of Biomedical Scientists,” (Ph.D. diss., University of Maryland, 1976), 4.

⁴ Martha Ornstein, The Role of Scientific Societies in the Seventeenth Century, 3rd ed. (London: Archon Books, 1963), 260.

⁵ Margaret W. Rossiter, “The Organization of the Agricultural Sciences,” in The Organization of Knowledge in Modern America, 1860-1920, eds. Alexandra Oleson and John Voss (Baltimore: Johns Hopkins University Press, 1979), 219.

Societies themselves became more numerous and more specialized. As a result, scientific societies evolved as organizations uniquely dedicated to providing opportunities to publish and disseminate scientific information, to air scientific controversy and to judge the worth of scientific discoveries.

There are several mechanisms in which scientific societies enhance communication among scientists. The meetings themselves bring together scientists of differing training, occupation, and concerns, thereby “broadening” the views and enhancing the productivity of a researcher.⁶ The presentations at the meetings provide a means for scientists to learn of the most recent discoveries, to gain an overview of the field and to put their own work in a broader scientific perspective. Often, these meetings were a critical tool in forming a consensus on the core conceptual tools among researchers working on similar topics.

As Ralph Bates concludes in his historical survey of scientific societies:

These symposia now furnish indispensable forums for the presentation and discussion of scientific papers. The sessions offer the most convenient time for threshing out disagreements and clearing up difficulties. The critical atmosphere which pervades the scientific meeting offers some guarantee against smug complacency or a tendency to be too dogmatic or assertive.⁷

The congresses and publications of a society also provided an opportunity for the creation of informal ties among scientists. These ties were crucial to the establishment of cooperative efforts among researchers from the different locations.⁸

Unquestionably, the publications of scientific societies have done much to stimulate cooperation in research, helping scientists and scientific societies to keep in touch with each other. Those who would promote international good will and cooperation see in the wide exchange of publications a means for tearing down barriers of race, creed, and nationality, and for bringing about unity of effort on the part of the scientific fraternity throughout the world.⁹

The International Society for Microbiology mirrors some, but not all, of the above general functions of scientific societies. Its meetings were well attended, and presumably the published proceedings were read by many participants. In sessions and lectures, a host of conceptual issues were discussed, and attempts were made to resolve a few controversies. The Congresses provided ample time for formal and informal discussion, and the establishment of contact between researchers was seen by many as a profitable byproduct of the international meetings.

The IUMS is partially distinguished by its **international** and **umbrella** characteristics.

⁶ Donald C. Pelz and Frank M. Andrews, Scientists in Organizations: Productive Climates for Research and Development, rev. ed. (Ann Arbor: University of Michigan Press, 1976), 53.

⁷ Ralph S. Bates, Scientific Societies in America, 3rd ed. (Cambridge: MIT Press, 1964), 173.

⁸ In her survey of biomedical researchers, Levitan reports these conclusions, 151. “The annual meeting was considered a major, if not the major function of scientific societies. The annual meeting was described as a primary reason for joining scientific societies, a major channel for formal and informal communication, a key source of current information, stimulating and inspiring event, an important means of socialization and of career improvement and a way to keep science open and prevent cliques from dominating areas of scientific research.”

⁹ Bates, 175.

Because the ISM was international, it was able to gather researchers from different nations who frequently approached separate microbiological topics employing dissimilar conceptual tools. Since these researchers were truly geographically isolated, the IUMS's role in disseminating information should not be underestimated.

The international character placed an additional duty on the ISM, standardization.¹⁰ Maurice Crosland contends that a primary justification for calling an international congress was to obtain authority to introduce certain conventions in a particular science. Often, these international congresses were organized to reach an agreement on a common nomenclature or language, especially in the biological sciences, geology and chemistry.¹¹ Indeed, this was a primary concern of the First International Statistical Congress in 1855, the First International Congress of Meteorology in 1873 and the Second International Botanical Congress of 1867. It could also be argued that the century of international collaboration devoted to establishing the metric system is an example of such semantic standardization.

Crosland further suggests that efforts toward standardization of nomenclature might have been the *raison d'être* of international scientific cooperation in the nineteenth century. A concluding comment on the whole question of standardisation of nomenclature is that the importance of agreement on names and units tended to override considerations of national prestige and priority. It provided a strong incentive for scientists to meet and work out some agreement. When scientist had become accustomed to such international meetings they found that there were other advantages both intellectual and social in such meetings and they therefore tended to become permanently established.¹²

International health organizations had traditionally sought to standardize procedures for medical microbiological products. A whole range of modern remedies -- antitoxins, hormones, vitamins, and certain drugs -- required that their strength be biologically measured against a standard preparation. An early example is found in the 1923 efforts to uniformly set world-wide levels for the safe use of insulin in the treatment of diabetes, and later in the League of Nations Health Organization's role in the standardization of penicillin production.¹³

The **umbrella** characteristic of the IUMS and its ancestors is seen in two respects. First, they embodied loose federations of national societies. Second, they intended to represent all fields of microbiology, from basic and applied bacteriology to virology and protozoology. Responding to the continued drive toward specialization, several national societies in the nineteenth century were primarily umbrella organizations. The American Association for the Advancement of Science was a society divided into several loosely confederated sections, each

¹⁰ This is not to suggest that national societies did not also attempt to standardize procedures and nomenclature. For example, Rossiter reports that the Association of Official Agricultural Chemists (AOAC) was established to standardize tests and measurements of fertilizers in order to facilitate uniform legislation on correct labeling and fair pricing, 215.

¹¹ M.P. Crosland, "Aspects of International Scientific Collaboration and Organization Before 1900," in Human Implications of Scientific Advance, Proceedings of the XVth International Congress of the History of Science, Edinburgh 10-15, August 1977, ed. E.G. Forbes (Edinburgh: Edinburgh University Press, 1978), 119.

¹² Crosland, 121.

¹³ See, Henry Dale, "International Activities in Science," Nature 154 (Dec. 9, 1944), 724-6.

representing a distinct discipline and several affiliated societies.¹⁴ While remaining functionally autonomous, the individual societies benefitted from a larger degree of cooperation through their contacts with the Association. The specialization movement rendered it all the more imperative that there should be societies of general scope to keep researchers in various fields in contact with one another. George Ellery Hale, the eminent astronomer and promoter of National Academy of Sciences, commented in 1920:

While the multiplication of societies dealing with narrowly limited fields of science is a sign of progress, the complete separation of investigators who might work in cooperation is certainly not desirable. In fact, the increase of specialization, instead of rendering unnecessary organizations dealing with science as a whole, has served to emphasize their extensive possibilities.¹⁵

The need for an umbrella organization is especially evident in those disciplines that contain drastically differing fields of study. Microbiology was one such discipline. A bacteriologist working at an agricultural experiment station or pharmaceutical firm deals with very different questions and in a very different work environment from a medical school bacteriologist or one attached to a research team at the Rockefeller Foundation. And, bacteriologists as a group would differ from those protozoologists interested in tropical medicine. If an organization were to attempt to encompass microbiology *in toto*, it would necessarily be umbrella in nature.¹⁶

The International Society for Microbiology was formed when several national societies for microbiology had already been established. Moreover, numerous specialist and local societies were in existence. For example, a partial listing of early microbiological societies in America would include: the American Microscopical Society (1878), the Society of American Bacteriologists (1900), the San Francisco Microscopical Society (1870), the New York Microscopical Society (1877), the Rochester Microscopical Society (1879), and the American Mycological Society (1903).¹⁷

The International Society for Microbiology was in a particularly good position to integrate microbiology. Its **international** and **umbrella** characteristics fostered communication and interactions among nations whose research differed in conceptual and institutional characteristics. Furthermore, its role in the standardization of procedures and nomenclature necessitated a strong degree of cooperation among its member societies and their fields. Because microbiology was a new and applied discipline, researchers were eager and able to cooperate with counterparts from different specialties and fields.

¹⁴ Bates suggests that this was a functional advantage of the AAAS, "the American Association for the Advancement of Science had arisen in response to new and definite needs which it could meet better than any existing organization could hope to do. It could transcend the interests of state and local societies," 76.

¹⁵ George E. Hale, "The International Organization of Scientific Research," International Conciliation no. 154 (1920), 431.

¹⁶ Charles Rosenberg cites another example: "When America's first professional biochemical society was founded in 1906, its charter members were drawn from a variety of contexts: industry, agricultural colleges and experiment stations, university departments of physiology and psychological chemistry as well as medical schools and hospitals." "Toward an Ecology of Knowledge: On Discipline, Context, and History," in The Organization of Knowledge in Modern America, 445.

¹⁷ Bates, 111-3.

However accomplishing such “umbrella” functions was not always an easy administrative task. During its first three decades of existence, the ISM was not structured in a way to encourage activities outside the organization of periodic congresses. It lacked a headquarters, support staff, funding and statutory authority. Although the early incarnations of IUMS were federations of member national societies, there was often little coordination or communication. The ensuing pages are in large part devoted to recounting the efforts of a few individuals who sought to consolidate and expand this organization. Their efforts were infrequently acknowledged and only rarely appreciated. The records of their actions and correspondence reflect a sense of commitment that borders on the heroic. Yet, without these gradual changes, the IUMS would not resemble the successful and active organization of today.

The following six chapters detail the history of the International Union of Microbiological Societies, covering the sixty-three year period between 1927 to 1990. Chapter One provides an account of the foundation of the International Society for Microbiology and the occurrence of the First International Congress for Microbiology. Entitled “The Difficult Years, 1931 - 1939,” Chapter Two recounts the aborted attempt to host the Second International Congress for Microbiology in Berlin in 1933, and then records the substitute London Congress, as well as the Third Congress in New York in 1939. The first glimpses of an international microbiological society that was active outside the periodic international congresses are found in Chapter Three: “Expansion and Integration.” Chapter Four deals with the period between 1953 to 1962, and suggests that this was era of “consolidation,” while Chapter Five deals with the ensuing decade of increased activity, 1963-1971. The historical account ends with Chapter Six: “Decentralization and Diversification,” and describes the events from 1971 to 1987. This volume concludes with a review of past and future functions of international microbiology, and suggests that many of the current IUMS goals have deeply rooted historical precedents.

CHAPTER 1 FOUNDATION

The International Union of Microbiology Societies was founded over 60 years ago. Prior to 1930, research results in microbiology and bacteriology were the province of the Permanent Committee of the Congresses of Hygiene and Demography, an organization that held fifteen international congresses spanning a forty year period. These meetings achieved considerable status and attracted a variety of researchers with diverse interests. The Permanent Committee was primarily concerned with practical aspects of public health and sanitation. Moreover, it directed a portion of its efforts to the compiling and reporting of health related demographical statistics, such as infant mortality rates and occupational accidents. The Fifteenth Congress, held in September of 1912, was the last of such meetings as the Great War disrupted these efforts.¹⁸ Following the war there was little interest in reviving this international organization in its previous form.

A Section on Hygienic Microbiology had been part of the International Congresses for Hygiene and Demography for several years. However, the addition of microbiology to an organization concerned with social and physical hygiene created an unmanageable framework. "The main portion of these international congresses, despite the fact that microbiology was growing in importance from day to day, was taken up by hygiene."¹⁹ During the first two decades of the twentieth century, social and physical hygiene focused on such issues as the construction of clean public baths and sewage systems, the development of sanitary food preparations and packaging, and the promotion of such personal hygiene practices as frequent handwashing. However, at these Congresses of Hygiene and Demography the papers of microbiologists and epidemiologists attracted greater attention than even the most pressing physical hygiene issues.

Evidence of the disjointed nature of the Congresses is seen in the resolutions proposed by the Fifteenth Congress. On the one hand, the resolutions concerning the improvement of public baths, reduction of fatigue caused by work, and the official reporting of those afflicted by occupational diseases continued the traditional aims of the International Congresses for Hygiene and Demography. On the other hand, there was a good deal of support for the resolution that "an international committee be appointed to consider the methods of investigation, classification and differentiation of the organisms of the colon-typhoid group, with the view of securing greater uniformity in such methods . . ." Another resolution proposed "that the disinfectants used in different countries should be controlled by a simple bacterial test capable of being easily effected

¹⁸ Much of following few pages is based on recollections of Rudolf Krauss, "Historische Daten uber die Brundung der Internationalen Gesellschaft fur Microbiologie und den Ersten internationalen Kongress fur Microbiology," unpublished manuscript (1931) [TMs], 3 pp., trans Ted Crump. The article is excerpted by H.P.R. Seeliger und G. Linzenmeier in, "Historical Data on the Formation of the Interantional Society for Microbiology and the First International Congress for Microbiology," *Forum Microbiology* 5 (1982): 60.

¹⁹ Rudolf Kraus, "Historical Data on the Foundation of the International Association of Microbiologists and the First International Congress for Microbiology, 1931." TMs [photocopy, trans. from German].

... ,20

The rise of microbiology as a distinct discipline warranted its separation from the Congresses of Hygiene and Demography. By the 1920's, the medical world had witnessed three decades of success from researchers continuing the tradition of Pasteur and Koch. The creation of the International Society for Microbiology (ISM) was the product of extended efforts by a few individuals sharing a common motivation. These men were part of a growing community of researchers studying medical, agricultural and industrial phenomena from a microbiological perspective. This community was concerned not only with finding immediate practical solutions to medical diseases, but also uncovering the underlying mechanisms that might explain the very nature of health, sickness, and medical treatments. The founders of the International Society for Microbiology shared the firm conviction that only through the systematic exchange of findings and methods could the benefits of microbiology be truly realized.

The key figure in the creation of the ISM was a comparatively young French bacteriologist, R. Dujarric de la Rivière. After his training at the Pasteur Institute in Paris, Dujarric spent over a decade working and visiting laboratories in Europe and the United States. He adopted the tradition of Pasteurians who were strongly encouraged to collaborate with foreign scientists. Since the 1890's microbiology had the unique distinction of being a field dominated by such joint ventures, often among scientists of diverse nationalities and training. The international nature of bacteriology had been firmly established during the first decade of the twentieth century when the French cellular and German humoral theories of immunology had been shown to be compatible.

In an unpublished memoir written in the latter years of his life, Dujarric de la Rivière described his initial impetus for forming an international organization. In his own words:

Dans les laboratoires d'armée où j'avais travaillé pendant la guerre, la technique pasteurienne m'avait permis de pratiquer des milliers d'examens. Mais je me rendis compte que désormais il ne suffirait plus d'ensemencer de la gelose our des milieux plus or moins compliques et étudier les microbes a l'aide de réactions plus or moins précieuses. Il fallait imaginer d'autre méthodes, orienter autrement les recherches car on se trouvait devant un mur. Un collaboration international pouvait ouvrir des horizons nouveaux. Il devenait donc indispensable de faciliter les relations entre les microbiologistes en créant une Société International de Microbiologie.²¹

In the early 1920's Dujarric had worked with typhoid and cholera researcher Richard Pfeiffer in Breslau, immunologist Martin Hahn in Berlin, and bacteriologist Rudolf Kraus in Vienna. Pfeiffer, Hahn and Kraus directed reasonably large laboratories and all responded

²⁰ 15th International Congress for Hygiene and Demography; Sept 23-28, 1912, Transactions of the Permanent International Commission, Vol. 1, pp.102-4.

²¹ [In the laboratories of the army where I had worked during the war, the Pasteurian technique had permitted me to practice thousands of exams. But I had realized that from now on it was no longer sufficient to culture with gelose or the more or less complex media and study the microbes with the aid of reactions that were more or less precise. There had to be another method, oriented in another way or the researcher would find himself in front of a wall. An international collaboration would be able to open up new horizons. It became therefore indispensable to create an International Society of Microbiology.] R. Dujarric de la Rivière, "Historique de la Société Internationale de Microbiologie." TD [photocopy], trans. E. Kupferberg.

favorably to Dujarric's idea of an international society for microbiology. Kraus was especially enthusiastic and pledged his support for the project. In retrospect, it is important to note that Dujarric was a man of substantial administrative savvy and unending enthusiasm. In a relatively short period of time, he was able to rouse a lively interest among those who would be able to found a major international organization. His early connections with the Pasteur Institute and other major laboratories undoubtedly aided his efforts, but his impressive network of personal ties was largely instrumental in enlisting the support of the most noteworthy scientists.

In 1926 Dujarric encouraged Rudolf Kraus, the Austrian immunologist who discovered bacterial precipitin, to write to the President of the Committee of Hygiene of the League of Nations, Thorvald Madsen. During the previous two years, Kraus and Dujarric had solicited support for their conception of an international microbiological society. Kraus had found the microbiological societies in several countries attracted by this idea. For some time Kraus had been concerned that microbiology had attained a productive level beyond what the available journals could accommodate. He was able to convince the national societies that this international organization was one mechanism to disseminate and promote findings not easily found in the scientific literature. Moreover, Kraus had gained the support of three eminent figures: Seraphino Belfanti from the Italian Institute for Serotherapy; Emilé Roux, director of the Pasteur Institute; and Simon Flexner, who was in 1926 the head of the Rockefeller Institute. Kraus's letter to Madsen confidently indicated that "if Flexner, Roux, Belfanti and I take the initiative, then I am convinced that we shall succeed in founding such a society which will certainly prove of great value for the future."²²

Once Madsen lent his approval to their efforts, Dujarric and Kraus sought further support at the International Conference on Rabies at the Pasteur Institute in Paris, held between April 25 and 30, 1927 under the auspices of the Committee on Hygiene of the League of Nations. The conference represented the first reconciliation of French and German scientists since the war, and there was a strong affinity toward mutual cooperation expressed in the scientific discussions and ceremonial speeches. Encouraged by this scientific rapprochement on French soil, Kraus, Madsen and Hahn initiated a discussion on the possibility of an International Society for Microbiology.

A preliminary meeting was held at Dujarric de la Rivière's house in Paris. Kraus and Hahn spoke on behalf of the plan. After the initial discussion with the more renowned microbiologists present at the conference, Kraus found that delegates from all nations represented there "expressed themselves unanimously in favor of immediate realization of the idea."²³ Consequently, under the chairmanship of Madsen, the International Society for Microbiology was founded with Jules Bordet elected as President. Bordet, who was not present during the election, was informed by letter of his unanimous nomination. A Nobel laureate for his work in serology, Bordet was chosen for his stature and ability to rally international scientific interest from his position as director of the Pasteur Institute in Brussels.

By the end of 1928, thirty nations were incorporated into the society and work began toward the First International Congress for Microbiology. Preparations for this congress were

²² H.P.R. Seeliger and F. Linzenhenmeier, "Historical Data on the Formation of the International Society for Microbiology and the First International Congress for Microbiology", *Forum Mikrobiologie* 5 (1982): 60.

²³ Kraus, 2.

taken up by the General Secretary, Rudolf Kraus, and the three secretaries assigned to him to handle communications in German, French and English: German professor Eduard Gildemeister; then Director of Laboratories for the Pasteur Institute in Paris, Dujarric de la Rivière; and Harry Plotz, an American working at the same Pasteur Institute. Jules Bordet assumed responsibility for formulation of the bylaws.

Ironically, Kraus was forced to end his immediate involvement with the preparations when he accepted a new position as Director of the Bacteriological Institute in Santiago, Chile. Consequently, Dujarric assumed Kraus's position as General Secretary and worked to prepare for a congress by late 1929. However, no immediate date could be agreed upon and the first congress was not scheduled until July 1930, at the Pasteur Institute in Paris. During the final few months before the congress, Jules Bordet left Brussels to direct Dujarric's efforts in Paris. Professor L. Martin facilitated their administrative efforts by providing an unused ward of the Pasteur Hospital for a make shift office. (The ward was in the process of being restored, and could not therefore accept patients.)

In a published memoir entitled "Souvenirs," Dujarric recounts the work preparing for the Congress. He described the bureaucratic and administrative work as "intense" for several months. Dujarric recalled his close working relationship with Bordet that would earn the Belgian the title "mon cher Maitre" in all of Dujarric's notes. "In working with him, I had learned to know better his magnificent clarity of spirit and I had conceived, for him, a profound admiration and at the same time an affectionate respect."²⁴

Bordet was extremely influential in the construction of the society and its aims. In his drafting of the statutes, Bordet sent a letter to Kraus and Dujarric informing them of his insistence that the first article contain the following "pacifist text":
It is an International Society of Microbiology, created not only for the favorable production of science and the creation of more close relations among the diverse countries collaborating, but also affirms the uniform conviction of its members that the sciences united the nations in an ideal of inalterable peace and constant solidarity.²⁵

Bordet and his Belgian colleagues maintained that their involvement as an internationally neutral country demanded the inclusion of the passage.

Bordet strove to guarantee that the Society would not be dominated by the French and German microbiologists. Within Article III was the provision that the same nation not have more than three members on the central commission. Every nation that had a national society for microbiology could elect a representative member that would serve as a founding member and vice-president of the society. Bordet also chose to accept five languages for official documents: French, German, English, Spanish and Italian. (The statutes specified that the language of the host country of any congress would also be temporarily added to the list.)

Finally, in order to establish legitimacy as a representative international organization for all fields of microbiology, Bordet placed the new society under the patronage and support of the Honorary Members: director of the Pasteur Institute Emilé Roux; Richard Pfeiffer; British typhoid researcher Sir Almroth Wright; Alexandre Yersin, the French discover of diphtheria

²⁴ R. Dujarric de la Rivière, *Souvenirs* (Paris: Pierre Fanclac, ?), 168. Trans. E. Kupferberg.

²⁵ Jules Bordet, Brussels to Rudolf Kraus, Vienna, 19 September 1928.

toxin; and Russian soil bacteriologist Sergei Winogradsky. This list contained the preeminent living researchers at that time and fulfilled Bordet's intentions that "It will not only compose of the Science of Bacteriology but all the sciences associated with Microbiology: Parasitology, Medical, Veterinary and Agricultural Microbiology, etc."

The First International Congress for Microbiology was an unqualified success. The thorough preparatory work of Dujarric and Bordet allowed the five day conference to proceed without significant administrative difficulties. The substance of the meetings had exceeded even the high expectations of Dujarric. Nearly all of the invited scientists chose to attend, and many presented unpublished material. The International Society for Microbiology was able to publish both a monograph of abstracts and a separate two-volume Proceedings consisting of papers, demonstrations, and communications.²⁶

In the preface of the Proceedings, Dujarric highlighted some of the more significant accomplishments of the Congress: Scientific problems of great theoretical and practical interest were discussed. Recent discoveries concerning the etiology, prophylaxis and treatment of scarlet fever; new knowledge on cholera, modern methods of tissue and tumour cultures, actual problems of veterinary medicine, such as epizootic abortion, study of blood spirochaetosis, and finally, biological problems of general interest, such as the phenomena of bacteriophage, blood groups, and the problem of plant immunity, have been approached in turn by the most qualified investigators.²⁷

Of greater interest were the general lectures on tuberculosis and diphtheria vaccinations, immunity in syphilis and on soil bacteriology. By publishing and mailing lengthy abstracts three months prior to the opening of the congress, Dujarric enhanced the critical discussions that occurred during each session.

The opening ceremonies of the First Congress were held on the morning of July 21, 1930, in the Grand Auditorium of the Pasteur Institute. Although no list of participants was kept, well over a hundred microbiologists attended, including the forty-seven "founding members." The opening assembly featured thirty opening remarks by foreign delegates, followed by a procession to Pasteur's tomb in the Institute's chapel.

The first address was delivered by the President of Honor, Director of the Pasteur Institute, Emile Roux. Although his brief allocution appears in the published proceedings without comment, the elderly Roux was too ill to deliver the speech himself. Assistant Director Calmette read Roux's statement which emphasized the elder Pasteurian's conviction that "above all of the other sciences, microbiology is capable of uniting the nations in an ideal of inalterable peace and constant solidarity."²⁸

As Effective President of the International Society for Microbiology, Jules Bordet delivered the second speech. His lengthy address eloquently expressed the sentiments of the Society's founders. Bordet claimed that the Congress was a "response to a necessity" for a

²⁶ Société International de Microbiologie. *Résumés de Rapports, Conférences et Démonstrations, Première Congrès International de Microbiologie*, Rivière, R. Dujarric de la., Gildemeister et Harry Plotz. *Première Congrès International de Microbiologie, Paris 1930*. (Paris: Masson, 1931).

²⁷ de la Rivière, R. Dujarric. *Première Congrès International de Microbiologie*, tome I, xii.

²⁸ Ibid, 5.

periodic international exchange of findings in microbiology. The Belgian serologist noted that the Society was intended for the promotion of both practical and theoretical efforts, insisting that work in the former would inevitably flow from the latter. As examples, Bordet noted the recent successes in the treatment of rabies and yellow fever and directed the attention of the Congress to the more elusive problems of antibody specificity and filterable viruses.

Bordet did not hesitate to emphasize the international nature of the organization and its lofty moral aims. He expressed his firm belief that the humanitarian nature of microbiology could comprise the basis for bonds that would transcend the traditional economic and political motivations for war.

During the ghastly period that we have traversed, while other sciences lent to the task of destruction, it is this one, ours, that . . . remained nevertheless still capable of dedication and of kindness. More than all other sciences, ours can be a persuasive force that preaches to men the mutual aid and the concord.²⁹

With the renewed collaboration among French and German microbiologists, Bordet suggested “perhaps it will be convenient between the Institutes of different countries to exchange young workers.”³⁰

Lastly, Bordet delineated the need for cooperative bibliographical efforts. Sarafino Belfanti, head of the Italian delegation, published a bulletin of abstracts and short papers. The bulletin aimed to condense and disseminate comprehensively the work of Italian scientists. Ironically, Belfanti chose to publish the journal in French rather than Italian. Bordet heralded these efforts and suggested that each national microbiological committee might be able to produce a similar bulletin. There was also a brief mention that the International Society for Microbiology would attempt to produce an international bulletin with similar aims.

The sessions of the Congress were divided into four sections: 1) general microbiology, medical and veterinary, 2) serology and immunology, 3) agricultural microbiology, and 4) protozoology and parasitology. These sections held simultaneous conferences for much of each day, with a new topic as the focus of each conference. For example, the section on immunity and serology considered lipoids in immunity on Monday, tissue cultures and tumors on Tuesday, and blood groups on Wednesday. A single session consisted of two or more full papers with several short “communications” read. The published reports included a few select remarks made during the discussions.

The structure of the Congress did not always encourage such a disciplined separation among the four sections. Several demonstrations of laboratory techniques were shown to two or more sections simultaneously. Moreover, the full Congress reconvened for six general lectures directed toward such topics as immunity in parasite diseases, anti-diphtheria vaccination, and soil analysis.

The most controversial presentation was given by the Assistant Director of the Pasteur Institute, Albert Calmette. Professor Calmette had developed jointly with Camille Guerin a seemingly effective anti-tuberculosis vaccine, B.C.G. (from “bacillus,” “Calmette,” and “Guérin”). The vaccine had come into widespread use in the 1920's and in July, 1929, Calmette

²⁹ Première Congrès International de Microbiologie. Tome 1., 11. (Trans. Eric Kupferberg)

³⁰ *Ibid*, 12.

sent a culture of B.C.G. to the director of the Public Health Laboratories of Lubeck, Germany. The head of the city's bacteriological laboratory prepared the vaccine, which was put to use at the end of the year. Within a few short months, seventy-one out of the two-hundred and fifty-two children vaccinated had died from tuberculosis infection caused by the organism used as vaccine. United States delegate and President of the Society of American Bacteriologists Alice Evans recounts the circumstances surrounding the memorable discussion:

Inoculation with B.C.G. had been under fire in both scientific and lay circles all over the world following the death of large number of German babies who had received inoculations with vaccine obtained from the Pasteur Institute. The Lubeck tragedies had occurred in the summer of 1930, not long before the Congress met, and the Germans had accused the Pasteur Institute of having sent contaminated vaccine to Lubeck.³¹

The public reaction was no less than violent. Calmette and his division of the Pasteur Institute were attacked in the press and ridiculed in public letters, songs and cartoons. While several German researchers familiar with the B.C.G. technique rushed to Calmette's defense, the cause of the seventy-one deaths remained undetermined at the time of the Congress.

Calmette declared that there was no danger of non-virulent vaccine becoming virulent when administered to human beings. In an impressive display of epidemiological statistics from five countries, Calmette insisted that there was not a single case of active tuberculosis being developed in any of the 258,000 inoculated infants. He suggested that the "unhappy drama of Lubeck" was the product of an accidental substitution of virulent vaccine for the Pasteur product of non-virulent B.C.G.

While Calmette's defense elicited round after round of applause, not every immunologist was convinced. The controversy resurfaced during the next two days with non-German delegates attacking the B.C.G. vaccine. Dr. S.A. Petroff of the American Trudeau Sanitarium contended in the Thursday session that the bacilli of the vaccine may become virulent under certain conditions. William Park of the New York City Board of Health voiced a contrary American opinion in his description of the promising results obtained with B.C.G. vaccine in New York City.

When the subject arose yet again on Friday, Jules Bordet interrupted the program in defense of Calmette. In addition to refuting Petroff's claims of possible virulence, Bordet indicated that he had just received a communication of "superior German authority" reporting that the tragedy was due to an accidental contamination of the vaccine sent to Lubeck. The Congress took no definitive action of the issue, and only a handful of the doubters had been convinced of the worth of B.C.G. Two years after the closing of the Congress a tribunal in Lubeck correctly placed blame on the directors of the German laboratory for the virulent vaccine and sentenced two Lubeck microbiologists to twenty-year prison terms.

The First International Congress of Microbiology took several actions to establish the continuation of the International Society for Microbiology as a permanent organization. The Statutes Committee adopted the provisions drafted by Bordet and agreed that the organization would fix its headquarters in Brussels and seek codification of the statutes under Belgian law. The Society would be composed of the founding members, elected officials and official

³¹ Alice C. Evans, "First International Congress of Microbiology--Anecdotes." Unpublished memoirs, 18.

delegates from the national societies for microbiology. Those countries without such societies were encouraged to form them and were invited to join as vice presidents of the ISM. The president of the society would be the president of the national society hosting the next congress. The German delegation extended an offer to host the Second Congress in 1933 in honor of Robert Koch; thus, German bacteriologist Martin Hahn became the society's President-Elect.

The International Society for Microbiology also provided for a Permanent Commission on Bacterial Nomenclature. By the mid-1920's bacterial nomenclature had reached a state of near chaos. The nomenclatural codes of the International Congress of Botany and Zoology did not provide adequate provisions for the naming of microorganisms, and the Bergey's Manual of Determinative Bacteriology proved unable to provide a means of establishing proper criteria for integrating new findings. The ISM made "possible for the first time adequate international cooperation relative to certain problems of microbial nomenclature."³² The commission was initially composed of over fifty members from thirty countries, representing all spheres of bacteriology. From that commission, a special Nomenclature Committee was chosen with the authority to:

. . . consider, among others: problems such as criteria to be employed in classification, adoption of names for species and genera conservanda, type species, including their identification and preservation, the encouragement of monographing of special groups or genera of bacteria by those best qualified to do the work; the enlargement of the scope and usefulness of the various type culture collections by more adequate support; and the preparation and publication of such Committee reports.³³

The reports of the bacterial nomenclature committee were to be approved by the ensuing Congress and submitted to the appropriate sections of the International Botanical Congress. Fearful that it lacked the immediate legislative legitimacy, the Nomenclature Committee was hesitant in its resolutions during the First International Congress for Microbiology, limiting its efforts to establishing financial support for type culture collection efforts. The importance of bacterial classification became a more significant focus of the International Society for Microbiology during the Second and Third Congresses.

The character of the First Congress was very much the product of Dujarric de la Rivière's efforts. While he presented neither a paper nor a presentation, his bureaucratic skills and social savvy guaranteed that the participants of the First Congress would remember fondly their week at the Pasteur Institute. Dujarric personally paid for the bronze medallion of Pasteur distributed to some of the delegates. He entertained delegates at a reception in his home which rivaled the quality of the official banquet. In a letter to Bordet nine months after the closing ceremonies, Dujarric explained that he was only able to raise 60,000 out of the 125,000 francs necessary to cover the cost of printing both volumes of the Proceedings. Dujarric was a wealthy man and presumably paid for the remainder of the bill.

It is difficult to explain fully Dujarric's dedication to the creation of the International Society for Microbiology. For five years he devoted endless time and money to the birth of an international organization with an uncertain future. Dujarric was the key advocate for creating

³² Première Congrès de Microbiologie, tome II, 525.

³³ *Ibid*, 526.

an International Bulletin for Microbiology--modeled after the bulletin produced by the Italian National Society. After the First Congress, Dujarric had already drawn the cover and received a few articles for the first issue of the trilingual bulletin. Unfortunately, Dujarric did not find sufficient support for the bulletin, especially among his fellow French microbiologists. His international journal never became a reality. In recognition of Dujarric de la Rivière's contributions, he was named Honorary Secretary-General at the Fourth Congress.

The International Society for Microbiology achieved legal status on June 3, 1931. Then Past-President Jules Bordet had incorporated (Personification Civile) the society in Brussels and the statutes received the signatures of King Albert of Belgium and M. Janson, Minister of Justice.³⁴ Within a year, the International Society for Microbiology recognized thirty national societies, and was occupied with planning for the Second Congress in Berlin. Although the next few congresses maintained the high level of scientific prestige, each suffered significant bureaucratic and political setbacks. The administrative talents of Dujarric and the favorable political climate of July, 1930 would be deeply missed.

³⁴ The statutes were published in Moniteur Belge, Journal Officiel, vol. 101. #165, June 14th, 1931.

CHAPTER 2 THE DIFFICULT YEARS, 1931-1939

The founders had hoped that microbiology would somehow transcend the national economies and politics. Bordet and others understood that the number of lives saved by the techniques of science could be vastly overshadowed by the lives lost to the politics of war and hatred. It is tragic to think that the driving motivation in founding the International Society for Microbiology, “that Science should unite the Nations in an ideal of durable peace and constant solidarity,” would for a decade prove to be cruel irony.

The Second International Congress for Microbiology was scheduled for Berlin in 1933.³⁵ The planning for the congress was left in the hands of the Permanent Committee and the Central Committee. The statutes of the International Society for Microbiology provided for the membership of each. The Permanent Committee consisted of the immediate past-president, secretary-general and treasurer of the previous congress (Jules Bordet, Dujarric de la Rivière and George Masson respectively), the president of the next Congress (Martin Hahn), and the presidents of the National Societies (Belfanti, Italy; Flexner, USA; Ledingham, England; Murillo, Spain). In 1931, the Central Committee was composed of Martin Hahn, the two vice-presidents of the German National Society, Fred Neufeld and E. Fullerborn, and three appointed secretaries. For convenience, Hahn chose to retain the three secretaries from the First Congress, Dujarric, Gildemeister and Plotz.

Unfortunately, even the best laid plans by the new President, Martin Hahn, went awry. By December 1932, Hahn had informed both Committees that the “world economic situation” would require the Berlin Congress to be postponed until 1934. Furthermore, Hahn was facing a crisis of his own. Although Hahn was a Christian by birth and had served in the Germany Army Medical Corps during World War I, he was of Semitic descent. With Hitler's rise to power in 1933, Hahn found himself increasingly under suspicion. He resigned his post as President of the German National Society for Microbiology, and with it relinquished his duties as President of the International Society for Microbiology and of the Second Congress. In a series of letters to Jules Bordet, Hahn poignantly explained the circumstances of his resignation, “I could not resist in the long run. The pressure which was carried out in a more or less open way from the side of the government as well from my German colleagues (and most certainly through Mr. Gildemeister), endangered my position in Germany.”³⁶

Hahn chose to leave the country that summer, and in the face of increasing university difficulties, retired that Fall at the age of sixty-eight. Meanwhile, Gildemeister informed the Permanent Committee that the German government would not grant the subsidy for the Congress in 1934 and therefore the Congress would be postponed until 1935.

Bordet communicated to Hahn his shock that the German intellectuals would participate

³⁵ A portion narrative in this chapter is loosely based on work of Norman E. Gibbons, “History of the International Association of Microbiological Societies,” *ASM News* 40 (1974): 419; and H.P.R. Seeliger, “60 Years of International Organization of Microbiological Societies,” unpublished manuscript, 3 pages [TMs].

³⁶ Martin Hahn, Karlsbad, to Jules Bordet, Brussels, 6 June 1933, [translated by H. Seeliger].

so actively in the anti-Semitic movement. In an attempt to retain Hahn as President of the Second Congress, Bordet offered to circulate a letter signed by eminent German and Non-German scientists. Hahn replied “such a letter would be only welcome by me . . . as a sign of confidence expressed in me. But first . . . I would not like to risk unpleasant matters and hardship under the present circumstances in Germany, and secondly I do not think that the German members would sign such a letter.”³⁷

Bordet maintained with his hope that the Second Congress might take place as planned. This time Hahn's reply was more frank. Writing from Karlsbad, Hahn indicated that “the fact that I was forced to resign from the presidium, proves after all, that the Israelis and their descendants will not be equally treated” if the Congress were to occur under the auspices of the German National Committee. As to the lack of concern among German Microbiologists toward his situation, Hahn insisted that “the affair does not seem to be important enough to them to risk custody and loss of their position, and above all they are mostly older people without personal influence.”³⁸ In July of 1933, Hahn left for South America reminding Bordet not to send confidential information by mail.

The Permanent Committee was placed in a quandary. Under the Statutes of the International Society for Microbiology, if the President resigns office, the National Committee of the host country for the next congress appoints another President. In the immediate months following Hahn's resignation, neither Bordet nor any other member of the Permanent Committee received notice from the German National Committee. The Vice-Presidents of the German National Committee were Fred Neufeld and E. Fullerborn. The former, like Hahn, lost his official post, while the latter died during the previous year.

Technically, Gildemeister could have appointed a new President and the Permanent Committee would have had no choice but to risk holding the Second Congress in the midst of the anti-Jewish crusade. Bordet chose to consult with Nomenclature Committee chairman John C.G. Ledingham of the Lister Institute. Ledingham proposed that Bordet recommend privately to Gildemeister that “the German National Committee should voluntarily resign its right to nominate a new President.” While Ledingham urged Bordet to move the Congress to a neutral country, both men understood that the matter could not be seriously considered until the Germans definitely abrogated their rights to the Permanent Committee. “We must avoid any high-handed action nowadays,” Ledingham warned.³⁹

Bordet heeded Ledingham's suggestions. Two letters were sent to Gildemeister. The first was a brief, formal announcement from the Permanent Committee:
As I am informed that Professor Hahn has resigned from the position of President of the Next Congress of the International Society of Microbiology, will you be good enough to inform me whether your National Committee wishes to submit to the Permanent Commission another name in his place. Should your National Committee prefer to abrogate your privilege of nominating a President for the Congress in Berlin in 1934, would you inform me at the very earliest so that steps may be taken by the Permanent Commission to arrange a Congress elsewhere whether in 1934 or 1935.

³⁷ Martin Hahn, Karlsbad, to Jules Bordet, Brussels, 12 June 1933, [translated by H. Seeliger].

³⁸ Martin Hahn, Karlsbad, to Jules Bordet, Brussels, 17 June 1933, [translated by E. Kupferberg].

³⁹ John C.G. Ledingham, London, to Jules Bordet, Brussels, 2 December 1933.

The second was a “Confidential” letter imploring Gildemeister to allow the Second Congress to take place outside of German Soil.

Should your National Committee decide to submit another President for a Congress in Germany in 1934 or perhaps 1935, it is only right that I should warn you that such a Congress is not likely to be international in character. The fact that Professor Hahn has resigned from the Presidency of an International Society in deference to purely local political considerations, is, you will admit, in serious conflict with the spirit of the first paragraph of Article I of the Statutes of the Society, which lay down the Name, *Ziel und Verfassung der Gesellschaft*. My advice to you and your National Committee is that you should abrogate your right to the Permanent Commission so that other arrangements may be made for maintaining the work and continuity of the Congress.⁴⁰

Apparently, Gildemeister and the German National Committee made no reply. Meanwhile, in the last days of 1933, Bordet received a letter from Paul Zolzadowski of the Russian National Society offering to host the Second Congress in Leningrad for 1935. In order to make use of the preparations for the Berlin Conference, there was even some consideration of inviting Hahn to serve as President.⁴¹ A month later, Gildemeister wired Bordet a short message informing the Permanent Committee that the German National Committee had withdrawn from the ISM altogether.

It is not surprising to find that Ledingham and Bordet turned to Dujarric de la Rivière for advice. Ledingham reported that the National Committee of Great Britain and Northern Ireland extended an invitation to host the Second Congress at the Lister Institute in 1935. Dujarric suggested that the Permanent Committee accept this offer, believing that the well-established Lister Institute of Preventive Medicine in London would command more respect than the Institute of Experimental Medicine in Leningrad. To ensure adequate time for preparations, the date of the Congress was moved to 1936.

A new Executive Committee was created and composed of eleven members of the National Society of Britain and Ireland. Ledingham was chosen as its chairman and Ralph St. John-Brooks as its secretary. The Executive Committee, which held its first meeting in the Fall of 1934, drafted a provisional program defining the scientific content of the Congress. The scope of the Congress was divided into eight sections:

- 1) General Biology of Micro-organisms
- 2) Viruses and Virus Diseases in Animals and Plants
- 3) Bacteria and Fungi in Relation to Disease in Man, Animals, and Plants
- 4) Economic Bacteriology: Soil, Dairying and Industrial Microbiology
- 5) Medical, Veterinary and Agricultural Zoology and Parasitology
- 6) Serology and Immunochemistry
- 7) Microbiological Chemistry

⁴⁰ Jules Bordet, Brussels, to E. Gildemeister, Berlin, December 1933.

⁴¹ Hahn had drafted a preliminary program for the Berlin Congress and had begun selecting section chairmen for the following topics: 1) predisposition in tuberculosis, 2) tularemia, 3) the importance of the culture of tissues for microbiology, 5) carbohydrates as antigens, 6) subject from biochemistry, 7) research work in connection with intestinal worms, and 8) symbiosis.

8) Specific Immunization in the Control of Human and Animal Disease

The organization of these sections was entrusted to sectional conveners, who were members of the Executive Committee with special knowledge of the various subjects. The conveners were empowered to appoint sectional leaders, who in turn selected speakers and solicited papers. It is no coincidence that the Second Congress was characterized by an increased emphasis on the practical applications of microbiology. Unlike the First Congress, the London Congress was partially financed by corporate and governmental donations. Moreover, Ledingham and the other organizers (many from the Lister Institute) were long-time proponents of the applied aspects of microbiology.

The Second International Congress for Microbiology began July 25th, 1936 amid substantial attention and support from the British Government. When the Congress opened in the Great Hall of University College, messages were delivered from King Edward VIII and the Duke of Kent, the Patron of the Congress. The Rt. Hon. J. Ramsay MacDonald, Lord President of the Council, conducted the Opening Ceremony, receiving officers and the official government delegates and formally declaring the Congress open.⁴² The Presidents of Honor then presented short allocutions followed by Ledingham's presidential address.

Speaking in French, the immediate Past-President, Jules Bordet highlighted some of the recent significant developments in microbiology in the period between Congresses. As he had done in his oration before the Paris Congress, Bordet reiterated the challenge of determining the specificity of antigen-antibody reactions. However, Bordet was alone in his call for such "pure" microbiological research as the theme of the Second Congress was of a more applied nature.

The ensuing address, presented by British veterinarian Sir John MacFadyean, discussed the need to eradicate bovine tuberculosis, a disease transmittable to humans through cows milk: The principal obstacles to eradication appear to be expense, and apathy on the part of the public. These difficulties have always arisen in connection with efforts to stamp out contagious diseases of animals that are not rapidly fatal, and in the present case the greater of them is apathy.⁴³

In order to overcome these obstacles, MacFadyean called for increased government supervision of the dairying industry as well as heightened public awareness of health issues. Scottish bacteriologist Sir Robert Muir outlined microbiology's impact on scope of medical education. Citing the high incidence of malaria in the greater part of the British Empire, Cambridge professor George H.F. Nuttall reminded those at the Congress of the pressing need for cost-effective substitutes for Quinine.

It is not surprising that Ledingham's presidential address emphasized the economic and public health interests of microbiology. Ledingham served on innumerable governmental committees including the Medical Research Council, the Ministry of Health, the British Empire Cancer Campaign and the Bureau of Hygiene. As the *British Journal of Pathology* and

⁴² The governmental ties to science had been well-established in Britain. In appreciation of His Majesty's Government's interest in microbiology, Thorvald Madsen, a Vice-President of the Congress and former director of the Health Section of the League of Nations, mentioned in the activities of the Medical Research Council, the Department of Scientific and Industrial Research and the Agricultural Research Council.

⁴³ John MacFadyean, President of Honor Address, *The Second International Congress for Microbiology*, London, 25 July-1 August, 1936, Report of the Proceedings, ed. Ralph St. John-Brooks (London: Harrison & Sons, 1937), 16.

Bacteriology eulogized in 1944:

Ledingham, as was natural for one who had spent his working life in an Institute founded with the object of furthering the application of newly won knowledge to the practical problems of preventive medicine, took an active interest in the wider aspects of experimental medication in its relation to the public health. In 1925, he gave an address in which he stated his views on the position of bacteriology in the scheme of public health in Britain and suggested the training of a widespread cadre of bacteriologists for routing duties and research studies throughout the country.⁴⁴

In the years immediately prior to the Second Congress, Ledingham, while President of the British National Committee for Microbiology, strongly advocated widespread vaccinations for smallpox, alastrim, measles, scarlet fever and whooping cough. Insisting that Britain lagged behind other European countries in these measures, Ledingham “did not conceal his impatience with the tardy adoption of the well tried methods by the authorities and with the lack of adequate means for enlightening those who are responsible for child welfare . . .”⁴⁵ Ledingham was a perennial proponent of measures to provide clean and safe milk for the entire population and served on the activist Safe Milk Committee of the People's League of Health.

Additionally, the Presidential Address heralded other fundamental changes in practice of microbiology. Signalling the end of the “Golden Age of Microbiology,” the first generation of disciples of Koch and Pasteur had passed away in the interim between congresses (*e.g.*, David Bruce, Martinus Beijerinck, Roux, Calmette, William Welch, and Theobald Smith). Moreover, the practice of microbiology had radically changed. In Ledingham's own words: The last two decades have witnessed, however, a still more intensive attack on the bacterial stronghold by biochemists and biophysicists eager to probe more deeply by aid of their special disciplines, into the fundamental of bacterial metabolism and the interactions of germs with the fluids and tissues of their hosts.⁴⁶

The Second Congress featured sections entirely devoted to “immunochemistry” and “microbiological chemistry” as biochemistry was sought to provide the causes and structure of the phenomena central to microbiology. In the opening remarks of the section on immunochemistry, British immunologist William Topley noted:

Within recent years there has been a significant change in our approach to immunological problems. The earlier workers tended to think in terms of diseases, or of bacteria, or of their toxins; today we think in terms of antigens, and antigenic structure. Moreover, we are beginning to know something of the chemical structure of these antigens, or of the antigenic components, and we can, in certain cases at least, assign them particular situations in the bacterial cell.⁴⁷

⁴⁴ G.F. Petrie, “Obituary Notices of Deceased Members: John Charles Grant Ledingham,” Journal of Pathology and Bacteriology 58 (1946), 123.

⁴⁵ *Ibid.*

⁴⁶ Ledingham, Second International Congress for Microbiology, 21.

⁴⁷ William W.C. Topley, “Opener. Discussion on Immunity Reactions in Relation to Antigenic Structure and Variation in Bacteria,” in Second International Congress for Microbiology, 192-3.

The role of international scientific congresses had also changed. Unlike its predecessor, the Second Congress did not feature general lectures, nor did the proceedings publish the full papers. The proliferating number of journals and national societies obviated some of the prior roles of the international meetings as a sole source of information. Rather, the organizers chose to accept a far larger number of papers while printing only their lengthy abstracts. As Ledingham viewed it, the primary function of the Second Congress was to establish personal contact between those working on similar problems. Concerned with the ever increasing trend toward premature publishing, over-claimed discoveries and quick priority claims, Ledingham conceived of a useful role for the modern day international society. That main function is, in my view, to afford an opportunity for experts to compare notes with each other on subjects of mutual interest . . . Only personal contact, otherwise so lacking in these days of strenuous and highly competitive addiction to research, can give the necessary and very desirable corrective to the written word and the unmerited reverence often paid to it.⁴⁸

There is strong evidence that Ledingham's hopes were realized by many participants. For example, Alice Evans, the former president of the Society of American Bacteriologists, recalled in her memoirs that the first two International Congresses for Microbiology provided excellent opportunities for “networking” with other researchers of similar topics. Evans extended the stay of her cross-Atlantic journey in order to visit laboratories of those sharing expertise in Brucellosis, meningococci, and pathogenic streptococci. Years after the London Congress, she continued to correspond with several of these researchers that she met at various social events, noting that these connections enhanced the studies of many involved.⁴⁹

Over one thousand delegates representing sixty-four countries attended the Congress. Each participant was given a congress badge bearing the effigy of Antony van Leeuwenhoek, “the Father of Microbiology.” (Although Leeuwenhoek was not British, the Executive Committee acknowledged his close associations with the Royal Society of London.) Eight-hundred and thirty scientific papers, demonstrations, and openers were presented in the eight sections. While the First Congress restricted its content to new and original material, the contributions to the Second Congress were often summaries of earlier work and served as an overview of the current state of many specialties.

This is not to suggest that the London meeting was without substantial value. Several issues attracted considerable attention from researchers at the forefront of their fields: the preservation of delicate organisms, the specific characteristics of bacteriophages, the biochemical purification of sewage, the mechanisms of drug action and drug resistance, and the control of diphtheria and whooping-cough. British physician Leonard Colebrook announced, for the first time, the efficacy of “prontosil soluble” in the treatment of certain types of human puerperal infection, introducing a new era of chemotherapeutic agents, and later antibiotics. The Nomenclature Committee, while taking little definitive action, considered the bewildering taxonomic chaos of the Salmonella group and adopted resolutions concerning the conservation of Bacillus as a bacterial generic name.

⁴⁸ Ledingham, Second International Congress for Microbiology, 22.

⁴⁹ Alice Evans, “Second International Congress of Microbiology: Anecdotes, 1937 (?)” TMs [photocopy], p. 24-36.

The Plenary Session of the Second International Congress for Microbiology made several sweeping changes. Both the name of the organization and its statutes were revised as several members were disenchanted with the structure of International Society for Microbiology. The official proceedings of the Second Congress contained this cursory explanation:

. . . it was pointed out that the retention of the International Society, at any rate in its present form, was undesirable on the grounds that it had failed, and probably always would fail, to secure the adherence of individuals of all nations from whose enrollment-inscription funds could be built up and retained by its Permanent Commission for the various purposes contemplated in the Paris Statutes. The Society so far had been able to perform only one--and that its most important--function, viz. the securing of the continuity of congresses.⁵⁰

However, neither the proceedings nor the notes or correspondence elaborated. There is no evidence that the Society was financially insolvent, nor was there an apparent consensus to revoke any particular mandate of the Paris Statutes. Yet, the British National Committee suggested that the Society be dissolved and that a Permanent International Commission be established for the sole purpose of organizing triennial International Congresses.

Fortunately, many members of the Permanent Commission opposed such an emasculation of the only international society devoted to microbiology. Most likely, the British National Committee and others were expressing dissatisfaction with the structures that led up to the aborted Berlin Congress. Additionally, many of the National Committees, created in accordance with the ISM's statutes, "had functioned but little, if at all, as international centre of liaison, either with their own national societies or with the Secretary-General's Office in Paris."⁵¹

The Closing Plenary Meeting adopted several additional resolutions. Initially, the name of the International Society for Microbiology (ISM) was changed to The International Association of Microbiologists (IAMB). Secondly, in contrast to the ISM, the International Association would not enroll individuals. Rather, the existing national committees would appoint one member only to act on a Permanent International Commission for the organization of congresses. The President of the last congress would also be, *ex officio*, a member of the Permanent Commission. The President of the Permanent Commission would be the President of the next congress, elected by his own national society. Thirdly, the International Association abandoned the notion of permanent office headquarters, choosing to operate out of the local executive bureau of the country organizing the ensuing congress. The arrangements for the conduct of each congress were to be drawn up by the acting President of the Permanent Commission, and applied to that particular congress only.

While these resolutions did not drastically alter the structure of the international organization, the hope of an creating a society active between and outside of Congresses was abandoned. A small drafting committee consisting of Dujarric, St. John-Brooks, and the American, Thomas M. Rivers, was charged with providing a new set of statutes to be approved at the next congress.

At the close of the Second Congress, Ledingham announced that an invitation to hold the

⁵⁰ "Central International Committee and Permanent Commission of the International Society for Microbiology," Second International Congress for Microbiology, 542.

⁵¹ *Ibid.*

Third International Congress for Microbiology in the United States had been accepted by acclamation. Several members of the Society of American Bacteriologists attempted to persuade Harvard professor Hans Zinsser to accept the presidency of the Third Congress. Although of considerable fame and administrative skill (he was a sectional president at the Second Congress), he would not agree, a fact which drew some disappointment and criticism. The reason for his refusal was evident in Zinsser's autobiography As I Remember Him--he was already aware that he had leukemia.⁵²

In December of 1936, the Society of American Bacteriologists (and its descendant organization the American Society of Microbiologists) elected Thomas M. Rivers, Director of the Rockefeller Institute Medical Hospital, as President of the Third International Congress for Microbiology. Rivers, who was chosen for his outstanding administrative skills, organized and directed an Executive Committee of thirty-plus American scientists to the task of preparing for a Congress in New York for the Summer of 1939. In keeping with the precedent set by the Second Congress, the Executive Committee appointed a convener for each of the tentative eight sections. The convener, in turn, was authorized to appoint sectional committees and their officers, corresponding members, and to solicit papers. Mimicking the scientific content of the London Congress, the following topics were selected for the eight sections:

1. General Biology--Variation and Taxonomy
2. General Biology--Microbiological Chemistry and Physiology
3. Viruses and Viral Diseases
4. Protozoology and Parasitology
5. Fungi and Fungus Diseases
6. Medical and Veterinary Bacteriology
7. Agricultural and Industrial Microbiology
8. Immunology

Owing to the significant interest among American researchers, a section on Rickettsiae and Rickettsial Diseases was added with a determined Zinsser as its convener.

However, unlike the previous congresses, the Executive Committee was responsible for several unique duties. According to the changes in statutes, the IAMB was not composed of individual member scientists, but national microbiological societies. Unfortunately, many countries had not formed such societies--only thirteen National Groups were in association with the IAMB by July of 1937. Additionally, since the statutes did not provide a continued source of funding, the Executive Committee found itself in dire need to solicit sufficient monies. Although the Society of American Bacteriologists underwrote \$2,500 of the expenses, Rivers felt obligated to request personal donations from members of the Executive Committee. Owing to the Committee's choice of the Waldorf-Astoria Hotel for all Congress activities, as well as the expected increase in attendance, Rivers anticipated a considerably greater cost for the Third Congress. By January of 1938, an additional \$2,600 had been raised with legislation before the United States Congress calling for \$10,000 in government appropriations. In the closing months before the Congress, Rivers had secured substantial financial support from related scientific societies and commercial interests. Remarkably, these efforts enabled the registration fee to

⁵² Norman E. Gibbons, "History of the International Association of Microbiological Societies," ASM News 40 (1974), 423.

remain at only \$5.00.

The Third International Congress for Microbiology might have been an unqualified success. Sixteen hundred delegates representing forty-six countries had been registered -- unquestionably the largest group of microbiologists ever assembled. Unfortunately, the international political climate intervened. War was declared on September 3, 1939, the day following the official opening, and nearly half of the foreign delegates were unable to attend or forced to return before the end of the week. In spite of this administrative crisis, the Executive Committee was able to make the necessary substitutions to allow the general program to remain with relatively few exceptions. In the Preface to the Official Proceedings, Rivers echoed the sentiments of Jules Bordet nine years earlier, expressing a desire that somehow scientific concerns would transcend international strife and conflict: "Indeed it may be said that the very tenseness of the political situation served to strengthen the bonds of mutual scientific interest and to emphasize the value of the scientific attitude."⁵³

Approximately one thousand members and guests were present at the official opening and reception held in the Grand Ballroom of the Waldorf-Astoria Hotel. With Rivers presiding, New York City Mayor Fiorello H. La Guardia welcomed the delegates. Rivers read a succinct presidential address in which he mentioned the recent advances in microbial metabolism, crystallization of viruses, and prophylaxis of yellow fever. In his characteristically witty style of speech, La Guardia delivered a lengthy presentation on the role of government support for microbiology. Claiming that the U.S. Federal Government only supported such researchers as Walter Reed and Gorgas in order to facilitate the necessities of a military occupation and the digging of a canal, the Mayor recounted the peculiar origins of the New York Department of Health. La Guardia insisted that the battles of preventive medicine were fought at the local level. While he thanked the community of microbiologists for providing scientific answers to several pressing health concerns, the Mayor reminded the delegates that their help was still required in providing safe milk, producing vaccines and serums, and establishing health clinics.

In addition to the nine sectional sessions, the Third International Congress contained eleven general lectures from distinguished microbiologists. Inasmuch as these were intended to be of wide interest, they were delivered before the entire Congress. The list of speakers was indeed impressive. Rockefeller researcher, and future Nobel laureate, Wendell M. Stanley spoke on the properties of viruses, heralding a "protein theory of life" that promised to link genetics, biochemistry and virology in an effort to uncover the fundamental structure of living organisms. Dutch biochemist Albert J. Kluyver delivered a lengthy discussion on microbial metabolism outlining his belief in the unity of biological metabolism. And, London immunologist J.R. Marrack summarized the current state of research in the protein structure of antibodies.

As for the sectional sessions, over eight hundred papers were presented during the week-long meetings. While the final Proceedings was only able to publish the abstracts of these papers, included were several of the more significant commentaries and discussions from each section. The Nomenclature Committee held three lively meetings during the Congress. Convinced that concrete action was necessary to resolve the bewildering chaos in microbial taxonomy and classifications, the IAMB voted to review American bacteriologist Robert E.

⁵³ Thomas M. Rivers, "Preface", in The Third International Congress for Microbiology. New York, September 2-9, 1939. Report of Proceedings, ed. M. Henry Dawson (Baltimore: Waverly Press, Inc., 1940), xi.

Buchanan's "Proposed International Rules of Bacteriological Nomenclature." While Buchanan's work (and the rest of the Society of American Bacteriologists' Committee on Characterization and Classification) had considerable influence in the United States and Canada, the European community had not fully adopted the scheme outlined in Bergey's Manual of Determinative Bacteriology.⁵⁴ Although the perplexing issues of classification and taxonomy continued to plague the microbiological community for decades, the sanctioning of the basic tenants of the Bergey's Manual helped to direct future discussion. The Nomenclature Committee also acted to resolve the confusion that had arisen by use of generic names shared between bacteriology and protozoology.

The Plenary Session ratified the statutes for the International Association of Microbiologists proposed at the London Congress. These statutes secured only a "loose organization in order to secure continuity of the triennial International Congress for Microbiology."⁵⁵ The one significant addition to the text was a provision to provide for the establishment of the Permanent Committee on Nomenclature independent of the congresses (yet still a part of the organization).

The Congress closed amid uncertainty and speculation as to the future of the IAMB. Although an invitation from Thorvald Madsen and the Danish Government to host the Fourth Congress in Copenhagen in 1942 had been unanimously accepted, few realized that Denmark would be invaded and in no position to hold a international scientific meeting. At least for the time being, microbiology was overshadowed by six years of World War. Bordet's hope that scientific collaboration could somehow unite all men in "inalterable peace and constant solidarity" would have to wait.

⁵⁴ By the time of the Third International Congress for Microbiology, the Bergey's Manual had been through two revisions. The strength of Buchanan's system was that it was the first to employ a wide range of characteristics in classifying microorganisms -- morphological, tinctorial, biochemical and pathogenic.

⁵⁵ "Plenary Session," in Third International Congress for Microbiology, 34.

CHAPTER 3 EXPANSION AND INTEGRATION

The activities of the International Association of Microbiologists were, for the most part, halted during the Second World War. Due to the occupation of Denmark, it was impossible to hold the Fourth International Congress for Microbiology as scheduled in Copenhagen in 1942. However, the IAMB became active again even while the rubble throughout Europe yet to be cleared. Just as the First Congress for Microbiology was shaped by the dual efforts of Bordet and Dujarric, the Fourth Congress bore the mark of its Honorary Secretary, St. John-Brooks, and its President, Thorvald Madsen. A circular letter that followed the official invitation noted: It speaks volumes for the courage and tenacity of our Danish friends and colleagues that immediately after the cessation of hostilities they were prepared to take up the broken thread and to organize the work of the postponed congress so efficiently . . . ⁵⁶

Anticipation of the Copenhagen Congress did more than merely maintain the legacy of international meetings devoted to microbiology, it set in motion a movement that would gradually bring about significant changes in the structure and function of the International Association.

The statutes of the IAMB, ratified at the New York Congress, made provision for the establishment of a Permanent International Commission for the Organization of Congresses with St. John-Brooks (Secretary of the Second Congress and Past-president of the Nomenclature Committee) as its Honorary Secretary. St. John-Brooks' main responsibilities were to keep an up-to-date list of members and to serve as a liaison to the various national societies. In this capacity, he was able to maintain close contact with microbiologists from allied countries and lay provisional plans even in the midst of international conflagration.

But as the Fourth Congress came closer to a reality, several members understood that the IAMB could not function as an completely autonomous body with little permanent organizational structure. In a letter sent to all active national member societies, St. John-Brooks proposed that the International Association be linked and integrated to other international scientific organizations:

The disruption of the scientific contacts brought about by the Second World War has emphasized the desirability, and indeed the necessity, of having not only continuity of secretarial functions between the congresses, which is not specifically provided for in the statutes, but also of linking up the International Association of Microbiologies with other organizations so as to conform to the general pattern of world developments in biological sciences. A connection with the Natural Sciences Division of the United Nations Educational, Scientific and Cultural Organization (UNESCO) through the intermediary of the International Council of Scientific Unions (ICSU) and the International Union of Biological Sciences (IUBS) is a natural development of this idea .

⁵⁶ Ralph St. John-Brooks, Circular to members of The International Association of Microbiologists, February 1947.

St. John-Brooks' proposal was a dramatic departure from the intent of the founders of the International Society for Microbiology. Dujarric, Bordet and others had envisioned a independent organization free from the political influence of outside international bodies. (Although the ISM had sought recognition from the Health Section of the League of Nations, it received no financial or administrative support.)

The International Council of Scientific Unions and the International Union of Biological Sciences were not new institutions. Both were founded in the decade following World War I. In the Fall of 1918, the allied governments held two meetings under the title Conferences des Académies Scientifiques Interalliées. The Royal Society of London, the Académie des Sciences, and the National Academy of Sciences jointly decided to construct a new network of international scientific organizations, and invited delegates from Belgium, Brazil, Italy, Japan and Serbia.⁵⁸ This decision was prompted in part by a desire to replace those international scientific organizations dominated by German influence (*e.g.*, the International Association of Botanists and the International Association of Academies).⁵⁹ The new international scientific unions were affiliated with national scientific societies and coordinated by an umbrella organization called the International Research Council (IRC).⁶⁰

Within a year of the initial meetings, three new unions were established: the International Astronomical Union, the International Union of Geodesy and Geophysics, and the International Union of Pure and Applied Chemistry. By 1926, an International Union of Biological Sciences (IUBS) had been formed and the nations formerly comprising the Central Powers were admitted to the International Research Council. Several other unions were also formed during the next two decades including the International Mathematical Union, the International Union of Pure and Applied Physics and the International Union of Scientific Radiotelegraphy. In 1931, the IRC was replaced by the International Council of Scientific Unions (ICSU), a loosely defined governing agency that afforded greater freedom to its member unions.

At first glance, one might question why the International Society for Microbiology did not immediately seek affiliation with these seemingly promising organizations. There are two probable explanations. First, these unions were not particularly productive at the onset. For example, the International Union of Biological Sciences did not hold a conference with a scientific program until its third congress in 1931. Even then, this organization was primarily concerned with only one biological science, botany.⁶¹ While the International Council of Scientific Unions promised substantial administrative support, its member unions lacked the necessary financial resources to accomplish much beyond their periodic congresses.

Secondly, these ICSU unions, and other intergovernmental bodies, were viewed with

⁵⁷ Ibid.

⁵⁸ Bates, 159.

⁵⁹ Stafleu, 144.

⁶⁰ George E. Hale, "The International Organization of Scientific Research," International Conciliation, no. 154 (1920), 436.

⁶¹ Stafleu, 146.

suspicion. The International Research Council was sponsored in part by the League of Nations and its Committee on Intellectual Cooperation, which many observers believed was inherently inefficient. Moreover, some scientists were convinced that the League was still dominated by a political bias in favor of the former Allied nations. In his 1930 evaluation of international scientific societies, Hugh Richardson lamented the transition from individual and voluntary enterprises to the state-aided organizations:

The first intervention of the states seems to have been in wrecking of the pre-war international scientific societies and the subsequent attempt to impose an allied international research council and affiliated unions with a limited conception of internationality It is not yet clear what these organisations will find themselves able to accomplish. Indeed, on their present records one might even doubt whether any political or state organisation such as the Société des Nations is competent to lead and inspire scientific research. The best evidence to the contrary comes from the medical side from the Health Section of the Société des Nations.⁶²

By 1946, the opinion regarding the International Council of Scientific Unions had shifted. Many of its member unions had held successful congresses before the outbreak of World War II. Moreover, with the enthusiasm that accompanied the creation of UNESCO was a hope that an umbrella organization had been created which might be able to enhance international scientific collaboration between congresses. Lastly, the President-elect of the Fourth Congress, Thorvald Madsen, had been a key participant in the Health Section of the League of Nations, and was a unequivocal advocate of integrating the IAMB into other transnational scientific organizations.

By 1947, there was a generally positive opinion of the International Union of Biological Sciences and the International Council of Scientific Unions among microbiologists and St. John-Brooks found all replies to his proposal favorable. With the final approval of the Permanent Commission, the IAMB would seek affiliation with the International Council of Scientific Unions (and UNESCO) at the next congress of the International Union of Biological sciences, conveniently held in Copenhagen one week after the Fourth International Congress for Microbiology.

St. John-Brooks' efforts to expand the structure of the IAMB did not end with that proposal. As former president of the Nomenclature Committee, St. John-Brooks understood the crucial role of type-culture collections in the construction of a international taxonomy and the treatment of pathologic disease. While the statutes of the IAMB (as well as its predecessor, the ISM) provided for the support of various national type-culture collections, there were little financial or administrative resources available to make these depositories fully integrated. Before World War II, St. John-Brooks had left the Lister Institute to manage the American Type Culture Collection at Georgetown University School of Medicine in Washington, D.C. In 1946, he brought his efforts to Switzerland at the Centre de Collection de Types Microbiens. In order to establish the internationality of this institution, St. John-Brooks proposed that the Centre become affiliated with the IAMB and that the World Catalogue of Strains maintained there should form the basis of an International Federation of Type Culture Collections of Micro-organisms.

These two proposals, integrating the IAMB into the larger international scientific

⁶² Hugh Richardson, "Science and International Cooperation," *Isis* 14 (1930), 223.

community and establishing an International Federation of Type Culture Collections, strongly reflected the shared belief of Madsen and St. John-Brooks that the International Association should be more than a organizing body for triennial meetings.

The Fourth International Congress for Microbiology officially opened on July 20, 1947. Nearly twelve-hundred participants from thirty-four countries attended the Congress. Unfortunately, since peace treaties had not been ratified with Germany, Austria, Japan and Italy, no official delegates from those countries were invited. The section conveners, however, were still able to construct a worthy scientific program for each of the nine sections: 1) General Microbiology, 2) Medical and Veterinary Bacteriology, 3) Viruses and Viral Diseases, 4) Serology and Immunology, 5) Variation and Mutation in Microorganisms, 6) Plant Pathology and Mycology, 7) Soil and Water Microbiology, 8) Dairy and Food Microbiology, and 9) Industrial Microbiology: Alcoholic and other Fermentations. The scientific program of the Fourth Congress was more narrow in scope than its predecessors. Although a greater number of papers were devoted to applied and industrial microbiology, missing from the program were sections devoted to protozoology, parasitology, and medical mycology; these topics were omitted because of a desire of the Executive Committee to concentrate on topics most relevant to Denmark.⁶³

While the scientific meetings, general sessions lectures and banquets were held in the lavish Palace of Christiansborg and in the annex of the Royal Theatre, the effects of the recent occupation were not easily overlooked. In his presidential address, Madsen felt obliged to apologize for the lack of comfortable housing, efficient transportation, working telephones or inexpensive food. Moreover, the Congress was held in the midst of a typographer's strike that made printing of programs, papers, and maps difficult. Admittedly, the Copenhagen Congress was a modest version of its three predecessors, but the circumstances did not preclude enlightening discussions on several issues.

As the first major meeting of microbiologists after the war, the Fourth Congress provided a vital function in the dissemination of information. There had been several crucial innovations and discoveries during the years since the New York Congress. While many of these findings had been widely known, the Congress allowed detailed discussions that were impossible during the six years of international conflict. In an opening address, Alexander Fleming tried to list the more notable of these developments:

The electron microscope has been perfected and we can see and photograph things like the bacteriophage or the influenza virus which were before invisible. We have improved the preparations of antigens against virus diseases so that if the world is stricken with another influenza pandemic like that of 1918 we shall not be quite helpless. The older methods of immunisation such as those against diphtheria have been improved. It was at the first of these Congresses that we heard for the first time of diphtheria toxoid precipitated by alum being used for the immunising of children. Now in this Congress we hear of a much purified toxoid being combined with definite proportions of a pure mineral carrier -- a step forward perhaps even

⁶³ In Madsen's own words, "Many of you will certainly miss important items, e.g. tropical disease which are completely missing in the program. We have thought better to concentrate on such subjects as those concerning us here in Denmark in the hope that these fewer subjects might then be more closely studied." Thorvald Madsen, Presidential Address, Fourth International Congress for Microbiology, 20.

greater in its practical results than the step from formol toxoid to alum precipitated toxoid.⁶⁴

The scientific sessions and social functions provided an essential forum for the dissemination of information beyond what was available in the scant war-time scientific literature.

As in previous congresses, there were a few speakers invited to present general sessions lectures to the Fourth Congress. There were two particularly lively topics raised during these lectures. British researcher F.C. Bawden delivered a paper entitled “Some Implications and Limitations of Recent Work on Plant Viruses.” In his discussion, Bawden emphasized that the nature of viruses was still poorly understood. By focusing initially on the study of plant viruses, Bawden hoped that some light might be shed on the fundamental processes that would explain their strange life-cycles and pathogenicity in general. He explained that future efforts to control viral diseases would be hampered until such basic knowledge was obtained. Furthermore, Bawden argued that the debate over whether viruses constituted an independent life form might not be as fruitful as was then believed. He was of the opinion that the issue was one of semantics and that virologists should devote more of their efforts to the study of mutations in viruses.

In a separate general sessions lecture, Rutgers soil microbiologist Selman Waksman delivered a paper entitled “Antibiotics and Life.” Waksman's name had become synonymous with the therapeutic use of the antibiotic streptomycin. The Fourth Congress was held shortly after the widespread introduction of streptomycin, and while dramatic clinical results were being reported, there were many issues of its usage still in question. Among the participants of the Congress, the importance of streptomycin was not underestimated. Penicillin had proven itself remarkably successful in the treatment of diseases caused by gram positive bacteria, but it was mostly ineffective against the gram negative group. Streptomycin was the first effective agent against many gram negative bacteria, and, by 1947, began to show promise in the treatment of mycobacterium tuberculosis.

Waksman delivered a concise, thorough review of the state of antibiotics, providing a brief listing of the hundreds of agents that were found to have marginal effectiveness in vitro or in vivo. In his discussion, however, Waksman suggested that more attention be devoted to the mode of action and the development of resistance to antibiotics. Unlike penicillin, resistance was a particularly troublesome issue with regard to streptomycin. “Because of the rapid development of resistance of bacteria to streptomycin, this antibiotic is considered as especially vulnerable. Since the physician is believed to have only one chance, he has to take special precautions in the use of streptomycin.”⁶⁵ A partial solution, according to Waksman, was the use of streptomycin in combination with some other chemotherapeutic agent.

Many of the key themes of Waksman's lecture were taken up by the section on General Microbiology. Alexander Fleming, the British discoverer of penicillin, was an appropriate choice to deliver the sectional opener. In Fleming's short discussion, he made one curious remark. At the Second International Congress for Microbiology in 1936, Fleming delivered a short presentation on the anti-bacterial effects of penicillin. Yet, mass production and clinical

⁶⁴ Sir. Alexander Fleming, “Address from English-speaking Microbiologists,” Fourth International Congress for Microbiology, Copenhagen, July 2-26, 1947, Report of Proceedings, ed. Mogens Bjorneboe (Copenhagen: Rosenkilde and Bagger, 1949) 24.

⁶⁵ Selman Waksman, “Antibiotics and Life”, Fourth International Congress for Microbiology, 77.

use did not arrive until the early 1940's. In explaining the delay, Fleming blamed only himself: . . . my connection with penicillin is an old story -- it happened before the first of these Congresses. I talked about it at the Second Congress and made a demonstration of some of its properties but I was not eloquent enough for no one took any notice and it was years after that before Florey, Chain and their colleagues concentrated it and showed its remarkable chemotherapeutic properties.⁶⁶

By 1947, the importance of penicillin and other potential antibiotics had become the primary focus of the Section on General Microbiology. The papers presented at the Fourth Congress grappled with issues of production, potency, toxicity, resistance and effectiveness of a plethora of antibiotic agents.

In addition to antibiotics, there were other issues of note in the sectional sessions, including topics featured at previous congresses: diphtheria, pertussis, pathogenic streptococci, tuberculosis, brucellosis, mechanism of infection and immunity, poliomyelitis, influenza, chemical investigation of antigens and antibodies, bacteriophage, induced mutation, and viral diseases. Of the more celebrated papers were A. Felix's contribution on the nature of bacteriophage, W.I.B. Beveridge's noting of the similarity between the viruses of mumps and influenza, F. Kauffmann's description of a diagnostic scheme for the *coli* group based on antigenic features, and Claude E. ZoBell's paper on the activity of bacteria in marine bottom deposits.⁶⁷

Beyond the general scientific program of the Congress, a number of committees performed important duties. The Permanent International Commission for the Organization of Congresses drafted new statutes for the International Association of Microbiologists in order to accommodate its proposed affiliation with the International Union of Biological Sciences. The statutes now referred to national microbiological societies, rather than national committees, as members. In order to enhance continuity between congresses, the President of the preceding congress would now remain in office until the beginning of the next. Additionally, the statutes allowed for a Permanent Secretary of the International Commission, whose office would be the headquarters of the Association. The ensuing congress would be arranged by the President-elect and national committee, with the officers of the International Commission acting in an advisory capacity. "When the difficulties experienced with the Second and Fourth Congresses are considered, it is easy to see why these steps were taken and why the statutes were to be considered provisional for three years."⁶⁸

Of lesser importance would be the proposal to revert to the original name of International Society for Microbiology. While this proposal passed overwhelmingly in the meeting of the Permanent International Commission, it was rejected by a show of hands at the General Assembly.

The Permanent International Committee on Bacteriological Nomenclature and its

⁶⁶ Sir Alexander Fleming, "Address from English-speaking Microbiologists," Fourth International Congress for Microbiology, 25.

⁶⁷ This list comes from a review article of the Congress written by Ralph St. John-Brooks, in Nature 160 (November 1, 1947) 598.

⁶⁸ Gibbons, 424.

Judiciary Commission approved and published the landmark scheme “Proposed Bacteriological Code of Nomenclature” edited by Robert E. Buchanan and St. John-Brooks. The Nomenclature Committee also endorsed the proposal that the Centre de Collection de Type Microbièn in Lausanne be associated with the IAMB. The goals of the Centre, “to prepare a World Catalogue of Strains of Micro-organisms and form an International Federation of Culture Collections of Micro-organisms” were whole-heartedly welcomed and supported the UNESCO annual allotment of \$23,000 to IAMB operations (distributed to eighteen national type culture collections).

Given their recent memory of world war, it was perhaps inevitable that the participants of the congress address the issue of biological warfare. The following strongly worded resolution was drafted and passed by acclamation:

The Fourth International Congress for Microbiology joins the International Society of Cell Biology in condemning in the strongest possible terms all forms of biological warfare. The Congress considers such barbaric methods as absolutely unworthy of any civilized community and trusts that all Microbiologists throughout the world will do everything in their power to prevent their exploitation.⁶⁹

The resolution reiterated the sentiment of the pacifist text in the first article of the International Society for Microbiology's original statutes. As an international group, microbiologists have repeatedly demonstrated a profound concern for the world beyond their microbes.

In recognition of his efforts in the founding of the ISM, the plenary session unanimously passed the following resolution bestowing an honorary office to R. Dujarric de la Rivière: On account of his single services to the Association and particularly with reference to the work he undertook in connection with the formation of the former International Society for Microbiology, of which he was Secretary, and in the organization of the Paris Congress, 1930, Dr. R. Dujarric de la Rivière, Institut Pasteur, Paris, be appointed Secretaire General Honoraire of the Association.⁷⁰

By the time of the Fourth Congress, Dujarric's days of unending administrative work for the organization had long passed. However, the resolution and honorary appointment were a testament of thanks to one who had given so much.

The Plenary Session closed with the announcement that the Fifth International Congress for Microbiology would take place in Rio de Janeiro in the latter part of 1950. While the Fourth Congress lacked many of the amenities and some of the scientific program of its predecessors, it was nonetheless heralded as a remarkable success. As Ralph St. John-Brooks wrote later that year:

Apart from the exchange of scientific knowledge and the exploration of the ever-widening horizons of research, one of the most important functions of international congresses of this kind is the formation of fresh personal contacts and the renewal of old associations and friendships. This was particularly applicable to the present occasion when, owing to the brutal intervention of global war, nearly eight years had passed since a similar concourse had gathered in New York

⁶⁹ Fourth International Congress for Microbiology, 36.

⁷⁰ *Ibid*, 37.

City under the shadow of a world catastrophe At the end of the week the delegates returned to their scattered homes with happy recollections of good fellowship, of high endeavor and of successful achievement.⁷¹

Led by the administratively savvy Olympio de Fonseca Filho as President, the Executive Committee proceeded with arrangements for the Fifth International Congress for Microbiology to open on schedule, in August of 1950. The dates were selected to coincide with the 50th Anniversary celebration of the Instituto Oswaldo Cruz, the preeminent microbiological research institute in South America, and the Brazilian Government provided financial and logistical support for the meeting.

In structure and content, the Rio de Janeiro Congress closely resembled the New York Congress. However, due to the depleted economies of most European governments, few microbiologists from the Old World were able to attend. Even representatives from American confronted considerable difficulty in making affordable travel arrangements. The official travel agent for the congress listed round-trip air fare from New York to Rio de Janeiro at \$828. A coach class boat ticket approached \$600. In order to defray the formidable costs to European microbiologists, the Brazilian government appropriated approximately \$100,000 for travel expenses and mailed courtesy boat tickets to nearly one-hundred American and European scientists.

The foreign delegation to the Fifth Congress received financial boost from American Society representative Stuart Mudd, UNESCO, and President Truman. In order to guarantee the international character of the Congress, Mudd circulated, and then forwarded, a written appeal for financial support to President Truman. In this appeal, Mudd noted that while UNESCO was empowered to provide administrative and financial support for the congresses of International Council of Scientific Unions, the “available funds were insufficient to perform their many valuable tasks adequately.” The appeal went further to explain:

The value of these meetings is very great in terms of diffusion of scientific knowledge and even more essential in terms of personal association and understanding among scientists and technologists of different nations. The special scientific and technological organizations of each nation do what they can to aid their qualified members to get to these meetings but with travel expense as it is now that aid given is absurdly inadequate The usefulness of these international gatherings will be in general proportion to the numbers of qualified scientists who are able to attend and the nations represented. I am advised that it will be quite impossible for most European scientists to get to the International Congress of Microbiology at Rio de Janeiro unless travel aid is forthcoming . . .⁷²

The appeal requested that the United States allocate enough money to pay for two-thirds of the travel expenses for qualified European scientists to fourteen congresses of the International Union of Biological Sciences. Although Mudd's request was not fully granted, UNESCO was given additional funding to support foreign delegates to the Rio Congress.

⁷¹ Ralph St. John-Brooks, “Fourth International Congress for Microbiology,” *Nature*, 601.

⁷² Stuart Mudd, Open letter to President Truman, Reproduced in Society for American Bacteriologists Newsletter, 1949.

While most international scientific meetings were still feeling the effects of the post-war frugality, the Fifth International Congress for Microbiology transpired in the most lavish of settings. Possibly six-hundred and ninety-seven delegates representing thirty seven different countries were in attendance. The actual number of participants is somewhat in doubt. The official proceedings, published eight years later, list one-thousand and ninety-five in attendance, with four-hundred and thirty-four “official” delegates. The November 1950 ASM Newsletter placed the Brazilian attendance at four-hundred and ninety, which included members of the families as well as active microbiologists. In his brief history, Norman Gibbons suggested that the total attendance was closer to three-hundred and eighty persons.

On the opening day, the Minister of Education and Health, Professor Pedro Calmon, and the President of the Republic, General Eurico Gaspar Dutra received the varied participants. Later in the week, the delegates were entertained by the Mayor of Rio de Janeiro in the former presidential palace at an event that featured an extravagant champagne buffet and a command performance of the National Ballet in the palace gardens.

In contrast to the Copenhagen Congress, the scientific program of the Fifth Congress was broad and expansive, including many topics absent from prior congress. The sessions were divided into eleven sections: 1) General Microbiology, 2) Medical and Veterinary Bacteriology, 3) Viruses and Virus Diseases, 4) Rickettsiae and Rickettsial Diseases, 5) Medical and Veterinary Mycology, 6) Medical and Veterinary Protozoology, 7) Plant Pathogenic Micro-organisms, 8) Soil and Water Microbiology, 9) Industrial Microbiology, 10) Immunology and Allergy, and 11) Classification and Nomenclature of Micro-organisms.

The small number of participants at the Fifth Congress did not preclude a successful scientific program. Over two-hundred and fifty papers were presented, with many published in the Proceedings in full. Even the abstracts were double the standard length. There is some indication that the Brazilian health officials had hoped to use the published proceedings in a text-book fashion in some universities and research institutes.

The list of sectional presidents featured many of the preeminent researchers of the time. And, while most sessions were occupied with perennial issues such as tuberculosis or antibiotics, lively discussions focused on concerns indigenous to South America and other tropical regions (*e.g.*, yaws, pinta, yellow fever, Chagas disease, amoebiasis, and leishmaniasis). The meetings of the Nomenclature Committee were once again productive, although as Mudd later remarked, “of particular interest may be the fact that nomenclature of viruses is to be left in abeyance for the present.”⁷³

The closing Plenary Session teemed with important decisions. Surprisingly, the statutes of the IAMB were not changed; those provisionally adopted at the Copenhagen Congress were accepted by the International Union of Biological Sciences IXth General Assembly at Stockholm in 1950 and constituted a Microbiological Section of IUBS. (However, a committee was set up to study the Statutes again and report to the Sixth Congress.) At the meeting of the Permanent International Commission for the Organization of Congresses, Christian R. Klimt, representing the World Health Organization, invited the IAMB to apply for official relations with WHO. Technically, such relations allowed the IAMB to be represented at WHO meetings, to suggest

⁷³ Stuart Mudd, “Fifth International Congress for Microbiology,” SAB Newsletter (November 1950) 15.

agenda items of the World Health Assembly, and to receive all relevant documentation.⁷⁴ Additionally, Klimt indicated that the IAMB's participation was required in the formation of the new system of Expert Advisory Panels. The International Commission and the General Assembly accepted this invitation and Guisepe Penso immediately “proposed that a request be submitted to the Executive Board of the World Health Organization for unification of procedures for postal shipment of biological samples (bacteriological cultures and virus specimens) throughout the world.”⁷⁵

As for the location of the Sixth International Congress for Microbiology, the Permanent Commission had numerous sites from which to choose. Formal invitations were received from the Italian, Spanish and Argentine delegations. The actual choice, however, was not difficult. Owing to the recent death of their chief representative, Juan Marcilla, the Spanish Delegation withdrew their invitation for 1953, but hoped that it would be possible to hold a Congress in Spain for in 1956. In order to maintain the (short-lived) tradition of holding alternate congresses in the old and new worlds, there was an offer to hold the Seventh Congress in Buenos Aires in 1956. The Italian invitation to hold the next (Sixth) Congress in Rome in 1953 was accepted by acclamation.

Planning for the Rome Congress commenced only a few short weeks after the close of the Rio meetings. Although the Italian National Society elected V. Puntoni as President of the Organizing Committee and E. Biocca as its Secretary-General, the Rome Congress was very much the product of one of the Vice-Presidents, Guisepe Penso. As an official representative of Italy to two Congresses, Penso was quite familiar with the organizational shortcomings of the IAMB. Within a year he contacted each of the national societies to solicit papers and field suggestions for possible section topics. In conjunction with Secretary-General Biocca, Penso also lobbied for significant changes in the structure and direction of the International Association of Microbiologists.

Initially, the format of the Sixth Congress differed from any of the previous meetings. A subscription to the IAMB **entitled** a researcher to present a paper in one of the sections. It quickly became a matter of policy that **no** paper abstract would be turned down (a fact that could explain the eight pound, six volume, published Proceedings). The policy of open acceptance also applied to multiple submissions. For example, the subsection on Lipid Antigen-Antibody Reactions listed seven papers in succession from University of Michigan researcher R.L. Kahn. As Robert Breed later rationalized, “among the 1028 abstracts published there is naturally some chaff in the wheat as the Congress authorities accepted and published all abstracts sent to them. However, the whole group of papers presents a picture of the diversity and importance of the field of microbiology.”⁷⁶

The Sixth International Congress for Microbiology proved to be a spectacular public event, attracting considerable attention from the popular press. Unfortunately, as one observer noted, the Italian newspapers were all too quick in reporting the most sensational reports,

⁷⁴ “Minutes of the Permanent International Commission for the Organization of Congresses,” Arquivos do V Congresso Internacional de Microbiologia, Volume I, (Rio de Janeiro: Departamento de Imprensa Nacional, 1958) LXXIX.

⁷⁵ Ibid.

⁷⁶ Robert S. Breed, “Sixth International Congress for Microbiology,” SAB Newsletter (January 1954).

regardless of their scientific merit:

It was, indeed, a travesty on the large amount of substantial work contributed to the Congress that much of the press coverage was devoted to a few lurid accounts that ought not to have appeared on the program. The press coverage, in general, concerned itself with the spectacular and with the outlandish; although only the former might be classed as news for the average reader, a substantial level of science reporting would seem to be incumbent upon the metropolitan daily press.⁷⁷

In order to accommodate the flood of submissions, the Congress was divided into the following twenty-two sections, many of which were separated into subsections:

- SECTION I: General Microbiology
 Subsection A - Bacterial Taxonomy
 Subsection B - General Morphology and Microbial Cytology
 Subsection C - Chemistry of Micro-organisms
 Subsection D - Microbial Metabolism
 Subsection E - Biological Behavior of Micro-organisms
- SECTION II: Growth Inhibitors
- SECTION III: Genetics of Micro-organisms
- SECTION IV: Pathogenicity (Virulence and Toxins)
- SECTION V: Microbiological Technique and Diagnosis
- SECTION VI-VI: Immunology and Immunochemistry
- SECTION VIII: Animal Viruses
- SECTION IX: Plant Viruses
- SECTION X: Bacteriophages
- SECTION XI: Rickettsiae
- SECTION XII: Schizomycetes
 Subsection A - Anaerobes
 Subsection B - Enterobacteriaceae
 Subsection C - Mycobacteriaceae
 Subsection D - Miscellanea
- SECTION XIII: Spirochetes
- SECTION XIV: Fungi
- SECTION XV: Protozoa
- SECTION XVI: Microbe Transmitting Arthropods
- SECTION XVII:
Subsection A - Microbiology Applied to Human
and Experimental Pathology
 Subsection B - Microbiology Applied to Veterinary Pathology
- SECTION XIX: Industrial Microbiology and Microbiology of Fermentations
- SECTION XX: Microbiology Applied to Hygiene
- SECTION XXI: Microbiology of Milk and Foodstuffs

⁷⁷ Walter J. Nickerson, "Sixth International Congress for Microbiology," *Science* 118 (18 December 1953) 737.

SECTION XXII: Marine Microbiology

This last section was added in the final months of preparation and appears to be the first recognition of the IAMB that marine microbiology was a separate field of study from the microbiology of industrial water sewage.

In addition to the more than one-thousand papers presented in the twenty-two sections, six symposia were constructed featuring invited papers from well-known microbiologists. The topics for the symposia were: 1) Bacterial Cytology, 2) Microbial Metabolism, 3) Nutrition and Growth Factors, 4) Growth Inhibition and Chemotherapy, 5) Actinomycetales, and 6) Interaction of Viruses and Cells. Each symposia contained nine to twelve papers which were published in full, with illustrations. The symposia were printed in four languages and were available separately through British, American and European publishing companies.

The Nomenclature Committee was steadily engaged at the Rome Congress. The International Code of Bacteriological Nomenclature was again reviewed, this time with numerous revisions. Reports were presented by the Subcommittees on Anaerobes, Enterobacteriaceae, Leptospira, Streptococcus Serotyping, Staphylococcus phage-typing, Viruses, and Enteric phage-typing. In all, the various activities of the Nomenclature Committee represented nearly a hundred pages of decisions, recommendations, and resolutions demonstrating clearly that this was one segment of the International Association active between congresses.

The attendance at the Sixth Congress easily surpassed that of any previous congresses. More than two-thousand delegates from every scientifically developed country in the world were present. For the first time since the 1936 London Congress, no principle country was unrepresented. The sections were held in the halls of the Citta Universitaria, while the six symposia were offered concurrently in the adjacent Istituto Superiore di Sanita. Unfortunately, many sessions were hampered by persistent overcrowding.

In recognition of the Congress, the Italian Government issued a postage stamp bearing the picture of Agostino Bassi who, in 1834, was the first to demonstrate that a microorganism was the causative agent of an animal disease and all delegates received the Congress Medal, a white metal impression of Franciscus Redi. Maintaining the standard set by previous international scientific meetings, an elaborate program of entertainment was arranged for the members, including a sizable banquet, a reception by civic officials at the Campidoglio, a symphony concert, and an excursion to the excavations at Hadrian's Villa.

At the meetings of the Permanent Commission, Secretary-General Biocca had much to discuss. In the year preceding the opening of the Congress, Biocca wrote to every member national society inquiring what structural changes to the association would be beneficial. The submitted Secretary General's report communicated three principle responses:

- 1) Necessity to transform the present Association into a Federation of National Societies. This Federation should really function during the intervals between Congresses while at the present this Federation functions only by name during the periods between Congresses.
- 2) To permit the National Societies to group themselves into regional organizations.
- 3) To put the International Federation of Culture Collections of Microorganisms under the support of our Associations.

The first point was hardly new, and yet generated still another debate on the profitability of a

more active organization. The second point had been strongly supported by the European National Societies and sought to accommodate the wishes of those researchers unable to make the trans-atlantic journeys.

The last issue, placing the International Federation of Culture Collections of Microorganisms (IFCC) under the support of the Association, was a rather confusing issue. The IFCC was created at the Copenhagen Congress under the aegis of the IAMB. However, in the intervening years, the Federation had become an independent organization. Unfortunately, confusion arose over which international body -- the IAMB, the IUBS, or UNESCO -- was to provide and oversee the administration of funds. By reestablishing official ties with the IFCC, the Secretary-General hoped to facilitate greater coordination among those national societies involved in the exchange of type culture collections.

Additionally, Biocca initiated relations with the "Counseil pour the Coordination des Congrès Internationaux des Science Médicales" (CCICMS). In preparation for the Rome Congress, the Italian Organizing Committee wished to receive financial aid from this Council. While the CCICMS generally aided the organization of international congresses, Biocca was told that money was not forthcoming since the IAMB was not a member of the Council. Biocca informed the Sixth Congress that an invitation had been extended to join that Council while still remaining a section of the IUBS. He suggested that such an affiliation would be beneficial and pointed to the advantages that had already been evident in the relations with WHO.⁷⁸

The Secretary's report closed with a lengthy call for a "reinforcement of the association." Biocca was unsettled at the current state of "affiliation" among the member National Societies: At present, the General Secretary ignores the real set-up of the National Societies of Microbiology, their exact number, their exact address, their finalities, and their activities. This ignorance from our part is due to the fact the Societies are not connected in any official form with our Association . . .

Biocca called for an establishment of a "Federation" of national societies. In addition, he believed that it would be possible to solicit fellowships from national research councils, private industries and foundations. Such a federation could also encourage the exchange of scientific personnel among nations in the years between congresses.

Biocca's appeal was supported by the report of the Commission for the Amendment of the Statutes of the International Association of Microbiologists. The Commission, appointed at the Rio Congress, devoted three years to the drafting of entirely new statutes.⁷⁹ Once again, the organization adopted a different name. More importantly, the focus of the Association was shifted to emphasize the role of national societies. While many features of the old structure were to remain, several changes were suggested.

Surprisingly, the proposed Statutes passed without revision or substantial discussion.

⁷⁸ The World Health Organization, in conjunction with the Universal Mailing Union, had immediately taken up the matter of standardization of shipping microbiological cultures. Although the Association was represented at all WHO meetings, it was not granted voting privileges. According to Biocca, "if our Association was better defined, we could have a prominent position in it."

⁷⁹ Comprising the Commission were Alexander Flemming, Olympio de Fonseca, Albert J. Kluyver, Stuart Mudd and Giuseppe Penso. Professor Mudd had been named Reporter of the Commission, but was too ill to attend. In his place, Kluyver read the draft statutes.

The General Assembly reconvened the next day to elect its new Executive Committee. A.J. Kluyver presented the following list of officers:

President	--	Sir Frank MacFarlane Burnet (Australia)
Vice Presidents	--	A. Ashley Miles (Great Britain)
	--	Stuart Mudd (USA)
Treasurer	--	Maurice Welsch (Belgium)
Secretary General	--	Guiseppe Penso (Italy)

The list was approved unanimously with applause. The final task of the Assembly was to choose a site for the next congress. While an invitation was read by Raoul Ferramola to hold the Seventh Congress in Buenos Aires, Argentina, a proposal was made to hold the congresses every four years instead of three. Furthermore, it was suggested that the President should choose the location. In light of the tradition of the triennial congress, and in order to maintain the rhythm with the assemblies of the IUBS, the first proposal was defeated.

Curiously, the Argentinean invitation was not accepted. Apparently, many European representatives were opposed to holding the next congress in South America. As no other invitations were present, the site of the next congress was left to the President. Unfortunately, this decision proved to be more difficult than expected. With the increasing size of the assemblies, and with the traditionally lavish scale of entertainment, it grew ever more difficult for member countries to accept the (financial) responsibility for future congresses.

While the Rome Congress had reshaped the Association (as it had been known) into a more active scientific body, the usefulness of the enormous international congress was beginning to be questioned. As an article in *Science* explained, there was much to be said in favor of small gatherings of one hundred persons for the discussion of select topics. The work of the group could be reviewed in detail, its proceedings could be published in one or two volumes, and limitations on the site for the meeting would be few.

In view of the sectionalized tendencies that are becoming increasingly apparent in international congresses and in the large national meetings, the question might well be raised whether the pattern in international meetings exemplified by the Cold Spring Harbor Symposia is not one which will probably be more informative and beneficial than meetings on so gigantic a scale as the Sixth International Congress for Microbiology.⁸⁰

⁸⁰ Nickerson, 738.

CHAPTER 4 THE NEW CONSOLIDATION

The International Association of Microbiological Societies (IAMS) was a very different organization than its predecessor, the International Association of Microbiologists (IAMB). Initially, the functional administration of the organization was divided between two bodies: a permanent executive committee and an organizing committee for the following congress. Secondly, the new Executive Committee was given a mandate to expand the role of the IAMS between congresses. While the Rome Congress had been an achievement, the newly formed Association quickly confronted a series of administrative crises. Fortunately, the members of the Executive Committee -- Penso, Miles, Mudd, Welsch and Burnet -- were eventually able to overcome these difficulties.

The immediate problem concerned the location and format of the Seventh International Congress for Microbiology. The Rome Congress closed without an acceptance of an invitation from any National Society. While one invitation, from the Argentina Society, was presented, it was not accepted (some European delegates were ill at ease with the current government of Argentina in the late 1950's). As Secretary-General Penso explained in his first letter to President Burnet:

In order not to refuse the kind Argentine invitation and since there was not any other offer made, the General Assembly incharged [sic] our Committee to choose the location and the country where next Congress could be held in 1956.⁸¹

There was a shared sentiment among Executive Committee and national society members that Western Europe and Eastern North America were more convenient to the majority of microbiologists than such exotic locations as Japan, India, Australia or South America.

Owing to the difficulties in planning for a large international congress, the Executive Committee was forced to actively solicit invitations from national societies. Such solicitation was not an easy task. Not many national societies would finance the substantial cost. While hosting an International Congress for Microbiology was undoubtedly an honor, few governments could afford an event comparable to the Rome Congress, especially if the host nation felt obliged to provide travel incentives for researchers from different countries. Moreover, there was a growing consensus that the format of the next congress would have to be altered. As the Executive Committee grappled with the choice of locations for the next congress, Vice-President A. Ashley Miles lobbied for five general guidelines:

- (1) that the congresses be held in four year intervals instead of three.
- (2) that two congresses should be held on the European continent for every one congress held elsewhere.
- (3) that the number of sections should be limited to 10 or 12, and that some selection of the submitted papers be excised with preference given to younger workers.
- (4) that invited symposia (as in Rome) should be a prominent feature and not run concurrently to

⁸¹ Giuseppe Penso, Rome, to Sir Macfarlane Burnet, Melbourne, 23 October 1953.

the sectional meetings.

(5) that the proceedings should be published within a few months of the Congress in order to persuade workers to contribute their latest findings.⁸²

These proposals were warmly welcomed, but did not settle the immediate issue of finding a suitable site for the Seventh Congress. (Penso, however, objected to the age preference on the grounds that it was arbitrary and counterproductive.) By the January of 1954, the Executive Committee had prepared a short list of national societies to contact, including Germany, Sweden, Belgium and Canada. Nonetheless, two of these choices were somewhat less attractive -- there were slight objections to Sweden, since a Scandinavian country had hosted the 1947 congress, and to Germany from lingering political sentiments.

Representatives from Belgium and Canada were the first to reply. Belgium declined to extend an invitation for financial reasons, and while the Canadian response was similar, they offered to host the following congress in Montreal in 1959 or 1960. In June of 1954, President of the Executive Committee, Sir Frank Macfarlane Burnet, investigated the possibility of holding the Seventh Congress in London, under the joint sponsorship of the United Kingdom and Australia. Unfortunately, the Commonwealth Government refused to provide support for a congress held outside Australia, and Burnet withdrew the proposal.

By the Fall of 1954, the available options had changed dramatically. Penso received unofficial word from sundry German microbiologists that their national society might be willing to organize the next congress. Furthermore, tentative invitations were received from Turkey, Spain and the Great Britain. The actual selection, however, was more limited. The Turkish National Society discovered that its government was unable to financially support any congress in 1957 or 1958. Additionally, there were doubts expressed by members of the Executive Committee that the Turkish microbiologists could organize a large international meeting on such short notice. Curiously, the Spanish invitation never fully materialized. Penso and Miles made numerous inquiries concerning the proposed Madrid Congress, but their letters went unanswered. And, since London had been the location of the 1936 congress, there was a disinclination toward another British congress.

The Executive Committee accepted the German National Society's invitation for Seventh International Congress for Microbiology in 1956 (possibly in 1957), and set its sites toward the Eighth for Montreal in 1960. However, planning for the German Congress was truncated after only nine months. In September of 1955, German officials notified Penso and Burnet that the chief organizer of the Congress, Professor Schutz, had fallen seriously ill, and was unable to continue his duties. Since an immediate replacement was not available, the German Society requested that the IAMS seek a different country for the next congress.

The German announcement left the Executive Committee of the IAMS in a "very precarious situation" (one that drew considerable discontentment among Executive Committee members). Burnet suggested that the Soviet Union or other Eastern European countries be considered. Unfortunately, the international political climate rendered this option unattractive. For example, Burnet was obliged to ask that other members of the Executive Committee contact the Soviet and East European Societies since Australia and the Soviet Union had broken off

⁸² A. Ashley Miles, London to Giuseppe Penso, Rome, 10 November 1953.

official diplomatic relations. Additionally, there was a lingering uneasiness with past Soviet non-involvement in the organization of international scientific meetings. As one member of the Executive Committee recollected:

. . . the Russian government made no response to the efforts by the Danish government to enlist the participation of Soviet scientists in the (Fourth) Congress. Similarly, the Soviet government did not respond to the invitation of the Brazilian scientist to participate in the Fifth Congress in Brazil It is perfectly possible that your letter to the Academy of Sciences may remain unanswered for a long time, perhaps indefinitely. Since time is rapidly running out, I should be inclined to risk this, at the same time trying to stimulate invitations from other countries.⁸³

Penso too recalled that he received no reply from the Soviet Delegation when invited to the Rome Congress or a later symposium in Lyon. The Executive Committee chose immediately approach Sweden and Switzerland. If those inquiries were to fail, Russia, Czechoslovakia, and Hungary would be solicited next (subject to the approval of the western governments). If all of these measures proved fruitless, the Executive Committee would accept the unofficial invitation from the British Society for General Microbiology to hold a “stop-gap” congress in 1958.

Once again the replies were not entirely favorable. Switzerland was unable to finance the Congress as it had already underwritten the expenses for the Congress of International Comparative Pathology in 1955 and the Congress of Allergy in 1956. And, a representative from the Soviet Academy of Sciences informed Vice-President Miles that there was only a slight possibility of hosting a congress in Moscow.

Fortunately, the Swedish Society tendered an invitation in April of 1956 to host the next congress in Stockholm, although 1957 was seen as impracticable. After three long years of searching, the Executive Committee gratefully accepted the five year interval between the Sixth and Seventh Congresses and the date was set for the Summer of 1958 (with the Canadian Congress moved to 1962). The invitation did carry one stipulation, “that the congress should not number more than 1,000 participants.” While the entire Executive Committee was in favor of such a limitation, there were concerns directed towards any selection process.

Aside from the location for the next congress, the Executive Committee faced other predicaments. One of the more troublesome concerned the status of the International Federation of Culture Collections of Micro-organisms (IFCC). The IFCC was created at the 1947 Copenhagen Congress in partnership with the International Association of Microbiologists. The headquarters for the IFCC was to be the Centre de Collection de Types Microbiens in Lausanne, under the direction of Paul Hauduroy and Ralph St. John-Brooks. The IFCC was thus tied to the International Union of Biological Societies, as well as the International Council of Scientific Unions (and was supported by UNESCO funds).

Curiously, St. John-Brooks moved the Federation from Lausanne to the headquarters of the American Type Culture Collection in Washington, D.C. At the Fifth International Congress in Rio, the governing committee of IFCC did not explain its action, nor did it present itself for reelection. In fact, there is almost no mention of the Federation in any of the official Proceedings. As far as many officials within the International Association of Microbiologists were concerned, the IFCC was an autonomous body. Although the Rome Congress in 1953

⁸³ Stuart Mudd, Philadelphia, to Sir MacFarlane Burnet, Melbourne, 27 September 1955.

passed a resolution to reintegrate the IFCC into the International Association of Microbiological Societies and International Union of Biological Societies, the functional independence of the Federation remained. Secretary General Penso noted that “in fact the Federation behaved as an independent organisation, and worked without consulting or communicating with the Association.”⁸⁴ More importantly, the distribution of UNESCO money (by way of the International Council of Scientific Unions) was channelled entirely through the IFCC, without asking for the opinion or approval of the IAMS.

In 1954, the International Council of Scientific Unions determined that UNESCO support for type culture collections would no longer be funnelled through the IFCC, but the IUBS. There were several dramatic consequences of this decision. The IUBS found itself remarkably unprepared to distribute the grants for fiscal year 1955 and immediately delegated the task to the IAMS, acting as a section of the IUBS. The IAMS, in turn, resubmitted the exact distribution requests present by the IFCC a short time earlier, save the allocation for the Federation secretariat, which was redirected to a mycology collection.

The reaction of the IFCC officials was nothing short of contentious. In November of 1955, the chairman, preeminent Dutch microbiologist Albert Jan Kluyver, along with the secretary of the Federation, New York Department of Health official Julia Coffey, submitted letters of resignation to ICSU, IUBS, and IAMS executives. Kluyver and Coffey accused the IUBS and IAMS of wrongfully annexing IFCC, insisting that it was “a matter of common courtesy that a decision implying annihilation of an international organization . . . should not be taken without advance notification of persons directly concerned.” Moreover, they were angered by the reduction in UNESCO allocations, from \$11,000 in 1953 to \$2,500 in 1955.

Unfortunately, the outcome of this controversy was never fully resolved. Penso, Welsch and Burnet tried desperately to mend strained relations between two organizations that shared so many of the same goals (as well as members). The Executive Committee of the IAMS opted to create a new sub-committee empowered to make recommendations for the distribution of funds to the IFCC. Although cooperative relations between the two organizations were reestablished by 1957, the functional status of the International Federation of Culture Collections remained uncertain.

The administrative troubles for the IAMS did not end with the IFCC. There were other struggles for organizational independence. Since the 1936 London Congress, the Committee of Bacterial Nomenclature created **sub-committees** devoted to studying specific taxonomic issues, as it deemed necessary. These sub-committees were directly accountable to the Nomenclature Committee and submitted reports at the General Assembly of each Congress. However, at the 1950 Rio Congress, an International **Committee** of Enteric Phage Typing (ICEPT) was created, with ambiguous connections to the Nomenclature Committee. Its chairmen, London researchers A. Felix and James Cragie, considered the Committee for Enteric Phage Typing as a separate entity.

At the 1953 Rome Congress, executives of the Nomenclature Committee sought to reorganize their subcommittees. As part of that reorganization, the Committee recommended to the Plenary Closing Session that Enteric Phage Typing become a subcommittee of the

⁸⁴ Giuseppe Penso, Rome, to all members of the Executive Committee of the International Association of Microbiological Societies.

Nomenclature Committee, and be reduced in size. While no definitive action was taken at the Rome Congress, Nomenclature Committee chairman Kluver suggested that the Executive Committee consider this recommendation at a later date. For Secretary Penso, this task implied mediating a rather unpleasant organizational struggle. In the Spring of 1954, Felix and Cragie wrote Penso and the new Chairman of the Nomenclature Committee, Everitt G.D. Murray, protesting the proposed annexation, "it is clear, therefore, that the Nomenclature Committee has no right whatsoever to interfere with the work of the I.C.E.P.T."⁸⁵

Penso was able to dissolve much of the controversy and the Executive Committee deferred action until the next congress. Felix and Kluver latter exchanged cordial replies on the matter. The question of organization resurfaced a year later, after the sudden death of Felix. The Executive Committee was once again requested to consider the status of the Enteric Phage Typing Committee, which, in one Nomenclature Committee member's opinion, was considered "unusually large, and encumbered with a constitution reminiscent of a dictatorship."⁸⁶ This time Penso's response was more definitive -- the structural relationships would remain status quo until the next congress. In fact, there was a strong sentiment in favor of making many of the subcommittees independent and, thus, directly responsible to the Executive Committee.

The focus of the final organizational crisis was potentially the most threatening -- the resignation of the president Frank Macfarlane Burnet. Burnet was elected president of the Permanent Executive Committee of the IAMS by acclamation at the 1953 Rio Congress, a meeting at which he was not present. Burnet was informed by letter of this honor. His reply to Penso was very cautious:

I was very interested to receive your letter saying that I had been chosen as president of the International Association of Microbiologists. I am highly honoured, but I am not sure that the choice was a wise one. Apart from occasional visits to England and America, I have had virtually no experience at the international level and my knowledge of languages other than English is very limited indeed. I should like my acceptance of the presidency to be regarded as provisional only until I shall have an opportunity to discuss the matter with you.⁸⁷

Upon visiting Europe, Penso convinced Burnet that the presidency was mostly an honorific office, and that the remainder of the Executive Committee would handle most administrative tasks until an Organizing Committee for the next congress was chosen.

However, the correspondence between the President and the other members of the Executive Committee reveal that Burnet was never comfortable with even the advisory duties of the his office. On several occasions, Burnet declined involvement in difficult administrative decisions, noting that his lack of experience in IAMS matters. Furthermore, there is some indication that Burnet did not see a proper role for the IAMS outside of organizing the International Congresses. In a letter to Penso, dated October 15th, 1956, Burnet wrote: Now that the International Congress has been firmly accepted by Sweden, I feel that the chief reason for my being on the Committee has been accomplished and I should like to give notice of my resignation. In order to allow new arrangements to be made in time, I suggest that it should

⁸⁵ A. Felix, London, to Giuseppe Penso, Rome, 1 March 1954.

⁸⁶ Sam T. Cowen, London, to G. Penso, Rome, 25 January 1956.

⁸⁷ Sir Macfarlane Burnet, Melbourne, to G. Penso, Rome, 6 October 1953.

take effect at the end of December 1956. I feel very definitely that the President should be someone with wider international contacts and interest than I possess or can hope to develop and preferably located in Europe Could you inform me as to the correct procedure in resigning from the Committee? I presume I address it to the President of the IUBS.⁸⁸

Fearing that the resignation of the president might undercut the fragile administrative continuity of the IAMS, Penso vigorously lobbied to change Burnet's mind. Penso, Miles, and Mudd quickly mailed letters imploring Burnet to remain in office until the Stockholm Congress. Penso's plea eloquently read:

As you will know we all appreciate very much the work you have done for our Association, and I strongly feel that your resignation could greatly harm our Association. Your equilibrium and your sharp point of view in many questions cannot be replaced by anyone else, I am sure, and therefore I want to beg you very strongly to reconsider your resignation and to remain as our President at least until the next Congress; could you really think this may be possible for you?⁸⁹

Burnet was unmoved. In a curt reply to Penso, he explained "I was not happy about my appointment which, as you know, was unsought and unexpected and I am not basically in sympathy with the functions of the Committee other than arranging for the next International Congress. I should be glad if you would do whatever is necessary to implement my resignation."

Relentless, Penso again wrote to Burnet, this time conveying the sentiments of several National Societies. Furthermore, Penso explained that, technically, a new President could not be chosen until the Plenary Session of the next Congress. In a final effort, Penso suggested that Burnet remain as President in name only, and that it would be possible to spare him of any future administrative work. Macfarlane Burnet reluctantly acceded:

But it must be made clear that in doing so I accept no responsibility for any of the actions of the Committee in regard to matters other than the arrangements now completed for finding a host for the next Congress. I do not think the constitution of the Committee is suitable for such functions as distribution of grants for type culture collections . . . I am not in a position to offer any advice on the matter and my future association with the Committee can only be a purely nominal one.⁹⁰

Burnet took no part in the planning for the Stockholm Congress and was deeply disappointed to discover that he would not be officially replaced as President until the fourth day of meetings. Fortunately, Burnet's discontent went unnoticed. He wished no ill for the Seventh Congress, and most of the public relations tasks were the burden of Sven Gard as President of the Congress.

In retrospect, one can be sympathetic to the position of Sir Macfarlane Burnet. The respect and admiration for his scientific skill landed him an office that he did not want and did not believe he was capable of administering. In the most urgent matter facing the Executive Committee, finding a host country for the Seventh Congress, Professor Burnet took an active role. As for the other administrative duties, he mostly viewed them as burdensome or inappropriate. It is beyond question that an officership of a large international scientific society

⁸⁸ F. Macfarlane Burnet, Melbourne, to Giuseppe Penso, Rome, 15 October 1956.

⁸⁹ G. Penso, Rome to M. Burnet, Melbourne, 5 November 1956.

⁹⁰ Macfarlane Burnet, Melbourne, to Giuseppe Penso, Rome, 17 November 1956.

is a formidable and thankless task, despite the recognition that it carries.

The actions of the International Association of Microbiological Societies were not always consumed by crisis management. In fact, the Association made several efforts to develop the activities of international microbiology beyond periodic congresses. Regional organizations, as prescribed in the 1953 Rome statutes, were formed in the Far East, South America and Europe. In 1954, the mycologists in the Association agreed to construct a separate Section of Mycology at the next Congress. The IAMS organized two Conferences on Immunomicrobiological Standardization (Lyon, 1955 and Rome, 1956) and the First Conference on Food Microbiology (Holland, 1957). The experts of alimentary microbiology organized an international symposium at the Pasteur Institute in Lille, and in 1956, the IAMS was invited to become a member of the Council for International Organizations in Medical Sciences (CIOMS).

The Committee on Bacterial Nomenclature was particularly productive in this period. A dozen reports had been submitted from the various subcommittees, and a few were published in Robert Buchanan's International Bulletin devoted to bacterial systematics. Significant progress was made in the classification of mycobacteria, and efforts made in assimilating the Bacteriological Code with the nomenclature of botanists and zoologists. A notable exception to these successful efforts was evident in the nomenclature of viruses. In his usual frank delivery, Vice-president Stuart Mudd wrote to Buchanan that, "I am not so sure that the viruses are ready for international codification as yet, nor am I sure that the virologists would pay much attention to an official nomenclature, even if formulated at this time."⁹¹

Accompanying the official invitations for the Seventh International Congress for Microbiology was the Executive Committee issued "manifesto" on the structure of international scientific congresses. The opening paragraph stated:

It is the view both of the International Union of Biological Sciences and the Executive Committee of the International Association of Microbiological Societies that the value of international congresses is endangered by their increasing hypertrophy – a hypertrophy that manifests itself in the excessive number of scientists attending, the large number of different sections within a congress and the general high cost to the organising country of the congress itself. The Executive Committee feels strongly that a small tightly organised International Congress for Microbiology should be held in the near future, at least as an experiment, which if it were successful, would provide a pattern for efficient international congresses in the future.

This declaration was most likely intended to answer any concerns that might arise in light of the limited number of allowed sections and papers. The "manifesto" also expressed the hope that the Congress would be financially self-sufficient, thereby explaining the unusually high registration fee for the Stockholm meeting.

Surprisingly, only a few national societies voiced objections to these changes. (A fact that did not prevent the Organizing Committee from printing on the front page of the daily congress newsletter an apology for the new restrictions). Although many societies were unhappy with the chore of limiting the number of members and papers, the reports from the organizing committee indicate that most were in compliance. The archives from the Stockholm Congress are remarkably complete. In a short pamphlet entitled "Data Concerning the VII International

⁹¹ Stuart Mudd, Philadelphia, to Robert E. Buchanan, Ames, 4 April 1956.

Congress for Microbiology,” the activities of the Organizational Committee are detailed, task by task, subcommittee by subcommittee, day by day. This chronicle reveals an unmatched efficiency in attending to the administrative details. By April of 1958, the Organizing Committee had received all the abstracts, successfully solicited financial support from private institutions, arranged social events, reserved additional transportation and communication lines, hired interpreters, and begun preparing the “prominence-list” that would decide which papers were to be presented and which were to be read by title only.

The Congress opened on Monday, August 4th, 1958. Approximately twelve-hundred participants, representing forty-five countries, attended. The scientific program was comprised of six sections: A) Microbial Physiology and Genetics, B) Microbial Chemistry, C) Immunology, D) Virology, E) Human and Veterinary Bacteriology, and F) Industrial Microbiology. Each section featured a symposium, held during the morning hours before the entire Congress. For example, Symposium I - “Recombination Mechanisms in Bacteria,” was held on Thursday at 9:00 a.m., and featured Joshua Lederberg as its moderator with four invited lecturers and five panel discussants. The other five topics were: Role of protein in nucleic acid synthesis and role of nucleic acid in protein synthesis; Tissue specific antibodies; Latent and masked virus infections; Germ free animals; and Continuous culture methods and their application.

The full symposia were published in one bound volume, aptly entitled Recent Progress in Microbiology, and provided without cost to each registered scientist. The preface to the published edition offers justification for a collected volume of dissimilar topics: The collection in one volume of six symposia covering fields seemingly remote from each other may, perhaps, seem of questionable value to the specialist. But this has appeared to us entirely in accordance with the very aim of all congresses: to furnish mutual insight and contact between different lines in present research. Although the different fields represented here may at first appear unrelated they have very essential principles in common The tools used in these efforts are to a great extent shared by all specialized branches . . .⁹²

Even the afternoon paper sections were presented in the format of a small symposium. For example, the section on Human and Veterinary Bacteriology devoted its Tuesday afternoon session to “Selective and Rapid Diagnostic Methods,” while its Thursday session discussed the “Influence of Irradiation on the Host-Parasite Relation.” In all, there were twenty-five such topics among the six sections with several adjunct meetings (*e.g.*, an informal symposium on the “microbiology of coal”).

Additionally, there were thirteen technical films and four special exhibitions: one scientific, one commercial, one for international microbiological journals and one Linnean exhibition. These exhibitions were noteworthy for several reasons. At the scientific exhibition, members contributed twenty-two small 'demonstrations' of their current work-in-progress, foreshadowing the arrival of the contemporary “Poster Session.” And while previous congresses included commercial exhibits, the Stockholm Congress was the first to provide an elaborate showcase of commercial technical equipment. The Linnean Exhibition was an usual addition to

⁹² Gosta Tunevall, “Preface,” Recent Progress in Microbiology, Symposia held at the VII International Congress for Microbiology, Stockholm, 1958 (Stockholm: Almqvist & Wiksell, 1959)

a congress for microbiology. Instead of merely printing a Congress badge or stamp with the image of the host country's preeminent figure in the history of microbiology, the Swedish delegation offered a comprehensive description of von Linne's work. The exhibit even included a display of original manuscripts from the master systematist.

The Congress was to be held in the Swedish House of Parliament. Unfortunately, Parliament was forced to sit unusually late that summer, and the sessions were moved to a building of the Royal Institute of Technology named "Sing." The Opening Ceremony was, however, held in the Concert Hall where the Nobel Prizes are annually presented.

The Plenary Session of the International Association of Microbiological Societies was, once again, notable. Held in the middle of the week, the entire Congress gathered across the water at Uppsala University. Among the more significant decisions was the creation of the Permanent Section on Food Microbiology and Hygiene, a Section on Microbiological Standardization, and the International Society for Human and Animal Mycology (ISHAM). These bodies were established in order to organize symposia and promote active communication among members of their subspecialties. Although they were still part of the International Association of Microbiological Societies, their creation set a precedent for forming smaller, more active branches of the Association. (In fact, the Food Microbiology and Hygiene Section had already organized four symposia before the Seventh Congress, with two more planned for 1958 and 1960.) In order to prevent future administrative dilemmas, the Executive Committee delivered a list of guidelines for the creation of new sections, including the stipulation that any new section would be subject to a trial period of at least two years.

Additionally, a Permanent Committee for Microbiological Documentation formed under the direction of J. Roger Porter. The committee aimed to standardize the use of statistics, terminology, and abstracts for those journals dealing with microbiology. These efforts were intended to facilitate cooperation with the ICSU Abstracting Board Executive Committee.

The administrative lessons of the previous five years precipitated other structural changes. A resolution was adopted providing funds, for the first time, for the expenses of the Executive Committee. In 1958, the Association had thirty-one national member societies, six working committees and two regional organizations. It was decided that the International Committee for Enteric Phage Typing would remain independent of the nomenclature committee, though many were relieved when the ICEPT submitted a new rules of procedure to replace the former constitution. In order to facilitate the distribution of grants for type culture collections, a member of the Nomenclature Committee was invited to act as a permanent advisor to the Executive Committee.

The Plenary Session closed with short orations from the President of the Congress, Sven Gard, as well as the newly elected President of the Executive Council, Stuart Mudd. Foreshadowing many issues that continue to confront microbiologists, President Gard discussed the obligations of scientists to society. He expressed apprehension at the dawning of an age where "scientists . . . are able to impress new characters on living beings, to transform if not form living matter, to create at will new species."⁹³ Gard did intend to advocate a retreat from genetic engineering, only issue a warning against the manipulation and secrecy imposed by some governments. In his presidential address, Stuart Mudd reviewed the manifold changes in the

⁹³ Sven Gard, "Presidential Address", *Recent Progress in Microbiology*, 9.

International Congresses for Microbiology. He reaffirmed the Executive Committee's support of smaller, tightly organized congresses. While expressing satisfaction that the Eighth Congress had been set for Montreal in August of 1962, he cautioned that proper planning for such an event required far greater time, and appealed to other countries to offer an invitation.

Many of the changes implemented at the Stockholm Congress were short-lived. Notwithstanding, the trend toward a more active, diversified Association was firmly established. Unlike its predecessor, preparations for the Eighth International Congress for Microbiology began early. By March of 1956 the Canadian National Research Council (NRC) had already named a Provisional Organization Committee for the Montreal Congress with Norman E. Gibbons as its chairman. Even before the Stockholm Congress officially closed and the Canadian invitation formally accepted, the dates and location had been firmly set. By the winter of 1958, an Executive Organizing Committee had been established, selecting E.G.D. Murray as President and Gibbons as Secretary-General, and set about the difficult tasks of selecting topics for sessions and symposia. (One should remember that selecting topics requires a good crystal ball. Symposia and sessions are decided two to three years in advance of the Congress and four years in advance of their publication. In order for the sale of the published symposia to be financially profitable, the choice of topics must be still pertinent almost a half-decade later.)

In keeping with the precedent set at Stockholm, the Organizing Committee set a limit on the number of participants, this time at two-thousand. The Program Committee, chaired by Robert G.E Murray, adopted many of the features of the Stockholm design (*e.g.*, choice of selected “focal topics,” morning plenary symposia, concurrent afternoon paper sessions), but with an increased number of symposia and a premium placed on covering topics neglected at the previous congress (*e.g.*, agricultural microbiology).

The Canadian Committee implemented a few enduring innovations. The site for the Congress was not a university, but the spacious Queen Elizabeth Hotel and technical displays were offered in addition to the commercial exhibits. The Program Committee suggested that time and space be provided for approved informal group meetings (scheduled outside of ordinary session times). One of the more interesting informal meetings heralded the coming of computer-aided numerical taxonomy (designated, at that time, as “taxometrics”).

With the memory of the Rome Congress lingering, participants were limited to one contributed paper; and, final acceptance of papers rested with the Program Committee. This policy effectively abandoned the former system of screening by national societies. Moreover, the first and second circulars indicated that all contributed papers should be limited to work which had not been published in recognized journals.

During 1961, the majority of administrative chores were accomplished; fees were decided (\$40.00 per), budgets approved (\$185,000), and program details and invitations to symposia mailed. One of the more difficult decisions concerned the publication of the full symposia. Murray believed that published symposia had recently been “done to death” and were of little worth to the general microbiologist. In fact, the Organizing Committee initially voted six to one **against** publication. However, as the congress neared, the members conceded that some widely available record of the Congress should be provided, and reversed their original decision.

When the Second Circular was mailed, the final program consisted of thirteen Symposia, four Panel Discussions and thirty-five Focal Topic Sessions. These divisions roughly corresponded to five sections: A) Structure and Function, B) Agricultural Microbiology, C)

Industrial Microbiology, D) Virology, and E) Medical and Veterinary Microbiology. Since this program was more complex than the previous congresses, the Organizing Committee sought technological help. A form was included with the Second Circular requesting that each delegate indicate the five Symposia and the eight Focal Topic Sessions in which he was most interested. With the aid of a specially programmed computer, the form aided in the construction of a schedule with the least number of conflicts.

The Permanent Executive Committee had been busy in the years between congresses. With President Stuart Mudd and Secretary-General Carl-Göran Hedén as its leaders, the Committee again revised the statutes of the IAMS. This time, however, the revisions were more for clarification rather than drastic reorganization. In the first Newsletter of the IAMS, published in March of 1962, the Executive Committee explained many of the new features of the Association. A mailing network was established, and national microbiological societies were being regularly informed not only of the IAMS activities, but also those of the IUBS, CIOMS, FAO and WHO. Rules for sponsorship of International Symposia by affiliated sections were outlined. Also included within the Newsletter was a chart explicating the relations and interrelations of IAMS with other international groups.

The Newsletter listed the proposed revisions in the statutes. The election procedure was detailed and provision made for filling vacancies. The composition of the Executive Committee was also expanded, with the Past-President and Past Secretary-General were included along with a single Vice- President. Additionally, an Advisory Council was created with the Vice-President as chairman, the Secretary-General, the chairmen of each recognized Committee or Section, and six members at large. The duties of the Advisory Council were to offer opinions to the Executive Committee when consulted or initiate discussion on its own.

The most important change in the statutes concerned finances. The Executive Council had been operating with very little money. In fact, there is ample evidence that a majority of the operating costs of the Executive Committee were paid for completely by the officers themselves. Stuart Mudd alone contributed over three thousand dollars to the treasury from 1958 to 1960. The new statutes made provision for a unit membership fee of fifty U.S. dollars and each member national society was asked to pay as many units as it deemed fit. The statutes also allowed private firms and individuals to become "Supporting Members" at the same unit cost.

The Congress opened August 19th, 1962 in the Grand Ballroom of the Queen Elizabeth Hotel. For the most part, the unfolding of the Congress proceeded smoothly, save one politically embarrassing omission. In a short memoir, Gibbons and Murray recount the *faux pas*: Flags had been obtained from the T. Eaton Co. to decorate the stage for the assemblies. They hung in profusion and we thought every country in the world must be represented. But alas, the day after the opening ceremonies, the Russian delegation reported their flag was not present and if not corrected immediately an official protest would be made. We were unable to find one in Montréal and in desperation phoned Fred Rosser at NRC to beg, borrow or steal one and get it down. He came through and the hammer and sickle arrived that evening by special car.⁹⁴

The official banquet was held on Thursday, with interesting toasts read by E.G.D Murray

⁹⁴ N.E. Gibbons and R.E.E Murray, "La Société Canadienne des Microbiologistes: Its Beginning and Some Highlights of the First Decades." Unpublished manuscript [TMs].

and A. Ashley Miles. Aside from delivering the pleasantries that are expected from the host president, Murray discussed the problems of overspecialization within microbiology. Noting that a division of labor among microbiologists was inevitable, and in fact profitable, Murray contended that progress would indeed be hampered if communication between the several specializations was lost. For Murray, the promotion of that communication, and microbiology as “an unrestricted science” was the exact purpose of the International Congress for Microbiology. In his reply on behalf of the visiting national societies, Miles contemplated how an association could possibly unify so many researchers from so many countries.

As had come to be the norm, Friday's General Meeting and Plenary Session was eventful. The proposed statutes passed without significant revision or discussion. A new Executive Committee was nominated with André Lwoff as President, Carl-Göran Hedén as Vice President, Norman Gibbons as Secretary-General, and V.D. Timakov Member-at-large. Maurice Welsch continued his reign as Treasurer and Stuart Mudd remained on the Executive Committee as the immediate Past-President. Members for the Advisory Council were also selected, with many representing countries not on the Executive Committee.

Since the sections and committees of the IAMS had been busy, there was much for Secretary-General report. The Permanent Section for Microbiological Standardization reorganized and already held five meetings (Brussels 1958, Jerusalem and Opatija 1959, Wiesbaden 1960, and London 1961) devoted to the standardization of serums, vaccines, and other substances prepared from biological material. The Permanent Committee for Microbiological and Immunological Documentation continued preparing a comprehensive list of all journals dealing with microbiological issues. And, the Permanent Section on Food Microbiology and Hygiene began focusing its efforts on the microbiology of frozen foods in association with the FAO Freedom from Hunger Campaign.

The most noteworthy addition to the organization of the IAMS was the creation of a Section on Economic and Applied Microbiology. The Section, and its proposed symposium on “Global Impacts of Applied Microbiology,” addressed areas of aerobiology, applied immunology, fermentation, and soil and water microbiology. The GIAM Conference (as it had come to be known) was scheduled for Stockholm, in late July 1963, and its organizers hurriedly sought suggestions for topics and speakers.

The participants of the Eighth Congress departed with words from the Secretary-Generals. Newly-elected Norman Gibbons warned against the dangers of ephemeral support for new sections. He issued a brief statement reading: “it is the feeling of the Executive Committee that these should not be set up unless there was adequate interest and a cadre of persons who are willing to provide the necessary impetus and to assure that the proposed section could perform a worthwhile function in the organization.”

In the decade that separated the closing of the Rome and Montréal Congresses, the International Association of Microbiological Societies had been radically revised. From an organizational standpoint, the IAMS was in a position to aid substantively in the development of international microbiology. But there was also a realization that such efforts would not come easily. Before he was officially replaced, Carl-Göran Hedén remarked: I should like to make the concluding general statement that in the life of the Association the period 1958 to 1962 has represented a phase of consolidation. This has covered both inner organization and the relations with the major international organizations. It now remains for the

delegates to decide how the instrument, which the Association now represents, shall be handled to the maximum benefits of microbiology and mankind.⁹⁵

⁹⁵ Carl-Göran Hedén, “Addendum,” Recent Progress in Microbiology: Symposia Held at the VIII International Congress for Microbiology, ed. Norman E. Gibbons (Toronto: University of Toronto Press, 1963).

CHAPTER 5 AN EFFECTIVE ORGANIZATION

In the twelve years that followed the closing of the Seventh International Congress for Microbiology, the International Association of Microbiological Societies became a truly modern scientific organization. Those factions within the IAMS that sought to limit the Association's authority to organize international congresses were no longer vocal. By 1968, the sectional activities between congresses assumed greater importance, in many ways overshadowing the role of the periodic congresses themselves.

The organizational growth of the IAMS during the 1960's was in large part due to the efforts of its Secretary General, Norman E. Gibbons. As Secretary, Gibbons coordinated and centralized nearly every function of the IAMS. While many decisions were not made by the Secretary General, most were made through him. His office served as locus of coordination between the members of the Executive Committee, the Organizing Committee for the Ninth Congress, the Chairmen of the Committees and Sections, and the hundreds of individuals from the thirty-seven national member societies. The archives of the International Association of Microbiological Societies contain copies of over two-thousand letters written from his desk; many more were received by Gibbons. He made it a point to be informed of and involved in every important issue.

The letters speak to the frankness of his language. Gibbons was candid in his correspondence, with his more acerbic responses reserved for members of the Nomenclature Committee. The pen of Norman Gibbons also contained more than an inkling of humor and light sarcasm. When asked about the desirability of holding a taxonomy conference in a Czech castle, his first direction was "better check the plumbing." A fellow Canadian microbiologist wrote to him inquiring who was the Secretary General of the fine IAMS. Gibbons responded, "Dear Andy: Flattery will get you nowhere and this is particularly true for those who admit not to know the name of the Secretary-General of the IAMS." More importantly, Norman Gibbons held a genuine concern for the growth and development of the IAMS. He devoted countless hours to a difficult job that was often without financial reimbursement.

Secretary Gibbon's extended tenure afforded him the opportunity to create an administrative structure of the IAMS that could accommodate its increased organizational duties. Initially, Gibbons opened new lines of communication between the Executive Committee, IAMS Sections and Committees, and the national member societies. An IAMS newsletter was distributed on a periodic basis and a directory of addresses for IAMS national societies, working committees and sectional presidents was published. Secondly, the Executive Committee maintained a frantic pace between the Montréal and Moscow Congresses. While they only held two committee meetings (in July of 1963 and April of 1966), hundreds of decisions were made by post.

The expansion and consolidation of the International Association of Microbiological Societies included strengthened ties to other international scientific organizations. One of the more extensive joint efforts was the UNESCO sponsored Microbiological Decade. Modeled after the Geological Decade and affiliated with the International Biological Program (and the

International Cell Research Organizations), the UNESCO project intended to promote the spread of applied microbiological techniques to developing nations. The original proposal for the Microbiological Decade came from members of the Japanese National Society in a circulated document entitled “Promotion of Research in Micro-organisms.”

While the Executive Committee was caught unprepared by the unannounced launch of such an ambitious project, Gibbons and others realized that the Microbiological Decade might be a suitable vehicle for expanding the role of the IAMS as well as obtaining further financial assistance for many activities. The Microbiological Decade called for a broad range of activities, including the establishment of an international network for the preservation and exchange of culture collections. Also, the program sought to assist the research and training of scientists in developing nations. It is therefore not surprising to find that the newly created Section on Culture Collections involved in the planning. Unfortunately, the proposed Microbiological Decade failed to receive full UNESCO approval, and many of its programs were moved to the more general funding category labelled “Fundamental Biology.”

Alternatively, the International Biological Program of UNESCO, broadly focused on the “Biological Basis of Productivity and Human Welfare,” expanded to include numerous microbiological issues (*e.g.*, nitrogen fixation, yeast production, and “microbial means of human adaptability.”) The IBP was not without its detractors. In a newsletter of the IAMS (June 1964), Gibbons summarized the three-fold critique: 1) that the IBP did not do enough, 2) that it was not all necessary and 3) that it really was a mosaic of established national projects and hence neither new nor truly international. While the criticism was prevalent, it did not seem to hinder the IAMS's involvement in the IBP. The IAMS component of the International Biological Program included a series of training courses held in collaboration with the International Cell Research Organization on such topics as “Modern Techniques of Microscopy,” “The Genetics and Physiology of Bacterial Viruses,” “Membrane Biophysics,” and “Interaction between Animal Viruses and Host Cells.” The IAMS also called for the establishment of a Technical Information Service in order to construct a list of vaccines, a registry of strains with antigenic properties and a comprehensive file of vaccine manufactures.

These activities closely paralleled that of the Permanent Section on Economic and Applied Microbiology (EAM). Established at the 1962 Montreal Congress, the EAM arranged the First Conference on Global Impacts of Applied Microbiology (GIAM) in Stockholm, 1963. From its inception, the EAM furthered the transfer of applied microbiological techniques to the developing world.

As early as 1963, the issue of biotechnology occupied a central concern of the EAM. At the First GIAM Conference, the section recommended the establishment of a “chain of cooperating laboratories in biotechnology,” the purpose of which would be to (a) initiate training programs in biotechnology, (b) exchange personnel with specific regard for increasing the biotechnological research potential of developing nations and (c) be responsible for specific research in biotechnology.⁹⁶

Unfortunately, a number of administrative difficulties delayed these proposals. The eager

⁹⁶ “Section on Economic and Applied Microbiology,” Business Proceedings: IX International Congress for Microbiology, Moscow, July 24-30, 1966, International Association of Microbiological Societies, March 1968, 48-9.

directors of the EAM quickly discovered that UNESCO and ICRO were far more adept at creating new panels than supplying new money. Consequently, IAMS involvement was limited to the passage of joint resolutions, such as the ICSU Committee on Space Research (COSPAR) proclamation that all space vehicles be adequately sterilized.

Moreover, the Section on Economic and Applied Microbiology suffered an administrative setback of its own. The Second Conference on Global Impacts of Applied Microbiology was scheduled for 1967 in Rabat. Unfortunately, in 1966, Morocco placed a series of travel restrictions which precipitated a withdrawal of UNESCO funding for the GIAM conference. Though the Section on Economic and Applied Microbiology devoted several frustrating months in search of a suitable site for the next GIAM, it remained nonetheless committed to distributing the benefits of microbiology to the developing world.

There were other active sections of the IAMS besides the EAM. A Section on Culture Collections had been created at the Ottawa Conference that followed the 1962 Eighth International Congress for Microbiology. For the Executive Committee of IAMS, the issue of culture collections had long been a source of bureaucratic confusion. By welcoming the creation of a new administrative body, the Executive Committee hoped to preclude the recurrence of past chaotic events. Extensive enquiries were made into the structure of Paul Hauduroy's "Lausanne Center" and the fate of the original International Federation of Culture Collections. Both of these bodies were affiliated with the IAMS in the early 1950's, but by 1958 no longer communicated with the Executive Committee. The Section on Culture Collections was fortunate to find Hauduroy willing to collaborate with its efforts.

Furthermore, the Section on Culture Collections assumed the additional duty of allocating IUBS and UNESCO funds for culture collections. Since 1958, the Executive Committee itself (with the help of a loosely defined "advisory committee") performed this task, and occasionally drew justifiable criticism. With the creation of a specialized body for culture collections, the Executive Committee believed that the small amount of outside support would be judiciously distributed.

Between the Montréal and Moscow Congresses, some sections of the IAMS were able to organize important symposia and conferences. The Permanent Section on Food Microbiology and Hygiene (through its Committee on Microbiological Specifications for Foods) held three international meetings devoted to such topics as "Microbiological Specifications and the Methods of Analysis for Irradiated Foods." The Section on Microbiological Standardization sponsored two Congresses and twelve symposia. The proceedings of these gatherings were published and appeared as single volumes devoted to persistent problems (*e.g.*, smallpox vaccination, sterility testing, neurovirulence, adjuvants). This section was unquestionably the most productive and widely represented body of the IAMS, with one-hundred and eighty participating members from thirty-six countries. Impressively, it was able to organize two international symposia a year, and in 1964 established the important Committee on Cell Cultures to study the problem of *in vitro* substrates for virus growth.

The Permanent Committee for Microbiological and Immunological Documentation was not as fortunate. Established at the Rome Congress, the Committee was created in affiliation with International Council of Scientific Unions' Abstracting Board. Under the directorship of P.R. Brygoo, the Committee spent nearly a decade assembling a "World List of Periodicals Relevant to Microbiology." Unfortunately, there were insufficient funds available to publish the

comprehensive collection. In fact, by 1966, there was concern that such a Committee for Microbiological and Immunological Documentation would be rendered obsolete by the computer abstracting services looming on the horizon.

Efforts toward establishing regional associations for microbiology achieved moderate success. Support for the European Association waned considerably by 1963. However, national societies from ten countries agreed to the formation of La Asociacion Latinoamericana de Microbiologia. The Latin American collaboration held its first congress in December of 1964, in Bogota, Columbia, and was attended by well over four-hundred microbiologists.

The Ninth International Congress for Microbiology, in turn, was set for Moscow in 1966. Even though a tentative invitation was offered and accepted at the close of the Montréal Congress, the issue was not fully settled. In fact, for a few weeks, President André Lwoff weighed informal invitations from Israel, Spain and Mexico, until an official invitation from the Soviet Union was received on October 26th, 1962. While the Executive Committee accepted the offer, there is ample evidence of residual uneasiness. The Soviet Union had only recently become involved in the International Association of Microbiological Societies, having passed up four of the previous five congresses. Consequently, there was a underlying sentiment that the Soviet microbiologists and the Academy of Medical Sciences might be unfamiliar with the administrative tasks involved in hosting a large international congress. In December of 1962, Secretary Gibbons sent Victor M. Zhdanov, Secretary-General for the Congress, a rather detailed outline of the decisions made in preparation for the Montréal Congress.

There were no signs that Zhdanov and President of the Congress, V.D. Timakov, were offended by the Executive Committee's concerns. In fact, their reaction was quite to the contrary. Zhdanov and Timakov requested frequent involvement of the Executive Committee and even suggested the creation of a "congress consulting committee." In an unprecedented move, the Soviet organizing committee submitted its list of focal topics and symposia speakers for the approval of the Executive Committee. If any criticism could be levied against the Soviet committee, it is that they were often too accommodating. Gibbons wrote to Zhdanov insisting that he not submit to pressure to expand the scope of the Congress to include many "peripheral issues" (*i.e.*, aquatic microbiology, numerical taxonomy, etc.)

However, it would not be accurate to claim that the planning for the Moscow Congress was without any unusual features. Most noticeably, there was minimal communication between Moscow and the IAMS. There were repeated instances when letters from members of the Executive Committee and National Societies went unanswered. Predictably, Secretary-General Gibbons found this lack of correspondence enduringly frustrating. Often, he would be forced to explain to anxious IAMS members that the Soviets were just not accustomed to the ceaseless communication that had become custom among the Association. And, in November of 1964, Gibbons asked that Lwoff reconsider his selection of Zhdanov as representative to CIOMS, believing that the periodic silences would only damage IAMS relations with other bodies.

It was not until October of 1964 that the dates for the Congress were announced (thereby jeopardizing American and Canadian governmental support for their microbiologists). Additionally, members of the American Society for Microbiology were concerned that they did not know much about Soviet microbiology, and thus were unlikely to make informal contacts with Eastern Bloc scientists. Bacteriologist J. Roger Porter requested that the Congress Organizing Committee provide booklet containing a list of Soviet microbiologists and regional

labs as well as an explanation of the structure for the Academy of Medical Sciences. Porter explained to Gibbons that such information was essential to “have some acquaintance with things so most people do not make fools of themselves over and above not knowing their language.” Porter admitted: “I suppose in a way this is an insult to their intelligence because we should know some of these things. But I believe that most Russian scientists realize that there was a closed door policy for a long time, and that few westerners are masters of their language.” This problem was compounded by the fact that neither the National Academy of Sciences nor the Library of Congress could produce any published account of science in the Soviet Union. The only comprehensive data on the members and structure of the Academy of Sciences was in the hands of the Central Intelligence Agency, an organization unlikely to cooperate with Porter and the American Society for Microbiology (ASM).

Secretary Gibbons wrote to Zhdanov in July of 1965 inquiring whether an information booklet could be put together. Curiously, there was no reply for several months, and a few American microbiologists continued to press the Executive Committee. For example, Frank Engley of the University of Missouri contended that many of the past Soviet Congresses had been “a real waste of time and money, since too many of Congress goers did not get to meet many of the Soviet scientists at the meetings, had no opportunity to plan visits to university laboratories or other institutes, etc.” In addition, Engley suggested that the National Library of Medicine was eager to construct a comprehensive booklet on Soviet science, if they were only provided with the basic data.⁹⁷

In January of 1966, Gibbons again wrote to Zhdanov, this time including some of the letters he himself had received. One month later, President of the Congress V.D. Timakov, wrote a curt reply, indicating that a brochure was being prepared and that restrictions would not be placed on any microbiologist interested in visiting Soviet scientific institutions.

A more troublesome issue in the planning for the Moscow Congress was the Soviet insistence that no scientific meetings be held after the closing session. At the previous three congresses, it had become customary to conduct 'para-congressional' meetings before and after the congress. Usually, the week preceding was dedicated to official meetings of the Committees and Sections of the IAMS, while the week after the congress featured larger conferences devoted to broader areas of interest (*e.g.*, the 1962 Conference on Taxonomy in Ottawa).

The Soviet decision placed the bacterial taxonomists in a quandary. The scientific program for the Congress offered little for those interested in taxonomy; there were no sections and few focal topics sessions. Understanding that many of their members would be occupied the week before the Congress with meetings of the Nomenclature Committee, several taxonomists expectantly looked for a post-congress conference. When it became apparent that the Soviet organizing committee would not alter its policy, there was talk of holding a taxonomy meeting in Czechoslovakia. However, even the Czechoslovakian conference did not survive the initial stages of planning. Participants could not agree on format and size, and a few influential members of the nomenclature committee feared that a conference in another Eastern Bloc country was diplomatically insensitive. These objections were most forcefully voiced by Robert Buchanan, although Zhdanov reacted with understanding. Buchanan also believed that such a meeting could not make binding decisions without violating the statutes of the International

⁹⁷ Frank Engley, Columbia to Norman Gibbons, Ottawa, 3 December 1926.

Committee on Bacterial Nomenclature which specified that all agreements be ratified at an IAMS Congress.

The organizational chaos of the bacterial taxonomists was mirrored in the efforts of the newly established Provisional Committee for Virus Nomenclature (PCNV). For nearly a decade, members of the Subcommittee on the Nomenclature of Viruses pursued structural independence from the International Committee on Bacterial Nomenclature. Arguing that their concerns and techniques were distinct from the bacterial arena, virologists succeeded in forming a committee of own in 1964. However, the simple creation of a committee was not a panacea for all of their problems. From 1920 to 1960, the path toward a unified bacterial nomenclature was fraught with disagreement and difficulty. It is little wonder that virologists found their task even more formidable, although “it was generally felt that virologists should not be left in a nameless vacuum and that enough knowledge had accumulated for virus systematics.”⁹⁸

In a 1965 meeting in Paris, the PCNV could agree to only three simple resolutions:

1. The bacteriological code should not be applied to viruses. (Carried unanimously)
2. Virus nomenclature should be internationally adopted. (Carried)
3. Virus nomenclature should be applied to all viruses. (Carried)

When the International Committee for Nomenclature of Viruses (ICNV) began its deliberations one week before the opening of the Moscow Congress, it became painfully obvious that there was little conceptual agreement as to the methods or goals of virus nomenclature. Many believed that until such agreement had been reached, any committee would be unavoidably counterproductive. (As President of IAMS Lwoff remarked, “the worriers are now assembled in Moscow and ready to begin the fight.”)

If some consensus were to be established, it would only be by fiat. For example, several members advocated a binomial system, but later were informed that only 5% of plant viruses were (thought to be) classifiable in that manner. At times, there were fierce confrontations (as to whether the names would in the vernacular or latin) while other issues evoked remarkable indifference (99% of American virologists polled felt that nothing should be done).

Invariably, the meetings deteriorated. Virologists from Denmark and Australia insisted that their systems were unfairly ignored and several reprints were hastily distributed. British virologist Peter Wildy dispatched the primary conceptual blockade: Nomenclature and classification have to go together; otherwise there is no value to giving names. But since no virus phylogeny is possible or known, we cannot name viruses.⁹⁹

Traditionally, nomenclature and classifications had been linked. A latin binomial name did not merely identify an organism, it provided information about relations to others in the same genus. If phylogeny could not be known, the committee was faced with the obligation of selecting names and classifications purely on an instrumental basis, a task that some researchers viewed as unproblematic (*e.g.*, Lwoff and the British representatives).

The pre-congress meetings ended with minimal agreement and three additional resolutions were adopted.

⁹⁸ Karl Maramorosch, “Informal Detailed Report from the IX International Congress for Microbiology and the International Committee on Virus Nomenclature.” Unpublished manuscript [Tm] photocopy.

⁹⁹ *Ibid.*, 3.

1. This Committee considers that an international nomenclature for viruses is desirable.
2. Efforts should be made toward a latinized binomial nomenclature of viruses.
3. If and when Latin binomials are introduced, the existing names should be retained whenever feasible.

The Structure of International Committee for the Nomenclature of Viruses (ICNV) was patterned after the International Committee for the Nomenclature of Bacteria (ICNB). An executive committee was chosen (with Peter Wildy as president and four life members, including Lwoff and Zhdanov) and was empowered to carry out many of the duties of the judicial commission. It is curious to note that only one of the voting members, Britain's A.J. Gibbs, was a plant virologist. Gibbs, in turn, perceived significant conceptual differences between himself and the other animal virologists, and felt obliged to hound ensuing committee discussion with lengthy and vociferous objections.

Even though a taxonomic consensus was entirely absent, the executive committee of the ICNV began construction of an International Code for the Nomenclature of Viruses. Four significant propositions were debated and passed:

1. The law of priority is not to be observed
2. New sigla will not be introduced
3. No person's name, living or dead, will be used for a virus name
4. No nonsense name will be used for naming a virus.

The committee admitted that “all classifications are, of necessity, arbitrary, and that nature does not make strictly defined categories, so that the new system will not be perfect.”¹⁰⁰ They embarked on their journey with broad definitions of virus *species* and *genus*, and the construction of four working subcommittees (for viruses of invertebrates, vertebrates, bacteria, and plants). The committee offered the General Assembly of the Moscow Congress a vague hope and an agenda of issues for the Symposium on the Classification of Viruses.

The structure of the Moscow Congress closely paralleled that of its predecessor in Montréal. The week before the Congress was devoted to meetings of the several committees and subcommittees, a task that was, in many ways, more complicated than the actual congress. Once a preliminary schedule of meetings was distributed in early April of 1965, Gibbons and Zhdanov were overwhelmed by requests for additions, deletions and changes. (Also held that week was the Tenth International Congress for Microbiological Standardization.)

The scientific program of symposia and paper sessions of the congress was divided into seven sections: Physiology and Genetics of Microorganisms, Chemical Activities of Microorganisms, Industrial and Agricultural Microbiology, Medical and Veterinary Microbiology, Virology, Immunology, and Epidemiology. The inclusion of an agricultural section was particularly important given the neglect of this area during the past two congresses. Each section contained one or two symposia (or panel discussions) and four to five focal topic sessions (for individual papers). Paper abstracts for most of the symposia and focal topics were published before hand, although two symposia were not included in the pre-congress publication, and one symposium, made up of four papers, was not held.

Two general lectures were given, one by IAMS President and Nobel-laureate André

¹⁰⁰ Maramorosch, 9.

Lwoff on “Effectors of Primary Virus Infection” and the other by Soviet microbiologist P.F. Zdrodowski entitled “Basis for Template-Genetic Theory of Immunogenesis and Neurohumoral Regulation of Antibody Formation.” The Moscow officers received over 1,500 abstracts from nearly 4,000 registrants. Of those submitted, 1,400 were printed and roughly half chosen for the focal sessions (some to be read by title only.) In order to accommodate this unprecedented number of papers, authors were allowed only eight minutes for presentation and two for discussion.

The Congress opened on July 24th, 1966, at the Moscow State University on Lenin Hills. The events were officially sponsored by the Scientific Medical Mechnikov's Society of Epidemiologists, Microbiologists and Infectionists and the Microbiological Society of the USSR. In many respects, the Moscow Congress reflected the thirty months of detailed planning. For example, the Organizing Committee provided simultaneous translations for many of the symposia. Unfortunately, participants had difficulty moving from one scientific session to another because the schedules were not published, but rather posted on large bulletin boards. Additionally, some participants found it difficult to get in touch with friends and colleagues because no central registry was available.

The worries of J.Roger Porter and other Americans were alleviated. Not only was a brochure distributed detailing the structure of the Soviet institutes of microbiology and its member scientists, numerous excursions to research laboratories were offered without charge. It appears that Timakov and Zhdanov made real efforts to encourage open intellectual exchanges between scientists from Communist and non-Communist countries. Unlike early Soviet congresses, photographing and filming were not discouraged. Also included at the Congress was an International Exhibition of Equipment and Literature held at Sokolniki Park displayed various Soviet scientific apparatus, laboratory equipment, reagents, drugs and textbooks.

The opening and closing ceremonies were held in the lavish Kremlin Palace of Congresses. The auditorium seated over 6,500 and it was filled for the opening ceremony on July 24th. The welcoming addresses reiterated one of the enduring goals of international microbiology: to provide connections and cross-fertilizations among the various sub-fields within microbiology.

Contemporary science is characterized by a combination of two contradictory tendencies. On the one hand, differentiation of previously united fields of knowledge takes place, an example of which can be shown in microbiology. Participating in this Congress are specialists of very distinct branches, for instance those studying genetics of bacteriophages and epidemiology of small-pox, seem to speak in different tongues although in both cases their subject of study is the virus. On the other hand, there is the tendency to create synthetic branches of knowledge, which is exemplified by molecular biology broadly represented in this Congress by microbiologists, biochemists, biophysicists, geneticists, and other specialists whose subject of investigation is the microorganism.¹⁰¹

While the International Association of Microbiological Societies and its congresses had inevitably splintered into sections representing smaller divisions, there was a lingering belief that

¹⁰¹ V.B. Petrovsky, “Forum of Microbiologists of the World,” Medical Newspaper 60 (26 July 1966), 2434. Translation from Russian by Victor M. Zhdanov.

a gathering of every specialty could provide information useful to all.

Many of the symposia attracted considerable attention, and the discussions that followed were brief, but lively. For example, the symposium on viral classifications was attended by approximately six-hundred and fifty people, with another two-hundred listening by radio receivers. Both the president of the IAMS (Lwoff) and Secretary-General of the Congress (Zhdanov) presented papers. The disagreements of the previous week's ICNV meetings resurfaced, this time raising many more issues. Among the virologists who were not voting members of the ICNV, there was general sentiment that the common-use names should be kept. As expected, many microbiologists objected to the Committee's decision to abandon a host-based classification in favor of a nomenclature of chemical and morphological characteristics.

In particular, three talks provoked the most vocal disagreements. Karl Maramorosch from the Boyce Thompson Institute in Yonkers, New York, described the special problems of plant viruses, contending that the ICNV proposals neglected entirely the requirements of insect and plant virologists. The other controversial presentations were given by British researchers B.D. Harrison and Peter Wildy. They strongly advocated Gibbs' system of cryptograms as a temporary means of nomenclature. The new designation would consist of two parts. A stable name (the traditional, popular name for a virus) and a changing cryptogram that indicated some general properties of the virus. Specifically, the cryptogram would consist of four symbols designating: the type of nucleic acid, the molecular weight of the nucleic acid, the shape of the virus particle and nucleocapsid, and the kind of host and vector. Because the system was encoded, it appeared more complex than necessary. For example the herpes simplex virus had a cryptogram of D/2:74/*:S/S:V/0 (Double stranded DNA, molecular weight of 74, spherical particle and nucleocapsid, with vertebrate host and no vector).

The cryptogram system, however, was so far removed from the traditional techniques of animal and plant taxonomy that the majority of the ICNV members did not support the proposal. Yet, the British defense left many listeners with the impression that some detailed program of temporary nomenclature was essential, no matter how novel its construction.

There was much to discuss in the General Session of the Congress. Secretary Gibbons lobbied for several changes in the IAMS, including the creation of a permanent secretariat, the reduction of annual fees (in order to encourage more timely payments), and a fair distribution of private donations. But support for more dramatic structural changes in the IAMS was brewing. There were calls for the creation of a section on immunology and one for virology, but Gibbons and Lwoff believed that those fields were adequately represented by the current IAMS arrangement. Once again, there was some concern over the intervals between congresses. The International Union of Biological Societies suggested that congresses occur at six year intervals. The majority of the IAMS felt otherwise and merely postponed further consideration of the issue until the next Executive Committee meeting.

Fortunately, the Executive Committee was able to avoid a few past administrative catastrophes. Unofficial offers to host the Tenth International Congress for Microbiology were received from Israel, Czechoslovakia, Spain, and Mexico. Based on an informal survey of its members, the Executive Committee chose Mexico City. "In order to ensure a stability, which might otherwise be jeopardized by the fact that no less than three new members will have to join the executive committee (replacing the Past-President, the Treasurer and one member at large)," the nominating committee recommended that Lwoff and Carl-Göran Hedén run for second terms

with Zhdanov serving as President-elect. These recommendations were accepted by acclamation, and required only minor reinterpretations of the IAMS statutes (Zhdanov was to take office at the 1970 Mexico City Congress).

In another interesting organizational development, the IAMS reviewed its role in the International Union of Biological Societies. The Executive Committee decided to apply for divisional status within the IUBS. While the change from a Section to a Division was largely symbolic, there was some concern about possible difficulties. Gibbons wrote to Zhdanov, "We have heard that there may be some opposition, particularly from botanists who still feel microbiology is a part of their discipline."¹⁰²

The success of the Congress was slightly blemished by the introduction of political and nationalistic issues. Only a few short weeks before the opening of the Congress, a rumor circulated on both sides of the Atlantic that the Congress had been canceled. In a series of frantic telegrams among the members of the Executive Committee, Zhdanov was finally contacted, and the rumor put to rest. Its origins are unclear, but there is good indication that Gibbons received word from the Executive Secretary of the American Society for Microbiology. Apparently, an American working in Paris had written a colleague in the States informing the latter that he did not need to prepare his paper as the Congress had been canceled.¹⁰³ There was considerable alarm within the ASM since it was responsible for two chartered planes involving over \$100,000. Zhdanov's reply plainly asked that Gibbons ignore this "wicked rumour which originated in the USA."

Additionally, the Turkish society for Microbiology was unrepresented at the Moscow Congress. The archives contain nearly a dozen letters from Istanbul doctors Z.M. Tuncman, Semih Tuncman, and Senise Gok requesting circulars and invitations. Four times Gibbons wrote to the organizing committee on their behalf. Oddly, none of these efforts drew a response. Because the Turkish scientists lacked official invitations, they were denied entry visas by the Russian consulate. The causes of this neglect remained unspecified.

A more public event involved the opening ceremony of the Ninth Congress. The invited Soviet dignitary was the Minister of Health, Dr. B.V. Petrovsky. A portion of the Minister's speech accused the United States of aggressive, imperialistic activities in bombing North Vietnam, and of using chemical weapons. He called for all scientists to "unite to stop this inhumane action of the United States." Not surprisingly, the United States delegate, William B. Sarles, protested before the Executive Committee. In a tersely worded letter, Sarles remarked: It is our opinion that the Minister of Health of the U.S.S.R. should not have injected political views into a program held to welcome microbiologists from all over the world. We believe that making the accusations was impolite and improper because this is a Congress held to consider and discuss scientific matters.¹⁰⁴

The reaction of the Executive and Moscow Organizing Committees was both diplomatic and sincerely apologetic. No official response, however, was published. Immediately following the close of the Congress, Gibbons wrote Sarles, indicating that:

¹⁰² Norman E. Gibbons, Ottawa to Victor M. Zhdanov, Moscow, 9 May 1967.

¹⁰³ Norman E. Gibbons, Ottawa to Victor M. Zhdanov, Moscow, 28 June 1966.

¹⁰⁴ William B. Sarles, Moscow to Norman E. Gibbons, Moscow, 28 June 1966.

The Executive Committee expressed its regret that the Minister of Health of the U.S.S.R. mentioned Vietnam and the United States at the Opening Ceremonies of the Congress. The matter was discussed with Drs. Zhdanov and Soloviev and they, too, have expressed regret. The Minister was invited as a guest speaker and his remarks in no way represented the attitudes or policy of the Organizing Committee.

Gibbons rationalized that the Executive Committee could take no official action on statements made by non-IAMS members. Further, Gibbons assured Sarles that the statements would not be printed by the Soviet press covering the Congress, and hoped that Sarles would limit exposure of this event in the American press.¹⁰⁵

Unfortunately, the American Embassy got word of this incident and submitted a public protest to the Minister's actions. The American journal Science considered publishing a lengthy account of the action, but its editor, Philip Abelson, cautiously solicited opinions from the Congress participants. Both Sarles and Gibbons implored Abelson not to draw unnecessary attention to the Minister's remarks. Gibbons eloquently explained:

I hope that before publishing material of this kind "Science" will consider that matter very carefully. I think I am expressing the views of the Executive Committee of the International Association of Microbiological Societies when I say that no useful purpose would be served by rehashing the incident. Although scientists must take an interest in politics, their first interest should be science. Science now furnishes one of the few bridges between nations, regardless of political views, and scientists should be the last to weaken the structure in any way. To cite this incident, or those that occurred at other congresses, will, in my opinion, only lower the prestige of "Science" and harm science generally.¹⁰⁶

Rather, Secretary General Gibbons referred the question to the President of the International Council of Scientific Unions, J.M. Harrison, in the form of the following executive minute: It is recommended that the Organizing Committee of an International Congress be urged to take steps that no attack on, or criticism of, a nation is made by members of the Organizing Committee or by invited speakers.¹⁰⁷

This resolution, with slight modifications, was adopted unanimously by the ICSU Executive Committee at its October 1966 meetings.

The Ninth International Congress for Microbiology raised another recurrent issue. There were many observers who believed that the Moscow Organizing Committee impeded the important trend toward limiting the size and scope of Congresses. In fact, the IAMS was not alone in this dilemma. A report from the trade journal Food Manufacture indicated: One wonders whether the day of these mammoth congresses is not over. The experiences of those returning exhausted not only from Warsaw but also from the Dairy Congress in Munich, the Nutrition Congress in Hamburg, and the Microbiology Congress in Moscow – all held this summer – indicate that such events have ceased to be occasions where scientists can exchange

¹⁰⁵ Norman E. Gibbons, Moscow to William B. Sarles, Madison, 29 August 1966.

¹⁰⁶ Norman E. Gibbons, Ottawa to Philip H. Abelson, Washington, 6 October, 1966.

¹⁰⁷ Norman E. Gibbons, Ottawa to J.M. Harrison, Ottawa, 29 August, 1966.

ideas in a pleasant relaxed atmosphere, and have become instead grim tests of endurance. The spread of knowledge is not as efficient as it might be under these circumstances, and one of the main excuses for attending such events – namely that one has the opportunity of meeting co-workers in one's own field – loses much of its point when the number of those attending runs into thousands.¹⁰⁸

Norman Gibbons pondered these issues over the course of the next few months, only to find calls for change from all sides. An editorial written by Lilly Industries research director J.J.H. Hastings succinctly stated the current dilemma.

One is left with a feeling of surfeit that only time and more leisurely reading of abstracts and proceedings will overcome; and though our Russian friends gave their hearts and minds and many weary hours to the creation of this magnificent monster, there must be a better way of doing this thing. The fault was not in Moscow. It was long before. The IAMS must learn to match its responsibilities to the times we live in [sic].¹⁰⁹

In January of 1967 Gibbons composed and distributed a three page report entitled “International Congresses: an Assessment and a Proposal.”¹¹⁰ Insightfully, Gibbons identified the essential tensions of organizing international congresses. The functions of the Association and its member societies were best served by large congresses, where microbiologists from each nation could be represented at the meetings of the committees, subcommittees, sections and general assembly. But the benefits to the individual scientists (from making personal contacts, presenting findings, and discussing work) were more easily attained at small gatherings. The single, though not insignificant benefit to the individual scientist at the gigantic congresses was that “he meets a wider circle of people from whom he may get ideas through cross-fertilization.”

As to the scientific content of the congresses, Gibbons offered two suggestions. He agreed with other observers that the symposia were the most profitable features, and hoped that future congresses would avoid topics covered by outside gatherings (*e.g.*, sectional congresses or symposia sponsored by other organizations) and focus instead on otherwise neglected areas. Gibbons also advised that the number of speakers be reduced to allow more time for discussion. In his usual attention to details, Gibbons even devoted a few paragraphs to type of food that ought to be served: “Some basic dishes tastefully presented must be included with sufficient more exotic items to make it interesting.”

The focal topic paper sessions presented a more delicate set of problems. It was generally agreed that too many papers were presented with too little merit. However, a more competitive selection was not a palatable alternative. Presentation of a paper was often considered a prerequisite for attendance by the institutes or governments sponsoring delegates. Additionally, many organizing committees were reluctant to “offend” any national society by rejecting a high percentage of their papers. Gibbons, however, was insistent that some change

¹⁰⁸ “The Next Congress -- Washington,” Food Manufacture (October 1966), 30.

¹⁰⁹ J.J.H. Hastings, “Ninth International Congress for Microbiology,” Process Biochemistry (November 1966): 447-8.

¹¹⁰ Norman Gibbons, “International Congresses: an Assessment and a Proposal,” 9 January 1967. Unpublished Manuscript [TMs].

occur. In addition to employing greater selectivity, he suggested that the abstracts be published two months in advance, affording ample time for the participants to study the accepted papers. The focal topic sessions could then begin with the papers being **taken as already read** (i.e. in lieu of actual presentation at the session) and be immediately thrown open for discussion. Questions could be asked of the authors and short contributions be given by non-listed participants provided they were pertinent and cleared beforehand with the chairman. While obviously placing a greater burden on the chairman or discussion leader, Gibbons hoped that this proposal would allow the sessions to be more lively and pertinent.

Three further detailed proposals came from J.J.H. Hastings. He suggested that:

1. Major congresses be divided so that sections meet simultaneously in two or more cities in the host country or in adjacent countries
2. A ceiling be placed on the numbers permitted to attend each section, to ensure that all the requirements of the delegates can be met
3. A small permanent international professional staff should be established, to assist each congress in the organization of business and services, financed by congress fees.¹¹¹

Following the close of the 1966 Moscow Congress, the International Association of Microbiological Societies entered another period of reconstruction. As before, Norman Gibbons would play a central role in the structural changes of the IAMS; with Gibbons taking the duties of treasurer, as well as those assigned to the Secretary General. Initially, the IAMS was successful in its bid to gain divisional status within the International Union of Biological Societies. The proposal passed at the 1968 Montreux IUBS Congress, and Gibbons tersely announced in a Newsletter “This makes no change in IAMS.”

Actually, there were minor modifications that accompanied the new status. The IAMS could now send two representatives to serve on the Executive Committee of the IUBS. Moreover, several committees and sections of the IAMS would become integrated into the IUBS structure. For example, the newly created Commission on Microbial Ecology became part of the Division on Environmental Biology. It is interesting to note that the IAMS opted to apply for divisional status within the IUBS, a new position would be in fact, short lived. Although the IAMS had in many ways far surpassed the efforts the IUBS, a separation from general biology was seen as unwarranted. In an unpublished history of the IUBS, Marise Hrousfein explains: “Although the Association is now much larger than many of the Unions recognized recently, it was felt that any attempt to divorce itself from the biological sciences would be a retroactive step.” The decision to set microbiology as its own union within the International Council of Scientific Union organization would wait for another decade.¹¹²

Planning for the Tenth International Congress for Microbiology in Mexico City began six years before its opening in August of 1970. As early as November of 1961, the Mexican National Society offered an informal invitation to host the congress. In 1964, an official invitation was received. When the Executive Committee initially considered of the choice between Mexico, Spain, Czechoslovakia, and Israel, the Mexican officials campaigned

¹¹¹ J.J.H. Hastings, London to Norman E. Gibbons, Ottawa, 12 January 1967.

¹¹² Marise Hrousfein, “The History of the International Union of Biological Societies,” 1980 (?), unpublished manuscript [Tms].

vigorously. Executive Committee member Stuart Mudd was sent to Mexico City to review the availability of adequate facilities. He was greeted by the past six presidents of the national society. Mudd was so impressed by the newly constructed buildings and the successes of other recent Mexican congresses, that he wrote letters to the remainder of the Executive Committee indicating that any other host city would be far inferior.

Although it broke with an earlier IAMS decision to alternate two congresses in the Old World for one in the New, the Executive Committee accepted the Mexican invitation (even before the General Assembly of the Moscow Congress could officially approve such a decision). A four year interval between congresses was preferred in order to guarantee that the Mexican government, which had so enthusiastically supported international scientific meetings, would still be in power.

The actual preparations for the Tenth Congress proceeded smoothly, with few noticeable exceptions. The dates of the Congress were moved twice. The Organizing Committee's initial choice was for late October, but many of the university-affiliated microbiologists would be unable to attend. The Executive Committee's suggestion was for early July. But this week conflicted with the World Soccer Championships in Mexico City, an event that would certainly overrun the available hotels and transportation systems.

The taxonomists once again found themselves in the midst of an administrative crisis. The president of the ICNB (and chairman of the Section on Culture Collections, Victor Skerman, sought to ensure that taxonomy would not be neglected, as was the (perceived) case at Moscow. As early as 1968, he was arranging the details of numerous symposia and round-table discussions for those interested in taxonomy. Skerman made it a point to remind both the Organizing Committee and the Executive Committee of "Minute (11) 25" of the Montréal Congress that made provision for "sponsoring sessions of a Section on Taxonomy and Classification at each International Congress." In an ICNB circular, Skerman triumphantly announced:

At this stage it can be stated that Taxonomy will, for the first time, take its rightful place in the Proceedings of the Congress itself. I have asked for one of the three Symposia on the Monday of the Congress week for the ICNB and on the Tuesday for the Section on Culture Collections. Provision will also be made for programs on Monday, Thursday and Friday afternoons – principally for Taxonomy.¹¹³

Although Skerman discussed his intentions with the Secretary-General of the Congress, L.F. Bojalil, and President of the Congress C. Casas-Campillo, most of his efforts were in vain. When the first circular for the Congress appeared, it listed a Section on Epidemiology **and** Taxonomy. Skerman wrote to Bojalil suggesting that epidemiology be transferred to the Section on Medical and Veterinary Microbiology so that taxonomy could be organized independently. Not only was Skerman's letter unacknowledged, the second circular omitted entirely a section on taxonomy. Skerman angrily wrote to Gibbons threatening that unless "something is done to ensure that the necessary arrangements are made for these, I will feel bound to discuss with the Executive Board of the ICNB the transfer of all these meetings to another centre with a

¹¹³ Victor B.D. Skerman, letter to chairmen and secretaries, subcommittees on Taxonomy, ICNB, p.2.

consequent boycott of the Congress.”¹¹⁴

Fortunately, Gibbons was able to mediate the approaching conflagration, as he already confronted the Organizing Committee about other scheduling conflicts. In May of 1970, his letters characterized his “annoyance” with many of the Organizing Committee's decisions. The section on Taxonomy was returned, this time on its own, and most of Skerman's proposals were included in the third circular. By his tenth year in office, the opinions of Norman Gibbons were not easily ignored and his requests were seldom met without any formal reply.

Between the Moscow and Mexico Congresses, the sections and committees of the IAMS were actively engaged. The Section on Culture Collections was reconstructed as the World Federation for Culture Collections. The blueprints for the WFCC were created at the 1968 Conference on Culture Collections held in Tokyo and the WFCC was partially financed by the Japanese Federation of Culture Collections. Its first task was the construction of a World Survey of Culture Collections (a cooperative project with the UNESCO/ICRO Panel for Microbiology). Based at the University of Queensland and under the Directorship of Victor Skerman, the WFCC also began preparation of an International Handbook of Procedures for Numerical Taxonomy and established a Fellowship and Training Course Program as an aid to microbiology in developing countries.

The Section on Economic and Applied Microbiology held its Second and Third Conferences on Global Impacts of Applied Microbiology (GIAM) in Addis Abbaba (1967) and Bombay (1969), and hosted symposia on such topics as fermentation and continuous cultivation. An International Organization for Bioengineering and Biotechnology (IOBB) was formed to foster collaborations of laboratories between developed and developing countries. The EAM goal of aiding developing nations was partially met by the program to “adopt” societies where newly created societies for microbiology were encouraged to seek “parent” or “sponsoring” societies in developed countries. For example, the Kenya Society for Microbiology affiliated with the Canadian microbiologists. The “parent” society was not obligated to provide financial support, but rather encouraged to provide administrative assistance and scientific direction to the new organizations. By 1970, EAM had already announced plans for eight more conferences and symposia through 1973.

In 1969, the Committee for Microbiological and Immunological Documentation finally published A World List of Periodicals Relevant to Microbiology and Immunology and began efforts to produce a second edition by 1973. J. Roger Porter remarked: “. . . unfortunately, most microbiologists seemed to think the committee was involved in “busy work” and that no documentation problems exist . . . My opinion is that the whole matter of scientific communication is more acute now than it was ten years ago.”¹¹⁵ The Permanent Section on Microbiological Standardization continued its frantic pace. Between 1967 and 1969, it held two congress and twelve symposia, each published as single volumes. The Permanent Section on Food Microbiology and Hygiene sponsored two large symposia (on botulism and the microbiology of dried foods) and its Committee on Microbiological Specifications for Foods published the handbook Micro-organisms in Foods: Their Significance and Methods of Enumeration, which quickly became the definitive guide to current work on testing methods.

¹¹⁴ Victor B.D. Skerman, Davis to Norman E. Gibbons, Ottawa, 1 May 1969, p.2.

¹¹⁵ J. Roger Porter, Iowa City, to Norman E. Gibbons, Ottawa, 27 September 1968.

A few new committees were added to the IAMS. Following the Second International Symposium on Yeasts, the Council of Yeasts and Yeast-like Microorganisms requested affiliation with IAMS. In December of 1968, the Executive Committee agreed that it would become the Commission on Yeasts and Yeast-like Microorganisms. Their Third International Symposium was held in the Netherlands in June 1969 and plans were laid for specialized symposia yearly. The integration of this new organization dramatically increased the membership of IAMS, as well as opened the door to a new field of research -- micromycology.

Unfortunately, IAMS officials grew disillusioned with the activities of the UNESCO/ICRO Microbiological Program. The more ambitious plans for international microbiology never materialized and the budget for 1971-1972 suffered substantial funding cuts. IAMS representative Porter lamented that national delegations to UNESCO repeatedly underestimated the importance of microbiology in such programs as Man and the Biosphere (MAB) and the Special Committee on Problems of the Environment (SCOPE). Porter called for a redoubled lobbying effort on the part of national societies for microbiology: “. . . in brief, if UNESCO is going to continue supporting microbiology a better plan than now exists must be worked out to retain or justify the funds.”¹¹⁶

The structure of the Tenth International Congress for Microbiology closely followed earlier congresses. Though there had been much talk of dramatic innovations, these changes would have to wait for another four years. The Organizing Committee enacted several small measures to mitigate the effects of an enormous international congress. The most significant is the inclusion of colloquia, which replaced many paper sessions. In order to allow for adequate discussion on the topics in question, many fewer speakers were invited. They were allowed only short presentations, and the remainder of the mornings left for open discussions. Additionally, the organizing committee exercised greater selectivity with regard to the paper sessions; a smaller number of papers were accepted and a higher percentage were read by title only.

There is some evidence that these measures were effective in improving the quality of the Congress. In a few other facets, the Organizing Committee was unable to avoid the pitfalls of the past. For example, the Committee found it difficult to limit the scope of the Congress. There were eleven sections (General Microbiology, Microbial Physiology, Genetics, Immunology, Medical Microbiology, Epidemiology, Industrial Microbiology, Agricultural Microbiology, Mycology, Virology, and Taxonomy) and over sixty symposia, colloquia, round tables, and seminars. Six-hundred and three papers were actually presented and there were twice as many pre-congress meetings than in Moscow.

Additionally, the Organizing Committee found it difficult to finance all of the social activities. For two of the night-time events, there was a substantial fee beyond the cost of registration. There was even some displeasure over the “black-tie” requirement for one particular dinner. Once Gibbons indicated that he refused to wear a tuxedo, the specification was relaxed.

The Congress opened August 9, 1970, in Mexico City at the National Medical Center in the Unidad de Congresos, a modern installation specifically designed for this type of convention. The scientific conduct of the Tenth Congress proceeded without major difficulties. Simultaneous translations were provided in Spanish, English and French. Also provided was

¹¹⁶ J. Roger Porter, Iowa City, to Norman E. Gibbons, Ottawa, 29 January 1970.

ample space for scientific and commercial exhibits. The symposia were well-attended, lively, and mostly ran on time. The sections on Microbial Evolution, Genetic Control of Microbial Metabolism, Enterobacteriaceae and Numerical Taxonomy attracted particular attention. Three general lectures were given by E. Kellenberger of the University of Geneva, C. Casas-Campillo of Escuela Nacional de Ciencias Biológicas and Salvador E. Luria. Luria's lecture was entitled "Molecular Biology, Past, Present and Future" and suggested that much of traditional microbiology was soon to be revolutionized by the newer fields of study.

However, the Tenth International Congress for Microbiology will be most remembered for the activities outside of its scientific sessions. At the Mexico Congress, the IAMS squarely confronted the problem of research for biological warfare. The issue of chemical and biological warfare (CBW) was not new to the IAMS in 1970. In fact, as early as 1947, at the Fourth International Congress for Microbiology in Copenhagen, the International Association of Microbiologists passed a resolution condemning the usage of CBW. The controversy, however, resurfaced in the mid-1960's and the Executive Committee tacitly agreed at the Moscow Congress to include a discussion for Mexico City.

Between congresses, the issue was being pushed from several sides. Vice-President of the IAMS and chairman of the Section on Economic and Applied Microbiology, Carl-Göran Hedén, held a particular concern for the horrors of chemical-biological warfare. Hedén's interests were aided by his affiliation with the Stockholm International Peace Research Institute (SIPRI), which had issued a comprehensive report on the current state of CBW research. The SIPRI report was followed by another study, sponsored by a UN commission and a resolution from the Pugwash Conference of 1968.

In 1969, United States President Richard Nixon issued a statement declaring that the United States unilaterally declined first-use of chemical-biological warfare, and that the U.S. government was considering the destruction of **old** stockpiles as well as the conversion of the Pine-Bluff and Fort Detrick CBW facilities to non-military purposes. Nixon's statements were somewhat misleading given that the administration allotted \$200 million annually for new CBW research and that the United States was still the only major nation not to ratify the 1925 Geneva Protocol outlawing chemical warfare.

Instead of diffusing the issue, Nixon's announcement galvanized world opinion against chemical-biological warfare. At the Third GIAM Conference in Bombay, a resolution was passed calling for the complete destruction of current stockpiles and establishment of international microbiological institutes at the military facilities. Hedén himself distributed an eight page document covering the effects of CBW and the responsibilities of microbiologists to halt such catastrophes.

Initially, the Organizing Committee for the Mexico Congress was not receptive to the idea of a CBW session. However, it quickly became apparent that such a discussion was unavoidable. Many national biological organizations held CBW conferences and the American Society for Microbiology passed a similar resolution with an added clause stressing the importance of free movement of scientists from one country to another.

By the Spring of 1970, the organization for the CBW conference had been set. At Hedén's suggestion, there were to be three meetings at the Mexico Congress. The first two were to be closed sessions, with only invited participants and national representatives present. Hedén originally lobbied for plenary meetings. After some reconsideration, he wrote to Bojalil

requesting closed sessions: “This proposal is based on an uneasy feeling that emotional and political considerations might creep into a Plenary more easily than into a closed session.”¹¹⁷

Nearly two-hundred pages of background materials were provided for each participant to study before the meetings. President of the IAMS, André Lwoff served as Chairman, and five panelists were invited to present their views on biological warfare before questions and discussion were entertained from the floor (O.V. Baroyan - USSR, J. Franek - Czechoslovakia, Hedén - Sweden, Riley D. Housewright - USA, and M. Kaplan - World Health Organization). The discussions were well-organized, and proceeded in a polite, scientific manner. Political accusations from the American, Soviet and Czechoslovakian members were sparse.

The two closed meetings produced the following resolution, which was ratified by General Assembly with only one abstention:

The microbiologists taking part in the conference on biological warfare at the Xth International Congress for Microbiology in Mexico, 7-14 August 1970, have studied and discussed in detail much material . . .

THEREFORE THEY ARE COGNIZANT of the great potential dangers of human, animal, and plant inventions to the welfare of mankind;

KNOW what grave consequences could result from the use of harmful microorganisms (bacteria, fungi and viruses) or their products as instruments of warfare;

DECLARE that microbiological methods of warfare should not be employed, even in retaliation;

BELIEVE also that no country should produce, sell or acquire microbial agents in quantity, except for peaceful purposes or to improve the health and well-being of Mankind;

CONVINCED also that: (i) the search for truth in science is enhanced by nonsecret research, and that secret research tends to increase mistrust and international tension; (ii) the results of scientific investigation should be published and widely disseminated, and (iii) the free movement of scientists from one laboratory or one country to another is an important aspect of science;

REALIZING that the pursuit of these aims is shared by the vast majority of Mankind as indicated by:

- a. the fact that a majority of UN member states have already signed and ratified The Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and Bacteriological Methods of Warfare, (Geneva, on June 17, 1925)
 - b. the scope of the United Nations General Assembly Resolutions 2162 (XXI) of 5 December 1966, and 2454 (XXIII) of 20 December 1968, which called for strict observance by all states of the principles and objectives of the Geneva Protocol;
 - c. the trend among nations to go beyond the provision of the Geneva Protocol for instance by unilaterally renunciation of use under any circumstances of biological weapons and of any further research and development of such weapons;
 - d. the fact that several nations have by treaty renounced the use of weapons of mass destruction;
 - e. the resolutions passed by many professional societies and congresses (appended)
- AFFIRM, SUPPORT AND WELCOME further positive activities of the same kind and

¹¹⁷ Carl-Göran Hedén, Stockholm to L.F. Bojalil, Mexico City, 12 December 1968.

particularly

WE URGE THAT:

- a. all countries that have not signed or ratified the Geneva Protocol should do so, and
- b. all installations (laboratories, academies, institutes, etc.) where established microbiological programs have been carried out expressly for offensive or defensive biological warfare purposes be converted to peaceful uses, if possible with international participation, and that no new installations should be commissioned.
- c. all stockpile of biological weapons should be destroyed as soon as possible.

The resolution was constructed by piecing together suggestions offered by the American Society for Microbiology, the French Society for Microbiology, the Finish Society of Biochemists and Microbiologists, the Biological Society in the German Democratic Republic, the Yugoslav Union of Biological Sciences, and the Federation of American Scientists. There was some justifiable concern among American biologists that the prohibition of any kind of research would set a dangerous precedent, as some observers argued that aspects of CBW research could reveal important aspects of human physiology and the nature viral infections. Furthermore, Housewright was able to convince many participants that strict enforcement of any CBW treaty was next to impossible.

The CBW conference also featured lengthy discussions over the future of international applied microbiology. Several detailed plans were offered for the conversion of U.S. military research facilities. For Hedén and others, the resolution was merely the first step in organizing international collaborative projects on a number of topics (*e.g.*, conservation of soils, crop productivity and biological nitrogen fixation, purification and recycling of sewage for drinking water, improved means of mass-vaccination). While none of these conversion plans were immediately realized, the IAMS resolution was an important symbol that its members were cognizant of the two-sided nature of their science. For international microbiologists, the simple discovery of new phenomena was not enough, they repeatedly sought the proper applications of their scientific endeavors.

The Tenth International Congress for Microbiology is also best remembered for its dramatic reorganization of the IAMS. As an attempt to deal with the ever-increasing size of its congresses and scope of its activities, the Executive Committee of the IAMS reevaluated its structure and functions in 1968. One year later, Norman Gibbons circulated a letter outlining his vision of a new IAMS. These ideas were discussed at the Executive Committee meeting in May 1970 in Paris, and were approved with little revision.

The major proposals were four-fold. Firstly, membership would be open to any microbiological society. This was intended to allow smaller societies to be represented and to dilute the nationalistic aspects of IAMS voting. In many countries there would be no change; in others several societies could now be eligible for membership. For the purposes of the Association, microbiology was defined as the study of bacteria, viruses, yeasts and microfungi. To be eligible a microbiological society must have at least twenty members and hold at least one open scientific meeting annually. Societies in a country could still organize as a national committee or organization, as was the case for Britain's Society for General Microbiology.

Secondly, the main division for the IAMS would be by disciplinary sections: Bacteriology, Virology, and Mycology. There was some talk of dividing the IAMS along

operational lines, but Gibbons and others contended: “To avoid microbiology becoming lost in Unions of Biochemistry, Genetics, etc., the organization shall be by disciplines based on bacteria, viruses and microfungi.” Gibbons originally envisioned a fourth Section for Economic and Applied Microbiology, however he conceded that this area was best suited to an intersectional committee.

Bacteriology had traditionally been the focus of the IAMS, and while virology had been well-covered by past congresses, a separate First Congress of Virology was held in Helsinki in 1968 with five-hundred and thirty-six virologists attending from thirty-seven countries. The Congress passed a resolution requesting that a separate section of virology be established within the IAMS. The proposed mycology section raised several other issues. While previous microbiological congresses had included some mycological topics, the IAMS had no direct contact with mycological groups. The reason for this separation was that mycology had been traditionally linked with the Botany Division of IUBS. However, in 1969, the Executive Committee of IUBS indicated that it had no objection to IAMS considering microfungi in its official structure. Gibbons suggested that a representative be sent to the First International Congress for Mycology in Exeter in 1971 to offer an official invitation to those interested in microfungi to form a Mycology Section.

Thirdly, the present sections and committees would be restructured and renamed, forming the organization of COMCOFs (for Committees, Commissions and Federations). Definitionally, a committee is composed of one representative of each member society interested in the work of that committee; a federation is composed of organizations, laboratories or units interested in a common objective; and a commission is composed of individuals interested in a common objective, with no requirement that each member nation be represented. In order to avoid confusion the name of the Executive Committee of the IAMS would be change to the “Executive Board.” The COMCOFs could organize their own symposia and conferences, and could deal with more than one of the disciplinary sections.

Fourthly, the unit fee would be based on membership of individual societies. Gibbons hoped that this proposal would significantly increase the revenues of the IAMS treasury (then set at \$4,000 annually). If membership was not limited to one society per nation, the number of paying societies would surely increase. Moreover, Gibbons recognized that the IAMS represented well over 60,000 microbiologists. If fees were determined based on society membership, even at one dollar per member, the IAMS would have sufficient funds to pay for a permanent secretariat and to conduct most of its organizational duties. Gibbons made several pleas for an increase in revenues. He explained “If it is to provide leadership in international science and more detailed involvement in the planning of microbiological meetings, it will require permanent staffing and adequate funds. Probably the fairest way of obtaining funds would be with a fee structure based on individual membership, regardless of multiple membership.”¹¹⁸ Gibbons also solicited support for an International Committee on Microbial Ecology, to coordinate efforts with other international environmental organizations, and for an International Committee on Microbial Genetics.

The proposed changes in the IAMS were passed by the General Assembly at Mexico City without major revisions. The necessary modifications to the statutes were made and published

¹¹⁸ Norman E. Gibbons, Ottawa, to delegates to general assembly, 25 May 1970.

separately before the end of the year. It was decided that each of the three sections would alternately hold a Congress, at three year intervals, with the fourth year dedicated to an intersectional congress. Thus, a Congress for Virology was scheduled for Budapest, June 27-July 3, 1971, and plans were in progress for a Congress for Bacteriology in Jerusalem in 1973.

Two of the sections were able to establish organizational structures at the meetings of the Mexico Congress. The Section of Bacteriology represented twenty-two countries and elected the Jacques C. Senez (France) as its chairman and Rita R. Colwell as its secretary (USA). Representing twenty-four countries, the Section of Virology chose Joseph L. Melnick (USA) as its chairman and Nils Oker-Blom as secretary. While twenty-three mycologists from thirteen countries attended the mycology organizational meeting, they were only able to elect a temporary chairman, Everette S. Beneke (USA).

The mycologists chose to postpone further action until the Exeter Congress. Unfortunately, this decision only complicated matters. The representatives at Exeter voted to affiliate with the Division of Botany of the IUBS. However, Gibbons and Beneke were able to convince the International Society for Human and Animal Mycologists to join the International Commission on Yeasts and Yeast-like Microorganisms in forming a Mycology Section. It was agreed that the section could retain affiliation with other organizations, and it was understood that issues of taxonomy would not be included in its duties. The setbacks to reorganization were also seen in the action of immunologists. A separate congress of immunology had been held in 1968, and rather than seek affiliation with the IAMS, the immunologists had formed an international association of their own.

Additionally, there had been some question raised concerning other possible sections. A section on protozoology was proposed but received little support. Gibbons indicated that the International Society of Protozoology had elected to join the Division of Zoology of IUBS, but that he would discuss a link with microbiology at the IUBS General Assembly in October.

The reorganization of committees, however, occurred without much difficulty. Some committees changed their names (*e.g.*, the ICNB became the International Committee on Systematic Bacteriology) while others became commissions (*e.g.*, the International Commission on Microbiological Specifications for Foods, the International Commission on Microbiological Standardization). These changes were published in the 3rd edition of the Working Committees booklet. The second edition was available in January of 1968, and Gibbons made sure that each member nation received a copy.

The real quandaries arose with regards to the proposed fee structure of the IAMS. Although the majority of voting members approved a membership-based plan, several objections were voiced. For example, many countries had currency export restrictions. Other nations had several societies that included multiple memberships, so that the same microbiologist was represented by more than one organization. T. Sacs from Israel proposed the formula be based not on members but on annual income. Rather than confront the issue squarely, the General Assembly voted to name a committee of nine members to study the problem and make recommendations at a later time.

The Tenth International Congress for Microbiology opened and closed with speeches from its past and new presidents. Speaking in French, André Lwoff paid tribute to Robert Buchanan, who had attended every International Congress for Microbiology, and had served as president of the ICNB's judiciary commission from 1939 to 1966. Lwoff also devoted several

paragraphs to justifying continued attention among microbiologists to issue of chemical-biological warfare. In his closing address, Victor M. Zhdanov noted the end of an era:

. . . the Mexico Congress becomes the last giant congress of the whole Association, a rubicon, after which our association goes out into a vast space for its further development. Of course, it is a little bit sad to recognize, that this Congress is the last one in the sense of our old traditions.

The Mexico Congress did herald the beginning of a period of activity. With 46 member nations, and a new Executive Council (Zhdanov, Gibbons, President-Elect A. Ashley Miles, and the three sectional chairmen) the International Association of Microbiological Societies began the difficult process of coordinating many more sections, Committees, Commissions and Federations (COMCOFs), congresses, and symposia.

CHAPTER 6 DECENTRALIZATION AND DIVERSIFICATION, 1971-1991

During the 1970's, the newly designated Committees, Commissions and Federations (COMCOFs) assumed a more active role in the IAMS. Consequently, the Executive Board became more a center of coordination, rather than of control. However, as the operations of the IAMS became decentralized, the duties of the General Secretary were not reduced. Although he retired from his university and National Research Council positions shortly after the Mexico conference, Norman Gibbons continued his IAMS activities. His efforts were even more heroic given the special circumstances under which Gibbons worked. Owing to the passing of Robert Buchanan, Gibbons assumed the enormous task of compiling and editing the 8th edition of the Bergey's Manual of Determinative Bacteriology. Not only did he lack an administrative staff (since he worked out of his home), Gibbons continue duties as Secretary-General despite a life threatening heart condition.

The years immediately following the Mexico Congress were devoted to finishing the details of reorganization. A questionnaire was circulated in order to determine the size and scope of the member societies.¹¹⁹ Additionally, since membership was no longer limited to one society per nation, Gibbons extended an invitation to previously excluded associations. However, responses were few and far between.

Nonetheless, the sections of the IAMS were immediately active. The Second Congress for Virology was held in Budapest, in the Summer of 1971 with 984 registrants from 45 countries, and the Third International Congress was set for September 1975 in Madrid. With the substantial progress made in the investigation of structural and biochemical properties of viruses, the International Committee on the Nomenclature of Viruses (ICNV)¹²⁰ had much to discuss (although still found itself without substantial agreement). The Section on Bacteriology held its First Congress in Jerusalem in 1973. With one thousand and eighty registrants from thirty five countries, the Bacteriology Congress was considered "a great success scientifically, socially and financially."¹²¹ This assessment is even more unusual given the tense political climate in the Middle East during the fall of that year.

After its 1971 congress in Exeter, the Mycology Section was formed, with the International Society for Human & Animal Mycology (ISHAM) and the Commission on Yeasts & Yeast-like Microorganisms comprising its core. Official liaisons were also established with the International Society for Plant Pathology (ISPP) and the International Group on Plant

¹¹⁹ Gibbons had hope to use the questionnaires to determine membership fees for each society. Although many replies were not forthcoming, fees were set at a minimum of \$100 (U.S. dollars) per society. For each additional member over 350 for a given society, an additional 30 cents was levied.

¹²⁰ The ICNV changed its name in 1974 to the International Committee on the Taxonomy of Viruses (ICTV).

¹²¹ The congress was one of the few held under budget, and the section was able to present a "token" contribution to the IAMS treasury. Norman Gibbons, "Report of the Secretary General: 1970-1974," Proceedings: First Intersectional Congress, 9.

Pathogenic Bacteria. Although the statutes of the IAMS specified a rotation among its sections, congresses for mycology and virology were both set for 1975. The rotation stipulation was quickly revised. It became apparent that governments were reluctant to underwrite travel expenses to both sectional and intersectional congresses, especially for proximate years. Therefore, it was decided at the Bacteriological Congress in Jerusalem to hold the Sectional gatherings immediately prior to, or following, the Intersectional Congress in neighboring cities or countries.

As expected, the COMCOFs had been actively engaged. In 1972, the International Commission on Microbial Ecology (ICOME) held its first symposia in Uppsala (on "Modern Methods for the Study of Microbial Ecology") and established affiliations with a host of UNESCO programs, including SCOPE (Special Committee on Problems in the Environment), MAB (Man and the Biosphere), the U.N. Environment Program (UNEP), and the IBP (the International Biological Program). The interests of the International Commission on Microbiological Standardization expanded beyond microbial products and in 1971 consequently changed its name to the International Association of Biological Standardization (IABS). In intervening years between the Mexico and Tokyo Congresses, the IABS, the Commission on Microbiological Standardization, the Commission on Yeast and Yeast-like Microorganisms, the World Federation of Culture Collections, and the Committee on Economic and Applied Microbiology all held symposia or international conferences.

Between 1970 and 1974, the International Committee on Systematic Bacteriology faced the difficult challenge of rewriting the Code of Nomenclature of Bacteria. A core of experts that included Stephen Lapage, Peter Sneath, William Clark, E. Lessel and Heinz Seeliger were responsible for most of the revisions. The importance of the Code should not be understated. For three decades, it had served as the definitive guide to the bewildering field of bacterial taxonomy. Unfortunately, the state of knowledge had changed so dramatically since the first two editions that the code was woefully out of date.

The number of IAMS publications increased. While the newsletter was temporarily put to rest, the IAMS assumed responsibility for issuing the International Journal of Systematic Bacteriology and began publishing Intervirology. Continuing the historic mission the IAMS, intervirology was dedicated to bridging the various fields of virology and bacteriology. The journal was so named:

. . . not only to indicate its international aspects but also to emphasize its policy of accepting papers in all branches of the science. . . The subject areas are: Structure of Viruses; Plant Virology; Invertebrate Virology; Bacteriophage; Virus-Cell Relationship; Replication of Animal Viruses; Genetics; Epidemiology; Oncology; Immunology; Taxonomy.¹²²

Under the editorship of Vic Skerman and S.M. Martin, the World Federation of Culture Collections published its monumental World Directory of Culture Collections of Microorganisms in six languages and the International Association of Biological Standardization began publishing the Journal of Biological Standardization in 1973.

Although preparations for the Tokyo Intersectional Congress began in 1971, the

¹²² Annual Report of the Virology Section, International Association of Microbiological Societies: Proceedings, First Intersectional Congress, Tokyo, Sept. 1-7, 1974, (unpublished), 29.

Organizing Committee had little precedence to guide them. Since congresses for virology and bacteriology were scheduled for intervening years, there were questions concerning the scientific content of the intersectional meeting. However, the open-ended nature of this Tokyo Congress proved to be something of a benefit. The program committee was under no obligation to include all aspects of microbiology. Moreover, they could exercise greater control over invited speakers.

The structure of the First Intersectional Congress at Tokyo differed in many respects from the former International Congresses for Microbiology.¹²³ The Organizing Committee greatly restricted the number of topic sections and accepted papers. Since separate congresses for virology and bacteriology were held recently, Daizo Ushiba (Secretary General of the Congress) and the Program Committee focused on issues that might be of general interest. Only eight sections were listed on the second circular, which were in turn divided into a number subsections: Comparative Microbiology, Developmental Microbiology, Infection and Anti-Microbial Agents, Immunity and Non-Specific Resistance, Microbial Toxins, Microbial Products, Ecology and Preservation. Consequently, only four hundred and ninety papers were received for presentation, and slightly less than half accepted. Among the specific topics discussed were: mycotoxicoses; mechanism of action of antibiotics; fungal vectors of soil borne plant viruses; novel microbial products; actinomycetes as boundary microorganisms; interferon and interferon inducers; initial steps of infection with plant viruses; and flagella.

The First Intersectional Congress of the IAMS opened on September 2, 1974, with over fifteen hundred registrants representing thirty-nine nations in attendance. Dr. Zyun Hidaka, chairman of the Organizing Committee, and Dr. Yuichi Ochi, president of the Science Council of Japan, delivered welcoming addresses. It is interesting to note that Koichi Yama, president of the Agricultural Chemical Society of Japan, considered the Intersectional Congress to be "instrumental in the future development of our organization," since the cooperation necessitated by the duties of the Organizing Committee might generate enough support for a federation of many microbiological societies in Japan (*e.g.*, the Japanese Society of Veterinary Science, the Society of Fermentation Technology, and the Phytopathological Society of Japan, the Japanese Society for Bacteriology, The Society of Japanese Virologists, the Japanese Society for Medical Mycology, etc.).¹²⁴

During the week long congress, one-hundred and sixty nine papers were presented in forty-five scientific sections. General lectures were presented by Carl-Göran Hedén of the Karolinska Institute of Sweden and Hamao Umezawa of the Institute of Microbial Chemistry of Japan. Hedén spoke on the importance of developing rapid and simple bacterial identification procedures for the fermentation industry,¹²⁵ while Umezawa delivered an comprehensive paper

¹²³ When the Congress opened, Gibbons commented to one Japanese newspaper, "Microbiologists are natural experimenters, as they have shown by modifying the statutes of the IAMS at eight of their 10 international congresses. The Tokyo meeting is an experiment." Asahi Evening News (3 September 1974).

¹²⁴ Koichi Yama, ISC-IAMS Daily News (3 September 1974): 2.

¹²⁵ "In this context, automated cultivation techniques constitutes an important link between numerical taxonomy and those modern pattern recognition techniques which can be used on biochemical, serological and other types of microbial 'finger-prints'." Carl-Göran Hedén, "Summaries of Featured Lectures," Asahi Evening News (3 September 1974).

on the use of anti-tumor antibiotics (bleomycin) in cancer therapy. Heated discussions were also found in the sessions on interferon, the taxonomy of actinomycetes, and the training of research microbiologists. Under the direction of its new chairman, Gyoza Terui, the International Committee on Economic and Applied Microbiology conducted a lively symposium on "Microbial Growth on C1 Compounds."

Unfortunately, many of the COMCOFs did not hold scientific or business meetings at Tokyo. Most noticeably absent were assemblies of the WFCC, the International Federation of Enteric Phage Typing, the International Committee on the Nomenclature of Viruses and some of the subcommittees of the International Committee on Systematic Bacteriology. With the Jerusalem Sectional Congress less than a year behind them, most chairmen believed that another series of meetings was unnecessary. There was also considerable doubt as to the number of taxonomists who could afford international travel in consecutive years.

Although the scientific program of the Tokyo Intersectional Congress did not compare to the previous international congresses, its importance is found in the implementation of sundry administrative changes initiated at the Mexico Congress. The statutes were again revised, this time specifying the composition, functions and relationships of the COMCOFs.

The general assemblies pondered the creation of two new bodies, a Committee on Microbial Genetics and a Federation of Microbiological Institutes. The former was an outgrowth of the concerns surrounding recombinant DNA technology. A moratorium on certain DNA transformations was proposed by the Symposium on the Genetics of Industrial Microorganisms, and many believed that it was best to have microbiologists involved in any such policy decisions. As an example of such policy considerations, the plenary session adopted the following resolution with regard to the patenting of microorganisms:

It is recommended that in countries allowing the patenting of microorganisms or of processes in which microorganisms are involved, provision should be made for the deposition of these organisms in recognized culture collections to ensure that the organism is available for official examination by control authorities for authenticity.¹²⁶

The notion of a Federation of Microbiological Institutes emerged from Directors of Microbiological Institutes meeting in Paris, commemorating the one hundred and fiftieth anniversary of Pasteur's birth. Many of the group believed that "owing to the great progress and sophistication of the various branches of microbiology, and the increasing importance of the applications of the microbiological sciences, no single institute can encompass the whole microbiological experience."¹²⁷ Consequently, greater cooperation among the institutes was called for in order to (again) bridge the widening gulf among microbiologists. The topic resurfaced at a Tokyo meeting prior to the Intersectional Congress. Working in close collaboration with the IAMS, the proposed Federation (initially composed of the Pasteur Institutes, the Gamaleya Institute, the Kitasato Institute, the Montreal Institute of Microbiology

¹²⁶ Interest in this issue was shared by the World Intellectual Property Organization. Proceedings: First Intersectional Congress, 4.

¹²⁷ "Report on Federation of Microbiological Institutes," Appendix B, Proceedings: First Intersectional Congress, 24.

and Hygiene, and the State Institute of Hygiene in Warsaw) would be directed to promote the exchange of information and scientific personnel among institutes, as well as sponsor training courses for institutes in developing countries.

As the Tokyo Congress drew to a close, Munich was officially selected for the next Intersectional gathering and an Executive Board chosen, with Heinz Seeliger as President-elect. For the first time in twelve years, there was a new Secretary-General, Jacques Senez, and an Assistant Secretary, Fabian Fernades. The choice of Jacques C. Senez as the new Secretary General proved to be opportunistic. In addition to serving as president of the Microbiological Society of France and the chairman of the IAMS Section of Bacteriology, Senez was active in the international scientific community. He had been particularly concerned with biological solutions to the world population and food crises, and was a key figure in organization of the World Population Conferences and the U.N. Protein Advisory Group. The sectional chairmen (Daizo Ushiba -- bacteriology; Everett Beneke -- mycology; and Peter Wildy -- virology) completed the Executive Board membership.

Assuming his position as acting President, Sir Ashley Miles envisioned the new role of the Intersectional Congresses, one that did not drastically differ from the objectives of the First International Congress for Microbiology in 1930 (Paris). While observing that the Tokyo meeting was an "experiment in reorganization," he found great value for these intersectional gatherings in discussing topics that transcended the boundaries of the organism-based fields (*e.g.*, mycology, bacteriology, virology):

The gathering of representatives of all the microbiological disciplines for the formal business of the IAMS might well have led, scientifically, to a multidisciplinary display of special aspects of the different kinds of microbiology. The organizers of the congress have ensured that our meetings are really inter- not merely multi- disciplinary in intention. . . ¹²⁸

Miles suggested that all microbiologist held interests in genetics, the architecture and enzymic activities of cells and virons, the nature of immunity, or the ramifications of applied and environmental microbiology. The President's words echoed the sentiments of the founders of the first International Society for Microbiology, who sought to promote a cross-fertilization of ideas among the fields and specialties of microbiology, and similar statements were expressed by Zyum Hidaka, Chairman of the Organizing Committee: "It is indispensable -- and in fact necessary -- that microbiology should develop in the form of divisioned expert disciplines, but it is equally important for these realms of microbiology to work interdisciplinarily for further scientific development."¹²⁹ The profitability of such interfield connections had already become evident from the First Intersectional Congress, where cooperation among medical, veterinary, agricultural and chemical researchers "had greatly contributed to the clarification of the structure and activity relationship of mycotoxins."¹³⁰

Norman Gibbons also offered a few parting thoughts about the future of the IAMS. He too called for the further creation of interfield connections among bacteriologists, virologists and

¹²⁸ Sir A. Ashley Miles, Presidential Address, quoted in "Tokyo Session Seen a Prelude to Change," Asahi Evening News (3 September 1974).

¹²⁹ Asahi Evening News (3 September 1974).

¹³⁰ "Twelve Themes Remaining on Agenda," ISC-IAMS Daily News (6 February 1974): 1-2.

mycologists in order to guard against the "fragmentation of IAMS." But Gibbons was well aware that such ties could not be maintained if the COMCOFs and member societies did not communicate with the Secretary-General. Moreover, Gibbons warned that the Intersectional Congresses would be without value if they did not include business and scientific meetings of all the COMCOFs.¹³¹

An issue left unresolved by the Tokyo conference involved the status of the International Association of Microbiological Societies vis-a-vis the International Council of Scientific Unions. In 1972, J. Roger Porter and other representatives of the American Society of Microbiology proposed that the IAMS seek union status within ICSU. They contended that IAMS was already significantly larger than many other accepted Unions (*e.g.*, International Union for the Conservation of Nature) and that the importance of microbiology as a distinct discipline warranted its separation from the IUBS. In Porter's words: ICSU decides significant scientific policy matters in world science. Science is now moving into a "biological era" and there is, therefore, a need to get microbiologists involved at the top level of policy-making. It is extremely important that microbiology views be presented and heard at this level.¹³²

Furthermore, there was a financial incentive to seek union status. Membership dues for unions of ICSU are paid directly by governments, instead of national member societies. The IAMS had struggled financially when several societies neglected their dues. The prospect of union status carried hope of increased and stable budgets.

However, the ASM proposal was not initially well-received. ICSU officials were most discouraging. In fact, a clause in the ICSU statutes stipulated that new unions shall only be admitted to membership "when there are strong scientific reasons for their admission, and where there is no possibility of an ICSU member Union to accommodate the new discipline by modification of its structure." As an example of the trials that lay ahead, a few dissenters noted that the union for pharmacology was recognized only after twelve years of effort. Microbiologists had a difficult time arguing that the IUBS neglected their needs. In fact, IAMS comprised a significant portion of the IUBS. Although there were five divisions of the IUBS (microbiology, botany, zoology, ecology, and structure and function) only two, microbiology and botany were truly active. Decoupling microbiology from the IUBS would have seriously undercut the position of the latter. The Vice-President, and two executive board members of the IUBS were microbiologists. Norman Gibbons had even begun efforts to coax the IUBS secretariat into providing administrative support for IAMS activities.

There were other substantial barriers to seeking union status. A costly permanent secretariat and headquarters would likely be required (the IUBS devoted \$36,750 in 1972 to the secretariat's office). Additionally, since many governments already contributed substantial fees to the many ICSU unions, a new union might not receive full government subventions for some time. The general sessions at the Tokyo Congress failed to produce a consensus opinion, and Gibbons and Senez remained (for the moment) hesitant. Instead, an *ad hoc* committee was

¹³¹ Norman E. Gibbons, "Varied Vital Issues Now Await Solution," Asahi Evening News (3 September 1974).

¹³² Reported in Appendix C, "Section of Bacteriology," Proceedings: First Intersectional Congress, 15.

formed, under the chairmanship of Philipp Gerhardt, to study the issues and report to the Executive Board at the Munich Congress.

After two years of intermittent deliberations, the *ad hoc* committee forged explicit plans for union status. In August of 1977, a proposal for the establishment of an International Union of Microbiological Societies circulated among national committees and member-societies. The statement was signed by the members of the Executive Board and the chairman of the ad hoc committee. Although the proposal listed both pro and con arguments for union status, it was careful to point out that the IAMS could become an independent union and still retain its current organization and financing. National committees and member-societies were requested to reach a decision on the issue and to inquire about the position of their national ICSU adhering organization concerning the admission of a new union of microbiology.

Within a year, a majority of IAMS members responded favorably to the union proposal. In June of 1977, Senez officially informed the President of IUBS, Nils Oker-Blom, that the IAMS would seek independent union status. As expected, the IUBS openly resisted the *fait de complete*. The Executive Board of IUBS unanimously adopted the following resolution: The Executive Committee of IUBS, noting the intention of its Division of Microbiology to separate from the Union and realizing that the IAMS has already committed itself to asking its Members to take a decision on the application for Union Status in ICSU, unanimously:

- regrets the action,
- regards it as an unfortunate decision considering the unity of biology and particularly the acute and urgent needs of joint and coordinated activities in solving some of the most important biological problems of humankind,
- requests the Division to reconsider the action.¹³³

In order to keep microbiologists within the fold, IUBS included a greater number of IAMS members on its Executive Committee. At the 19th General Assembly of IUBS, in Bangalore, September 1976, Oker-Blom, past secretary of Virology Section was elected president of the union. Jacques Senez was elected member for Microbiology of the Executive Committee and Daizo Ushiba, chairman of the Bacteriology Section, was chosen as an alternate. For the IAMS, support of the IUBS was considered essential to achieving union status, as ICSU approval required support from twelve member scientific unions. Although the steps toward an International Union of Microbiological Societies had already begun, another five years would be required to complete the process.

In 1975, the Sections of Virology and Mycology held congresses. The Third International Congress of Virology was a particularly impressive gathering. Held in Madrid at the "Palacio de Congresos," eleven hundred registrants from fifty-one countries were in attendance. Over six hundred papers were presented in symposia and "workshops," focusing primarily on the molecular aspects of animal virology. (There were very few papers on phages or plant viruses.) One theoretical paper session drew vigorous participation. A group of American researchers addressed "questions of where, when, and how viruses have evolved in nature, covering the viroids as well as viruses of bacteria, plants and animals."¹³⁴ A heated

¹³³ Resolution reprinted in "Reports of the Secretary-General and Treasurer," *IAMS Newsletter* 3 (August 1979): 11.

¹³⁴ "Third International Congress for Virology," *ASM News* 42 (1976): 21.

debate ensued over the available methods for determining phylogenetic histories of viruses. Although no resolution of the issues was evident, the workshop provided a forum for virologists to discuss the evolution of viruses. A few observers noted "despite the lack of virus fossils, current methodology can elevate this field from the area of pure speculation into an active area of research."¹³⁵

If the Tokyo Congress was considered an experiment, the Munich organizing committee (chairman Wilhem Wundt, and secretary K.H. Schleifer) made little effort to replicate its results. From the early stages of planning, the 1978 Munich Congress diverged greatly from its immediate predecessor. The Sections of Bacteriology and Mycology comprised the vast portion of the scientific program. (Prior to the Intersectional Congress, the Fourth Congress of Virology was held at the Hague.) Split between two locations in Munich, the Bacteriology Section organized twenty-six symposia, with nineteen planned for Mycology.

While the Munich Congress represented further isolation among the fields of microbiology, there was still an effort to bridge specialties within the sections. For example, Mycology Section chairman Everett S. Beneke remarked, "Even the most widely differing kinds of mycologists will have certain common interests in the symposia selected such as: genetics, dimorphism, ultrastructure and function, enzymes and metabolism, fungal viruses, and ecology." Where open discussion of topics was seen as more desirable, the program committee included fourteen round-table sessions on such topics as "Evaluation of Recent Publication on the Systematics of Bacteria," "Education in Microbiology and "Interdisciplinary Mycology: Some Trends in Basic and Applied Mycology."

Three general lectures, spread over five days, represented the totality of the "intersectional meeting." R. Y. Stanier of the Pasteur Institute lectured on the "Possible Evolution Filiations between Prokaryotes and Eucaryotes," J.R. Postgate surveyed the "Biochemistry and Genetics of Nitrogen Fixation," and G.N. Cohen dedicated to Jacques Monod a paper entitled the "Functionally and Structurally Discrete Domains in Globular Proteins." With these interdisciplinary events aside (and allotting for COMCOF and IAMS business meetings) the Munich assembly resembled simultaneous Congresses of Bacteriology and Mycology, rather than an Intersectional Congress.

The Munich Congress contained a few other novel additions. Papers were presented by invitation only and the Twelfth International Congress for Microbiology (Second Intersectional Congress) was the first to include poster sessions in lieu of open presentation of papers.¹³⁶ The Munich sessions also introduced a taxonomic problem of their own. Although the Tokyo meeting was considered the First Intersectional Congress, the 1978 gatherings would technically be designated the Second International Congress for Bacteriology, the Fourth International Congress for Virology and the First International Congress for Microbiology. In order to reduce some of the confusion, the Executive Board chose to return to the old nomenclature by referring to the Twelfth International Congress for Microbiology. Thus, in retrospective, the Tokyo

¹³⁵ Ibid, 22.

¹³⁶ The Third International Congress of Virology was actually the first to introduce the poster session to the IAMS. However, a summary report of the Madrid Congress noted, "attendance at the poster sessions were poor and the very small technical exhibits were virtually ignored." H.R. Whitley and J.M. Joseph, "Report to the CPC on the 3rd International Congress of Virology," 30 November 1975.

gathering represents the Eleventh International Congress for Microbiology. As with most classifications in microbiology, the scheme would be revised within a few short years.

In Winter of 1978, the World Academy of Arts and Sciences established a "Stuart Mudd Award." In light of the late Dr. Mudd's involvement with the IAMS, the World Academy choose to present the award to its first recipient, J. Roger Porter, at the Intersectional meetings. The official statement released by the World Academy noted that award was given in recognition of: . . . his (Porter's) outstanding contributions to microbiology and for his wisdom and humanitarian thinking in furthering the applications of this science. Professor Porter has promoted an understanding of the social relevance of the interrelations between bacteriology, immunology and virology, a recurrent theme in Dr. Mudd's thinking.¹³⁷

A number of administrative decisions emerged from the intersectional meetings. The general assembly voted unanimously in favor of union status. Senez announced that several new member societies had been admitted, raising membership of the Association to sixty-one microbiological societies in fifty countries, with a reported number of fifty-five thousand individual scientists.

The members of the Mycology Section tried to sooth disturbed members of the International Mycology Association. As a separate organization, IMA executive officers objected to the IAMS designated "International Congress for Mycology" as the IMA had held three previous international meetings with similar titles. Senez rationalized that "difficulties lie in the definition of 'mycology' and there are no classifications available to the protozoologist, parasitologist, plant pathologist or industrial (non-medical) mycologists."¹³⁸ Outgoing mycology chairman Beneke promised to work toward greater cooperation among IAMS, ISHAM, and IAM.

At its council meetings, the Virology Section unanimously voted to hold its own congresses, every three years, separate from other IAMS sections, and scheduled its next congress for 1981 in Strasbourg, France. The "secession" of the section from the IAMS congress brought a chorus of protests from the floor. However, sectional chairman Peter Wildy explained that the action was due to the rapid growth in the field and the assured success of smaller meetings. In a conciliatory move, the Executive Committee asked the Virology Section to "contribute" to the 1982 IAMS Congress on certain subjects.

Among the three invitations for the Thirteenth International Congress offered, the Executive Board recommended Boston for August of 1982 and new members for the Executive Board were chosen:

President	-	Heinz P.R. Seeliger (FGR)
President-Elect	-	J. Roger Porter (USA)
Member-at-Large	-	Włodzimierz Kuryłowicz (Poland)
Member-at-Large and Treasurer	-	Stuart Glover (UK)
Bacteriology Chairman	-	Sam Faine (Australia)

¹³⁷ "The First Stuart Mudd Award Presented in Munich," *Campus Scope* (October 1978): 30.

¹³⁸ Jacques C. Senez, "Minutes of the Executive Board of the IAMS: 7 September 1978, Munich," *IAMS Newsletter* no. 3 (August 1979): 24.

Mycology Chairman - Kazuo Iwata (Japan)
Virology Chairman - J.P.H. van der Want (Netherlands)

Jacques Senez would again serve as Secretary-General and, in order to provide a more prolific publication of newsletters and bulletins, Timothy Myoda was made editorial assistant. The composition of the Executive Board, however, was soon tragically altered. Newly chosen President-elect Porter, diagnosed with liver cancer, passed away in May of 1979 and Philipp Gerhardt was designated as acting successor.

The representatives from the American Society for Microbiology quickly found that plans for the 1982 Boston Congress were in jeopardy. Not only did the Virology Section fulfill its promise to hold a separate congress in 1981, the International Society of Human and Animal Mycology (a commission of IAMS comprising half of the Mycology Section) decided to hold its congress in 1982 in New Zealand, rather than Boston. Furthermore, ISHAM agreed to affiliate with the International Association of Mycologists, a move clearly contrary to IAMS efforts to integrate the field of mycology within the broader discipline of microbiology. ASM president Willis A. Wood warned that the Boston invitation was based on the participation of all sections:

Financial arrangements are an important aspect of a successful congress and unlike other countries, no governmental subsidy is expected in the U.S. Therefore, success of the congress depends upon a broad program and a strong general and integrated program to attract participants and funding. Some ASM officials are critical of the Boston Congress and doubt the wisdom of holding the Congress under the current circumstances.¹³⁹

Fortunately, arrangements for the Thirteenth International Congress (Third Intersectional Congress) proceeded without delay. Some observers noted that if union status was achieved, independent actions of the sections, (elevated to the status of divisions) would be justified.

From 1979 to 1981, the *ad hoc* Committee on Union Status made significant progress. American and French delegations presented and promoted motions to the General Assembly of the International Union of Biological Societies, at Helsinki in 1979, declaring that IUBS should vote favorably on the IAMS application. The proposed resolution contained the following conciliatory statement: "IAMS recognizes that continued mutual goodwill, cooperation and coordination with IUBS would be necessary and desirable, and wishes to further such aims by mutually acceptable mechanisms after its evolution into IUMS."¹⁴⁰

Surprisingly, the IUBS reversed its earlier opposition. By the summer of 1980, official supporting statements for the conversion of the IAMS into the International Union of Microbiological Societies had been received by six scientific unions and twenty-four national members of ICSU, including unions of biological sciences (IUBS), biochemistry (IUB), nutritional sciences (IUNS), pure and applied biophysics (IUPAB), pharmacology (IUPHAR), and immunological societies (IUIS). It is important to note that among the eighteen unions affiliated with ICSU, not one was recognized and financially supported by all seventy-two national members. For example, IUBS received support from fifty-three national members, while only thirty recognized the IUIS.

¹³⁹ Reported by T. Timothy Myoda, "Minutes of the EB-AIAMS Meeting, 17 August 1979," IAMS Newsletter no 4 (May 1980): 3-4.

¹⁴⁰ Reported by T. Myoda, IAMS Newsletter (May 1980): 9.

Although there was enough support to justify admission as a new union, the Admissions Committee of ICSU deferred consideration of the application because it found no evidence that the IAMS existed as a separate body from IUBS. Apparently, ICSU representatives demanded more than provisional union statutes. Rather than wait until the 1982 Boston Congress, the Executive Board took immediate action. As authorized by the General Assembly at Munich, the statutes were changed to designate a separate union. To further a perception of independence, Seeliger informed the Secretary-Generals of IUBS and ICSU that the newly created IUMS had separated itself officially, thereby dissolving the Division of Microbiology of IUBS. In an effort to remain cordial to their former parent organization, Seeliger attempted to explain the precipitous exodus of microbiologists:

We sincerely and strongly regret the need to do this so abruptly because IUMS feels extremely grateful for the decision of GA/IUBS taken in August 1979 to support the creation of IUMS and its admission to ICSU. Unfortunately, according to information received from the Admission Committee on September 4, 1980, the statutory requirements of the procedures for admission to ICSU exclude the acceptance of a Union as long as it is a member or accommodated in another union and therefore not independent. We hereby express our deep gratitude to IUBS for the many years of fruitful cooperation.¹⁴¹

An Extraordinary General Assembly of the new IUMS was called at the 1981 Congress of Virology in order to ratify the new statutes. Furthermore, ICSU guidelines demanded that the proposed IUMS modify its bylaws to allow for greater geographic and disciplinary diversity among its Executive Board members. The application for ICSU membership was formally renewed on 2 May 1981, in due time for consideration at the 1982 ICSU General Assembly in Cambridge, U.K. However, formal admission was far from a certainty. There was some concern among the physics-related members that increasing number of biologically related unions would upset the balance of voting powers within ICSU and draw disproportionate UNESCO support.

The occurrence of the Extraordinary General Assembly should not be allowed to diminish the significance of the 5th International Congress for Virology (with fifty-five countries represented by over two thousand registrants). Among the ceremonial speeches, André Lwoff presented an opening address entitled "The Evolution of Virology," in which he outlined his vision of these Congresses for Virology:

The tradition has been to draw upon the common interests of virologists in fields as varied of molecular biology, biochemistry, genetics, immunology, pathology, ecology and epidemiology. In this day of specialization, this breadth in scientific programme is exceptional, but indeed the Strasbourg programme did achieve balance, depth and 'cross-fertilization' across these diverse subject areas.

Many virologists believed that separate congresses, freed from the domination of bacteriological interests, would have a chance to fulfill Lwoff's characterization of cross-fertilizations.

The size of the Fourteenth Congress (Third Intersectional Congress) was reminiscent of many of the earlier International Congresses for Microbiology. The scientific program at Boston

¹⁴¹ Heinz Seeliger, Wurzburg, to P. Ayensu, 6 September 1980. Reprinted in International Union of Microbiological Societies Newsletter no. 5 (June 1981): 4.

included fifty-eight symposia for bacteriology and seventeen for mycology. In addition, eleven round-tables and seventy-nine poster sessions were scheduled.¹⁴² Total attendance approached twenty-five hundred participants. The scientific agenda covered virtually every aspect of modern microbiology. The delegates were welcomed by Congress President, Willis A. Wood, and from John Sherris, President of ASM. Nobel Laureate, David Baltimore, delivered a lecture on "Tumor Viruses as Amalgams of Viral and Cellular Information" before the opening session.

Thanks to the diligent work of the ASM organizing committee, the Boston Congress managed to augment the intersectional character of its gatherings. Seven out of the thirteen COMCOFs and twenty-one out of the twenty-eight subcommittee of the International Committee of Systematic Bacteriology held business meetings. Additionally, four intersectional symposia were held, while a new COMCOF, the Medical Microbiology Interdisciplinary Committee (MEMIC), was created. Although the Section of Virology did not hold a congress at Boston, nine symposia on bacteriophage topics were organized by Jonathan King. In an effort to increase the Mycology Division's role in the IUMS, two additional COMCOFs were proposed: an International Commission on Taxonomy of Fungi (ICTF) and an International Commission on Mycotoxicology (ICMT).

The general assemblies featured the presentation of the second Stuart Mudd Award to Leonardo J. Mata, Professor at the University of Costa Rica, and a short commentary on the future of the IUMS by immediate Past-President, Heinz Seeliger. Seeliger anticipated a new era in international microbiology. The increased visibility that accompanied the proposed union status created a plethora of opportunities to expand the role of microbiologists in the international scientific community. While lauding the separation of microbiology from other biological sciences, Seeliger was careful to note the intellectual ties of microbiology to its neighboring disciplines:

New methods in biochemistry, electron microscopy, genetics and mathematics - to mention only a few - have resulted in more insight into the functioning of more organisms, in breathtaking advances of genetic engineering and in great progress to make use of microbiological processes for creating better weapons against infectious diseases, against metabolic disorders and for improvement of nutritional resources for man, animals and plants.¹⁴³

Although union status was an act of separation, it did not connote isolation.

Once again, a new Executive Board was elected, this time with intent to increase geographic and scientific diversity among its members:

President	-	Philipp Gerhardt (USA)
Past-President	-	Heinz P.R. Seeliger
Vice-President	-	Kei Arima (Japan)
Vice-President	-	Włodzimierz Kurylowicz (Poland)
Secretary-General	-	Stuart Glover (UK)
Treasurer	-	Marian Horzinek (Netherlands)

¹⁴² The poster sessions at the Thirteenth Congress were well attended. Seven hundred and thirty-three abstracts for the poster sessions were published in the program and abstract book.

¹⁴³ Heinz Seeliger, "Address of the President at the 1st General Assembly of IUMS," International Union of Microbiological Societies Newsletter no. 7 (May 1983): 7.

Members at Large - P.R. Mahadevan (India); Robert G.E. Murray (Canada);
Victor M. Zhdanov (USSR)
Divisional Chairmen - Norman L. Goodman (USA); Frederick Murphy
(USA); Rita R. Colwell (USA)

The most rewarding event of 1982 transpired after the close of the Boston Congress. On September 16, at the ICSU General Assembly meeting in Cambridge, the IUMS was formally accepted as a separate union by the International Council of Scientific Unions. The act consummated an effort that was initiated in 1972, activated in 1974 by the IAMS General Assembly at Tokyo, adopted in 1978 by the IAMS General Assembly at Munich, and first considered by ICSU in 1980. The IUMS Newsletter triumphantly announced in the Spring of 1983:

ICSU membership is vitally important to microbiology internationally because it has raised the status of microbiology to equality with other major disciplines, provided microbiology with a direct voice and vote as a full scientific member in the primary scientific council of the world, and through this enabled microbiology to play a more active role in the national academies which make up the national membership of ICSU. IUMS now plans to reorganize and revitalize itself in order to fulfill the opportunity that come with this new status.¹⁴⁴

As part of that reorganization and revitalization, the newly constituted Executive Board reviewed its involvement with other international bodies. The new President and Secretary-General (Gerhardt and Glover respectively) believed that a more active role in WHO, UNEP, UNESCO, ICRO, etc., was justified. Moreover, the Executive Board approved plans to begin publishing an international journal of Microbiological Sciences, featuring review articles and IUMS news, as well as an International Journal of Food Microbiology.

However, the solidarity of the IUMS was increasingly threatened from within. Initially, the immediate post-Boston months witnessed the resignation of Zhdanov from the Executive Board. Fred Brown, a British Virologist, was chosen by postal ballot as his successor, increasing the number of Anglo/American representatives on the EB to seven of eleven members. A few observers remarked that the IUMS had neglected its goal of world-wide participation.

Secondly, and more importantly, rumblings of discontent swept through the Virology Division. Historically, bacteriology represented the oldest, largest and most active segment of the international society. However, by the late 1960's, participants from virology represented a sizeable portion of the worldwide microbiological community. Correspondence among virologists reveals an increasing dissatisfaction with their involvement in IAMS/IUMS activities and congresses. Talk of an independent association of virologists occasioned informal conversations at the Madrid Congress and at the Hague. The International Congress for Microbiology at Boston proved to be a watershed. At the Executive Board meetings, Virology Division chairman Frederick Murphy voiced the primary grievances: virology was under-represented on the Executive Board (two of ten members); the voting structure of the General Assemblies marginalized the interests of virologists (two of about thirty delegates to the Boston

¹⁴⁴ "IUMS Accepted as a Scientific Member of ICSU," International Union of Microbiological Societies Newsletter no. 7 (May 1983): 2.

GA were virologists); and financial practices of the IUMS impeded the administrative efforts of the virology division. (The financial basis of the IUMS, approximately \$50,000 in 1984, was derived from ICSU grants and levies on congresses at \$5 per registrant.) Since Congresses for Virology were held more frequently than others (once every three years) and were well attended, Murphy and others maintained that the Virology division was responsible for a substantial portion of the Union budget. Given the composition of the Executive Board and General Assembly, it appeared unlikely that virology activities would receive financial backing. In an open letter to virologists, Murphy explained:

The Bacteriology Division has so many committees and other organizations that have been supported in the past that large amounts of money are automatically earmarked. In this situation virologists are precluded from developing new initiatives requiring money.

At the 1982 International Conference of Comparative Virology in Banff, Canada, dramatic steps were taken. The Virology Division opted not to participate in the next International Congress for Microbiology. Furthermore, a straw vote was dealt in favor of founding an independent International Union of Virology (IUV). A resolution (submitted by the Canadian delegates) passed, suggesting a "withdrawal from all affiliation with the IUMS and establishment of an independent association or union of virologists," owing to a general consensus that in the past "the IUMS had not been responsive to the concerns of the Virology Division."

The resolution, taken either as an ultimatum or culmination of years of inclinations, was received with grave concern among IUMS Executive Board members. A series of forthright letters expressed realistic foreboding for the Union's future. Past-president Seeliger depicted the potential consequence:

It is clear to me that a separation of the Virology Division would be disastrous to IUMS. . . .The plans of some virologists were 'in the air', and it will be very difficult to prevent them to establish their own international body. . . .If their efforts succeed we might as well anticipate the mycologists doing the same, sooner or later, and then mycoplasmologists might follow.¹⁴⁵

In actuality, the venture to secede was fraught with difficulties. For example, many countries did not have separate societies for virology, only umbrella organizations covering all fields of microbiology, and therefore could not form an association of virological societies. Furthermore, most governments would not recognize new national societies or the International Association for Virology, nor would they likely offer immediate financial contributions.

These potential difficulties did not diminish the critical nature of the Virology Division's actions. As a "White Paper," listing pros and cons of secession, circulated widely in 1983, President Philipp Gerhardt and Secretary-General Glover responded quickly. They solicited recommendations for yet another structural overhaul of the Union, this time to liberalize as rapidly as possible within the existing Statutes. Yet, these actions were viewed by some as insufficient and conservative. At the 1984 Sendai Congress for Virology the Canadian motion was tabled in favor of a resolution that directed the Virology Division to instruct its "officers to

¹⁴⁵ Heinz Seeliger, Wurzburg, to Stuart Glover, Newcastle, 6 December 1982. And, Heinz Seeliger, Wurzburg, to Philipp Gerhardt, East Lansing, 6 December 1982.

negotiate with the IUMS for full equality with the Union and independent responsibility for all virological matters; and if these negotiations are not brought to a successful conclusion" that the "Virology Division should immediately move toward the formation of an independent Union."

In the waning weeks of 1984, Glover proposed a series of revisions allowing for: 1) greater autonomy for the divisions in the conduct of their affairs and the organization of their congresses, 2) a restructuring of the Executive Board to double membership by the division officers, 3) restructuring of the voting privileges at the General Assembly, 4) decentralizing the COMCOF's, and 5) replacing the International Congresses of Microbiology with Interdivisional Congresses every four years in association with a divisional congress. While these changes did not placate a few virology leaders, the IUMS enabled its continuance as a close federation. In Gerhardt's candid evaluation: "In particular, the Union is stronger for having retained virologists who had considered separation from our Union; we should remain united in the future."¹⁴⁶

Although not actively pursuing a path toward independence, the Mycology Division underwent a phase of dramatic growth and development in the early 1980's. While membership increased steadily, the Boston Congress coupled representatives from the International Society for Human and Animal Mycology and the International Commission of Yeast and Yeast-Like Organisms for a joint scientific program. However, the organizational status of the Mycology Division was soon called into question. Bids for the formation of an International Union of Mycology were intermittently announced, mostly from delegates of the International Mycological Association. The IMA constituted the Section of General Mycology within the Division of Botany and Mycology of the International Union of Biological Sciences. At the IUBS General Assembly in Ottawa in September of 1982, IUBS dissolved its divisional structure allowing sections and commission to group freely. Unlike the Mycology Division of IUMS, the IMA held congresses every six years, and took particular interest in mycological taxonomy.

At the third International Congress of Mycology held in Tokyo in 1983, IMA officials and IUMS representatives formed an *ad hoc* group to discuss relations between the two societies, but without ready agreement. Norman Goodman and Kazuo Iwata invited the IMA to affiliate with the IUMS Mycology Division under a loose federation of autonomous bodies. The IMA, in turn, encouraged the Mycology Division to secede from the IUMS. Neither proposal was accepted, and the delegates could only agree to establish closer ties and future collaborative endeavors where possible. A Mycology Division Position Statement was issued indicating that, "...while recognizing a basic responsibility to mycologists with microbiological interests, the Division is open to, and encourages, affiliation with any national, regional or international organization with compatible goals and objectives."

A renewed effort to unite the Mycology Division and the International Mycological Association prompted a series of meetings in 1986 under the auspices of the "Coordinating Group for the Organization of Mycology at the International Level." With USDA representative L.R. Banta as convener, the meetings were an outgrowth of the British Mycological Society and the Royal Society of London and were instructed to reduce the considerable overlap between the organizations. However, as negotiations progressed, it was apparent that the IMA members considered themselves more closely aligned with botanists, and were uninterested in an affiliation with bacteriologists.

¹⁴⁶ Philipp Gerhardt, "The State of the Union in 1986," Microbiological Sciences 3 (1986): 266.

Although tentative plans were considered for a joint IMA/Mycology Division congress in 1990, no settlement could be reached. John Webster, the president of the IMA concluded: The range of interests of IMA and IUMS (Mycology Division) does not exactly coincide, and there are probably advantages in keeping the two organisations separate. If this is accepted then the corollary is for there to continue to be separate Congresses. National Societies would then be faced with a clear choice of affiliating with none, one, or both organisations.¹⁴⁷

Mycology Division directors hoped that the loosening of IUMS structures would afford greater opportunities for collaboration with the IMA, ICYYLM (now the International Commission on Yeasts, ICY) and ISHAM.

The site of the Fourteenth International Congress for Microbiology was decided by postal ballot. Choosing among five countries, a majority of respondents selected Manchester, England, for the Fall of 1986. Under patronage of the Duke of Edinburgh and jointly sponsored by five British microbiological societies, "Microbe '86" included a broad, expansive scientific program, and well over three thousand participants from sixty-five countries. There was a concerted effort among conveners to introduce a number of younger microbiologist from developing countries while keeping the 'old boy' network in check.

The thirty-two symposia of the Bacteriology Division highlighted such topics as systematics, medical bacteriology, industrial and applied microbiology, molecular biology, ecology, and genetics. The Mycology Division offered ten symposia covering mycogenetics, mycotoxins, membranes, and mycorrhiza. Reflecting his interests in both bacteriology and virology, President of the Manchester Congress, Harry Smith, ensured that a virology program consisting of eight symposia and three workshops was carefully constructed, despite minimal participation from the Virology Division.

The program committee also offered a moderate intersectional program on ten topics of interest to a wide range of microbiologists (*e.g.*, recombinant DNA techniques, heterospecific gene expression, mixed infections, genetics and pathogenicity). Furthering the International Union's historical goal of promoting connections between scientific fields, the Bacteriology Division created a Medical-Veterinary Section. Program Committee member E.A. Dawes remarked, "the attraction of the Medical-Veterinary Section is unquestionably its interdisciplinary nature for it will bring together two groups of scientists who do not often meet yet who share many interests."¹⁴⁸

As was the case of the previous International Congress for Microbiology held in Great Britain (London, 1936), "Microbe '86" was a magnificent event. Princess Anne delivered an insightful address on the relationship between microbiology and the expectations of the public. The concern for the social interactions of microbiology was shared by Congress President Harry Smith:

My personal hope is that this orientation of our subjects will convince the politicians, public and the scientific establishment that microbiology is genuinely important to the nation.¹⁴⁹

¹⁴⁷ John Webster, "Minutes," *Ad Hoc* Committee meeting of IMA and IUMS Mycology Division, London, 1986.

¹⁴⁸ E.A. Dawes, "Bacteriology Programme," *Microbiological Sciences* 3 no. 5 (1986): 135.

¹⁴⁹ Quoted by John Stansell, "Putting Science to Work," *Microbe Messenger* (8 September 1986): 3.

Smith's fundamental approach to the applied aspects of science did not prevent the inclusion of symposia for "pure" microbiological research. Rather, the Manchester Congress was characterized by the integration of these theoretical and applied topics (*i.e.*, the symposia for virology proceeded from aspects of viral genetics to new methods of vaccine production).

The administrative decisions reached at the Manchester Congress were no less significant. The latest revisions of the statutes were ratified. The reorganization included the provision that the IUMS function as a federation of international as well as national societies, thus removing the ambiguous affiliations with such bodies as the International Society for Human and Animal Mycology and the Federation of European Microbiological Societies. It was hoped that this change would encourage further ties with international groups for parasitology, protozoology, algology and phytopathology.

The second stage of this reorganization placed a greater responsibility and authority in the hands of IUMS divisions. For example, the Bacteriology Division not only assumed the total administrative duties for those bacteriological activities but also those interdisciplinary projects (subsequently changing its name to Division of Bacteriology and Applied Microbiology). Additionally, the Divisional representation on the Executive Board was doubled, raising EB's inclusive number to thirteen. Despite his personal apprehensions, Kei Arima (Japan) accepted his election to the IUMS presidency, with the balance of the Executive Board comprised of:

Vice President	-	Frederick Brown (UK)
Vice President	-	Rita R. Colwell (USA)
Secretary General	-	Stewart W. Glover (UK)
Treasurer	-	Graham G. Stewart (Canada)
Member at Large	-	Margaret W. Loutit (New Zealand)
Member at Large	-	P. Matangkasombut (Thailand)
Divisional Chairmen	-	Aksel Stenderup (Denmark); Marc H.V. van Regenmortel (France); Shogo Sasaki (Japan)
Second Divisional Representatives	-	Robert A. Samson (Netherlands); Brian W.J. Mahy (UK); Nduka Okafor (Nigeria)

With the designation as a separate union, membership in IUMS increased dramatically. By 1986, a total of ninety-four member societies from fifty-eight nations were included in the federation, the largest number among the ICSU unions. Subsequently, the financial condition of the IUMS improved. Gerhardt and Glover had managed to solicit support from thirty "charter" (industry organization) members and the enlarged budget allowed for a consequent increase in special project grants to the COMCOFs and Divisions. However, this financial optimism was tempered by the severe cutbacks in UNESCO's budget, which reduced the ICSU subvention to IUMS.

Although the future of the IUMS could not be adequately foretold, outgoing President Gerhardt commented on the "State of the Union":

I believe I express a consensus opinion that the state of our Union is sound and that it has improved. Working together during these four years, we have become established and active among peers in the International Council of Scientific Unions, revised our statutes for a more

effective and broad confederation, helped to advance microbiological education and research in developing as well as industrialized regions, sponsored good meetings, published important new pamphlets and journals and improved the quality of existing ones, enlarged and improved our membership, and brought able and energetic people into service. The future of our Union appears as bright as it has been in the recent past.¹⁵⁰

Gerhardt's prophecy appeared to be accurate. The 7th International Congress of Virology at Edmonton drew nearly four-thousand registrants to participate in five plenary sessions, thirty-two symposia and thirty-three round table discussion. Ironically, the Virology Division experienced the same plight of expansion and scale that threatened International Congresses of Microbiology in previous decades. Marc van Regenmortel remarked: The Program Committee of large international congresses is invariably faced with two conflicting requirements, namely to create a forum for detailed discussion among fairly small groups of specialists, and to provide broad educational reviews of the current state of knowledge in certain facets of the discipline of particular interest at the time of the meeting.¹⁵¹

Nonetheless, Edmonton was a significant achievement, solidifying new administrative structures within the Virology Division while encouraging interactions across the diverse areas of research.

Unfortunately, another tragedy befell the Executive Board. Kei Arima died suddenly in late 1988, leaving the IUMS without a president. Shogo Sasaki was chosen by postal ballot as his replacement, thereby necessitating a change in the Bacteriology Division's leadership. As a memory to her husband's contribution to the IUMS, Mrs. Arima endowed an award in his name for research in the field of industrial microbiology.

Designs for 1990 congresses followed novel blueprints. No longer organized around "International Congresses for Microbiology," meetings were arranged by the individual divisions, with Interdivisional Congresses attached to one gathering. The Bacteriology and Mycology divisions combined efforts, with Osaka chosen as their primary site, while the Virology Division settled on Berlin. However, the location of the Interdivisional Congress and General Assembly had not been chosen at Manchester. Noting the three year cycle of the International Congresses of Virology, the Executive Board recommended Berlin. (Since the International Congresses of Virology were held on a three year cycle, an ICV would not occur in the same year as the Bacteriology/Mycology congresses until 2002.) The EB also believed that placing the Interdivisional Congress at Berlin would "foster strong links between the Division and the Union." This decision drew temporary criticism from the organizers of the Osaka Congress and those who feared that travel to Japan and Germany in the same summer would be cost-prohibitive for many microbiologists.

The Osaka gathering was christened "IUMS Congress: Bacteriology and Mycology, Osaka, Japan, 1990." An estimated three-thousand participants attended symposia in bacteriology, mycology, molecular biology, industrial microbiology and medical microbiology. (The Osaka Congress did not contain a virology program, and refrained from using the terms "virus" or "virology" in its program headings.) Due to the size of the congress, several symposia

¹⁵⁰ Philipp Gerhardt, "The State of the Union in 1986," *Microbiological Sciences* 3 no. 9 (1986): 267.

¹⁵¹ Marc van Regenmortel, "International Congress of Virology," *BioAssays* 5 (1986): 290-1.

and satellite meetings were held in Kyoto, Nara and Kobe. An extraordinary attendance of five-thousand was achieved in Berlin for the Congress for Virology. The congress included eighty workshops and three spirited round table discussions concerning: "ethics in virus research"; "environmental release of GEMS"; and "vaccination and control of virus diseases."

The "Second Interdivisional Congress of Microbiology" was held in conjunction with the 8th International Congress of Virology in August of 1990, featuring a two day program of three half-day symposia regarding aspects of medical microbiology: new developments in diagnosis of infectious diseases; prospects for control of the major infectious diseases of developing countries; and, impact of biotechnology on protection against infectious diseases. The General Assembly at Berlin announced the locations of future congresses (9th International Congress of Virology - Glasgow; International Congress of Bacteriology and Mycology - Czechoslovakia) and the election of officers to the Executive Board:

President	-	Rita R. Colwell (USA)
Vice President	-	K.I. Berns (USA)
Vice President	-	R. Mori (Japan)
Secretary General	-	Marc H.V. van Regenmortel (France)
Treasurer	-	Graham G. Stewart (Canada)
Member at Large	-	S.T. Chang (Hong Kong)
Member at Large	-	M. Kocur (Czechoslovakia)
Virology Division	-	Brian W.J. Mahy (UK)
Bacteriology Division	-	Y. Takeda (Japan)
Mycology Division	-	H. Jean Shadomy (USA)

Despite the dramatic reduction in ICSU/UNESCO subventions, IUMS heralded a new era of activity and promise. Microbiological Sciences was replaced by the World Journal of Microbiology and Biotechnology as the official journal of the Union, while Intervirology gave way to Archives of Virology. The COMCOFs, now under the direction of individual Divisions, forged new associations with other international scientific bodies in such endeavors as the Scientific Committee on Genetic Experimentation (COGENE), while assisting developing countries through Microbiological Resource Centres Network (MIRCENs) and the newly created Education Committee. (COGENE was added to the growing list of UNESCO sponsored committee which IUMS took part. CODATA and COBIOTECH were also frequent targets of IUMS interests along with SCOPE.) The Medical Microbiology Interdisciplinary Committee (MEMIC), founded in 1982, matured at the end of the decade, organizing symposia and conferences on such topics as diarrhoeal diseases, zoonoses, food hygiene, and nosocomial infections. The International Committee on Economic and Applied Microbiology (ICEAM) turned its attention to biotechnology, leading efforts toward safety regulations and technology transfers. For the one-hundred thousand plus members representing the ninety-four nations, the IUMS has become a more diversified, active body than ever before.

CONCLUSION

INTERNATIONAL MICROBIOLOGY: PAST, PRESENT AND FUTURE

Compared to the International Society for Microbiology of the 1930's, the contemporary International Union of Microbiological Societies is a vastly different organization. The six decades of intervening years have witnessed significant changes in the conceptual content of microbiology, in the organizational patterns of scientific societies and in the conditions of international cooperation. At the time of its foundation, the ISM represented a few hundred microbiologists. Today, that number approaches one hundred thousand. However, despite these changes, the history of international efforts in microbiology reveals a number of persistent themes. In many respects, the functions of the IUMS do not differ substantially from that of the ISM. The present day organization has merely found more elaborate and effective mechanisms to attain those same goals.

Firstly, international efforts in microbiology have attempted to promote international collaboration in general. Moreover, the scope of this collaboration was not limited to the intellectual realm. For microbiologists, an international society represented a means of transcending the geographical, political and economic boundaries of individual nations. Many participants believed that scientific collaboration would foster a climate of conciliation and friendship, even among non-scientists. The original statutes of the ISM contained a pacifist text which indicated that:

It is an International Society of Microbiology, created not only for the favorable production of science and the creation of more close relations among the diverse countries collaborating, but also reaffirms the uniform conviction of its members that the sciences unite the nations in an ideal of inalterable peace and constant solidarity.

The belief in internationalism has been at the forefront of IUMS actions, both past and present. International congresses and symposia have been held in nearly every region of the world, both in the East and the West. The Copenhagen and Mexico Congresses passed resolutions condemning biological warfare.

For the past three decades, there has been a conscious effort to promote microbiology in developing countries. The IUMS has sponsored or organized numerous training courses, fellowships, and scientific exchanges which have sought to reduce the scientific gap between industrialized and third world nations. Former Secretary-General Glover reemphasized the need to promote microbiology among the lessor developed countries. In a personal survey of the member societies, Glover found that:

Foremost among the needs recognized by correspondents were: (i) increased access to the primary literature of microbiology, most of which is published in the West and is expensive, (ii) increased opportunities for pre- and post-doctoral training microbiological laboratories, (iii) increased opportunities to attend congresses, conferences and symposia on microbiology, and (iv) increased opportunities to attend specialized laboratory courses.¹⁵²

¹⁵² Stuart Glover, "Third World Microbiology -- Educational Needs," Microbiological Sciences 8 no. 3

Secondly, as an international organization representing all areas of microbiology, the IUMS and its predecessors were "umbrella" organizations, serving to integrate the various fields and specialties of the discipline. This role is evident even in the context of current sectionalization of IUMS. The congresses and symposia continue to desegregate research interests. For example, a report of the Fifth International Congress for Virology, held in Strasbourg in 1981, contained the following introductory statement:

The central tradition of the International Congresses of Virology has been to bring together scientists studying the viruses of man, animals, plants insects and microorganisms. The tradition has been to draw upon the common interests of virologists in fields as varied as molecular biology, biochemistry, genetics, immunology, pathology, ecology and epidemiology. In this day of specialization, this breadth in scientific programme is exceptional, but indeed the Strasbourg programme did achieve balance, depth and "cross-fertilization" across these diverse subject areas.¹⁵³

The IUMS has been able to fulfill this integration function through a number of mechanisms. Intersectional congresses are still held at four year intervals, and "after sixty years, microbiology congresses have retained their initial usefulness and popularity and deserve to be continued."¹⁵⁴ The IUMS journal, World Journal of Microbiology and Biotechnology, provides review articles and summaries of all areas of microbiology. The journal also lists activities of the various divisions and COMCOFs, informing scientists of activities outside of their particular specialty.

The IUMS serves its "umbrella" function by addressing issues that cut across several fields and specialties. There has been a continued emphasis on the importance of taxonomy in microbiology. International Codes of Bacteriology and Virology have been published, and are periodically undergoing revision. An International Commission on Taxonomy of Fungi has been active in addressing the issues of nomenclature for mycology.

During the past decade, the IUMS separated itself from the broader International Union of Biological Sciences. Furthermore, the divisions of the IUMS have assumed a more independent role in promoting their sciences. However, these changes have not resulted in an isolation of the IUMS. On the contrary, the IUMS has sought to link microbiology with other disciplines and other international organizations. The IUMS maintains close relations with several UNESCO committees, the World Health Organization, the European Federation of Microbiological Societies, and many other non-governmental international agencies.

Thirdly, many of the interdisciplinary functions of IUMS involve areas of applied microbiology. For example, the International Microbial Genetics Commission (IMGC) of IUMS participated directly in many of the debates over the potential hazards of recombinant DNA technology. In an affiliation with the UNESCO Scientific Committee on Genetic Experimentation (COGENE), IMGC has advised policy makers in the United States and the U.K. Beginning with the formation of the International Committee on Economic and Applied

(1986): 239-9.

¹⁵³ "Report on the Vth International Congress of Virology," IUMS Newsletter no. 6 (March 1982): 8.

¹⁵⁴ Philipp Gerhardt, "The State of the Union in 1986," Microbiological Sciences 3 no.9 (1986): 266.

Microbiology at the 1962 Montreal Congress in 1962, the IUMS has enthusiastically promoted the diverse applications of microbiological research. The applied context of microbiology inalterably linked the IUMS with other disciplinary bodies. Former Secretary-General Senez observed:

Quite obviously, much more could and should be expected from the IAMS. Nowadays, Microbiology is of essential and fastly growing importance for fundamental biology, medicine, chemical industry, agriculture, environmental protection, food productions and preservation, and even space exploration. One can hardly think of any branch of modern technology not having some direct or indirect microbiological implication. In all these domains of science and technology, the IAMS represents a unique sum of international expertise which could and should be valorized for the benefit of mankind.¹⁵⁵

The accomplishment of these persistent goals has not been easy. The International Society for Microbiology, the International Association of Microbiologists, and the International Association of Microbiological Societies each suffered from a plethora of administrative shortcomings. The organizations were without adequate funds, administrative staff or statutory authority. Many members of these international bodies viewed their function as being limited to the organization of periodic congresses. However, not everyone shared such a limited vision. The history of the predecessors to the IUMS is fortunate to include accounts of a few determined General-Secretaries. If these organizations were successful in promoting international microbiology, it was due to the efforts of such individuals as R. Dujarric de la Rivière, Ralph St. John-Brooks, Giuseppe Penso, Norman Gibbons and Stuart Glover.

The International Union of Microbiological Sciences finds itself in a slightly different position today. While far from laden with riches, the IUMS has managed to financially support many activities of its COMCOFs and divisions. It maintains an active administrative office, and has been effective in gathering support from ICSU and UNESCO for such purposes as hosting training programs in medical mycology.

Although the IUMS has entered a new era of activity, it is unlikely that it will lose its former characteristics. More than in any time in the past, there is a profound need for an organization that seeks to encourage international collaboration, promote scientific integration, and provide solutions to practical concerns.

¹⁵⁵ Jacques Senez, IAMS Newsletter no. 3 (August 1979): 21.

**APPENDIX-- IUMS OFFICERS
AND INTERNATIONAL CONGRESSES FOR MICROBIOLOGY**

MYCOLOGY DIVISION (SECTIONAL) EXECUTIVE OFFICERS

1990-1994:

Chairman	-	H. Jean Shadomy (USA)
Vice Chairman	-	L. Polonelli (Italy)
Secretary	-	I. Russell (Canada)
2nd E.B. Member	-	Robert A. Samson

1986-1990:

Chairman	-	Aksel Stenderup (Denmark)
Vice Chairman	-	H. Jean Shadomy (USA)
Secretary	-	Graham G. Stewart (Canada) ¹⁵⁶
2nd E.B. Member	-	Robert A. Samson (Netherlands)

1982-1986:

Chairman	-	Norman L. Goodman (USA)
Vice Chairman	-	Aksel Stenderup (Denmark)
Secretary	-	H. Jean Shadomy (USA)

1978-1982:

Chairman	-	Kazuo Iwata (Japan)
Vice Chairman	-	Norman L. Goodman (USA)
Secretary	-	H. Jean Shadomy (USA)

1974-1978:

Chairman	-	Everett S. Beneke (USA)
Vice Chairman	-	Kazuo Iwata (Japan)
Secretary	-	Norman L. Goodman (USA)

¹⁵⁶ resigned to take IUMS sec/treas position, Inge Russell acted as interim.

VIROLOGY DIVISION (SECTION) EXECUTIVE OFFICERS

1990-1993:

Chairman	-	Brian W.J. Mahy (UK)
Vice Chairman	-	Ralf Petterson (Finland)
Secretary	-	H. Zeichhardt (Germany)

1987-1990:

Chairman	-	Marc H.V. van Regenmortel (France)
Vice Chairman	-	Brian W.J. Mahy (UK)
Secretary	-	Marian C. Horzinek (Netherlands)
2nd EB Member	-	Brian W.J. Mahy (UK)

1984-1987:

Chairman	-	Erling Norrby (Sweden)
Vice Chairman	-	Marc H.V. van Regenmortel (France)
Secretary	-	R.I.B. Francki (Australia)

1981-1984:

Chairman	-	Frederick A. Murphy (USA)
Vice Chairman	-	Erling Norrby (Sweden)
Secretary	-	R.I.B. Francki (Australia)

1978-1981:

Chairman	-	J.P.H. van der Want (Netherlands)
Vice Chairman	-	Frederick A. Murphy (USA)
Secretary	-	Erling Norrby (Sweden)

1975-1978:

Chairman	-	Peter Wildy (UK)
Vice Chairman	-	J.P.H. van der Want (Netherlands)
Secretary	-	Erling Norrby (Sweden)

1971-1975:

Chairman	-	Joseph L. Melnick (USA)
Vice Chairman	-	Peter Wildy (UK)
Secretary	-	Nils Oker-Bloom (Finland)

BACTERIOLOGY DIVISION (SECTION) EXECUTIVE OFFICERS¹⁵⁷

1990-1994:

Chairman	-	Yoshifumi Takeda (Japan)
Vice Chairman	-	Peter D. Walker (UK)
Secretary	-	Mah-Lee Ng (Singapore)

1986-1990:

Chairman	-	Shogo Sasaki (Japan) ¹⁵⁸
Vice Chairman	-	Margaret W. Loutit (New Zealand)
Secretary	-	Peter D. Walker (UK)
2nd EB Member	-	Nduka Okafor (Nigeria)

1982-1986:

Chairman	-	Rita R. Colwell (USA)
Vice Chairman	-	Shogo Sasaki (Japan)
Secretary	-	Margaret W. Loutit (New Zealand)

1978-1982:

Chairman	-	Sam Faine (Australia)
Vice Chairman	-	Rita R. Colwell (USA)
Secretary	-	Margaret W. Loutit (New Zealand)

1974-1978:

Chairman	-	Daizo D. Ushiba (Japan)
Vice Chairman	-	Sam Faine (Australia)
Secretary	-	Rita R. Colwell (USA)

1970-1974:

Chairman	-	Jacques C. Senez (France)
Secretary	-	Rita R. Colwell (USA)

¹⁵⁷ Now designated Division of Bacteriology and Applied Microbiology.

¹⁵⁸ Assumed Presidency of IUMS in 1988, replaced by Margaret Loutit.

IUMS EXECUTIVE OFFICERS¹⁵⁹

1990-1994:

President	-	Rita R. Colwell (USA)
Vice President	-	Kenneth I. Berns (USA)
Vice President	-	Ryoichi Mori (Japan)
Secretary General	-	Marc H.V. Regenmortel (France)
Treasurer	-	Graham G. Stewart (Canada)
Member at Large	-	Shu-Ting Chang (Hong Kong)
Member at Large	-	Miloslav Kocur (Czechoslovakia)
Divisional Chairmen	-	H. Jean Shadomy (USA); Brian W.J. Mahy (UK); Yoshifumi Takeda (Japan)

1986-1990:

President	-	Kei Arima (Japan) [replaced in 1988 by Shogo Sasaki]
Vice President	-	Frederick Brown (UK)
Vice President	-	Rita R. Colwell (USA)
Secretary General	-	Stewart W. Glover (UK)
Treasurer	-	Graham G. Stewart (Canada)
Member at Large	-	Margaret W. Loutit (New Zealand)
Member at Large	-	P. Matangkasombut (Thailand)
Divisional Chairmen	-	Aksel Stenderup (Denmark); Marc H.V. van Regenmortel (France); Shogo Sasaki (Japan)
Second Divisional Representatives	-	Robert A. Samson (Netherlands); B.W.J. Mahy (UK); Nduka Okafor (Nigeria)

1982-1986:

President	-	Philipp Gerhardt (USA)
Vice President	-	Kei Arima (Japan)
Vice President	-	Wlodzimierz Kuylowicz (Poland)
Secretary General	-	Stewart W. Glover
Treasurer	-	Marian C. Horzinek (Netherlands)
Member at Large	-	P.R. Mahadevan (India)
Member at Large	-	Robert G.E. Murray (Canada)
Member at Large	-	Victor M. Zhdanov (1982) [Frederick Brown (UK) 1983- 1986]
Divisional Chairmen	-	Norman L. Goodman (USA); Frederick Murphy (USA) Rita R. Colwell (USA)

¹⁵⁹ Previously International Association of Microbiological Societies (IAMS), International Association of Microbiologists (IAMB), and International Society for Microbiology (ISM).

1978-1982:

President	-	Heinz P.R. Seeliger (FDR)
President Elect	-	J. Roger Porter (USA) [replaced in 1980 by Philipp Gerhardt as member at large]
Secretary General	-	Jacques C. Senez (France)
Treasurer	-	Stewart W. Glover (UK)
Member at Large	-	Wlodzimierz Kurylowicz (Poland)
Sectional Chairmen	-	Kazuo Iwata (Japan); J.P.H. van der Want (Netherlands); Sam Faine (Australia)

1974-1978:

President	-	Sir A. Ashley Miles (U.K.)
President Elect	-	Heinz P.R. Seeliger (FDR)
Secretary General	-	Jacques C. Senez (France)
Assistant Secretary	-	Fabian Fernandes (India)
Sectional Chairmen	-	Everett S. Beneke (USA); Peter Wildy (UK); Daizo D. Ushiba (Japan)

1970-1974:

President	-	Victor M. Zhdanov (USSR)
President Elect	-	Sir A. Ashley Miles (UK)
Secretary General	-	Norman E. Gibbons (Canada)
Sectional Chairmen	-	Jacques Senez (France); Everett S. Beneke (USA); Joseph Melnick (USA)

1966-1970:

President	-	André Lwoff (France)
President Elect	-	Victor M. Zhdanov (USSR)
Vice President	-	Carl-Göran Hedén (Sweden)
Secretary General	-	Norman E. Gibbons (Canada)
Treasurer	-	Maurice Welsch (Belgium)
Member at Large	-	Sam T. Cowan (UK)
Member at Large	-	Daizo Ushiba (Japan)

1962-1966:

President	-	André Lwoff (France)
Vice President	-	Carl-Göran Hedén (Sweden)
Secretary General	-	Norman E. Gibbons (Canada)
Treasurer	-	Maurice Welsch (Belgium)
Member at Large	-	V.D. Timakov (USSR)

1958-1962:

President	-	Stuart Mudd (USA)
Secretary General	-	Carl-Göran Hedén (Sweden)
Vice President	-	A. Ashley Miles (UK)
Treasurer	-	Maurice Welsch (Belgium)

1953-1958:

President	-	Sir Frank MacFarlane Burnet (Australia)
Vice President	-	A. Ashley Miles (UK)
Vice President	-	Stuart Mudd (USA)
Secretary General	-	Giuseppe Penso (Italy)
Treasurer	-	Maurice Welsch (Belgium)

1950-1953:

President	-	Olympia de Fonseca (Brazil)
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1947-1950:

President	-	Thorvald Madsen (Denmark)
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1939-1947:

President	-	Thomas M. Rivers (USA)
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1936-1939:

President	-	John C.G. Ledingham (UK)
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1927-1930:

President	-	Jules Bordet (Belgium)
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CONGRESSES

International Congresses of Microbiology

1930 -- Paris	1st
1936 -- London	2nd
1939 -- New York	3rd
1947 -- Copenhagen	4th
1950 -- Rio de Janeiro	5th
1953 -- Rome	6th
1958 -- Stockholm	7th
1962 -- Montreal	8th
1966 -- Moscow	9th
1970 -- Mexico City	10th
1974 -- Tokyo	11th (1st Intersectoral Congress)
1978 -- Munich	12th
1982 -- Boston	13th
1986 -- Manchester	14th ¹⁶⁰
1990 -- Berlin	2nd Interdivisional Congress

International Congresses of Virology

1968 -- Helsinki	1st
1971 -- Budapest	2nd
1975 -- Madrid	3rd
1978 -- The Hague	4th
1981 -- Strasbourg	5th
1984 -- Sendai	6th
1987 -- Edmonton	7th
1990 -- Berlin	8th (jointly with Interdivisional Congress)
1993 -- Glasgow	9th

International Mycological Congresses

(Sponsored by Mycology Division or the Section on Mycology)

1978 -- Munich	(with ICM)
1982 -- Boston	(with ICM)
1986 -- Manchester	(with ICM)
1990 -- Osaka	(Jointly with Bacteriology Congress)

¹⁶⁰ Last of the series of International Congresses of Microbiology.

International Bacteriology Congresses

1973 -- Jerusalem

1974 -- Tokyo (with 1st Intersectional Congress)

1978 -- Munich (with XII ICM)

1982 -- Boston (with XIII ICM)

1990 -- Osaka