

*INTERNATIONAL CONGRESSES*<sup>1</sup>

THE pursuit of science has from early times developed friendships among men of the most varied nationalities. These friendships have persisted even in times of war between their nations. Intercourse has been promoted by private correspondence and by means of periodicals. With improved methods of transportation the desire of more personal intimacy was gratified, and the value of harmony and cooperation recognized.

The necessity of international congresses appears to have been first appreciated by chemists. A purely international congress of chemists was planned in 1859 for the spring of 1860, but later it was decided to fix the meeting at Carlsruhe on the third of September in the same year. Letters of invitation were addressed to eminent chemists, and the response was encouraging. The meeting was attended by one hundred and forty chemists from all parts of Europe and lasted for three days. Most of the time was devoted to a discussion having reference to the best method of expressing the composition of chemical substances in the symbolic notation, and the debate on this point was very animated. (Appendix I.) The hope was generally expressed that this meeting would not be the last. However, no more congresses of chemistry of an international character were held until 1889. Nevertheless, the value of these was recognized and certain efforts were made to revive the movement of 1859 at frequent intervals; but the international conventions of chemists were limited to a discussion of the exhibits showing the development of chemical productions at the international expositions of Paris (1867, 1878, 1889), Moscow (1872), Vienna (1873), Wilna (1873), Philadelphia (1876), Düs-

seldorf (1880) and Milan (1881). Quite a number of chemists usually attended these exhibitions as members of juries of awards as well as through personal interest, and it appears that they served to induce informal assemblage and exchange of opinion. However, with the rapid development of our science and its applications, it soon became apparent that the discussion of problems could be advantageously transacted in convention as well as in journals, especially since the personal exchange of views in informal and social manner had been found by local and national (chemical societies) conventions to be particularly beneficial.

On July 30, 1889, the International Congress of Chemistry was opened in Paris by Berthelot, who exposed the objects of the congress as follows:

Theories are not to be considered, but only practical questions, such as relate to analytical methods and nomenclature. The last urgently needs revision and improvement. The system hitherto followed has become insufficient. So many new compounds have been discovered that they are bursting through the frames formerly intended, and thought wide enough, to contain them. . . . We can not keep on adding syllables and forming endless names for new combinations. A new and clearer system is absolutely necessary, with lines broad enough to last for some time at least.

In object, then, this congress was similar to the one at Carlsruhe. More important matters were discussed, however, and views of an influential nature were expressed on the testing and analysis of chemical products, particularly organic bodies, alimentary substances and pharmaceutical preparations.

The necessity of international congresses of science having become appreciated, principally owing to the recognition of the value of international associations among men of science, since such assemblages were found to serve as a medium for the fruitful

<sup>1</sup>Read before the New York Section of the American Chemical Society, October 7, 1910.

interchange of views, these organizations have increased to a large number (Appendix II.)—to such an extent, in fact, that some begin to overlap, and the fear has been expressed that varied attempts to advance knowledge by organization may result in discouraging individual effort. For the obviation of conflict, it has been suggested that the International Association of Academies have the ultimate control of every new international undertaking. In purely scientific organizations of an international character this may be desirable, but the congresses of applied science have demonstrated their value and will continue to exist without ulterior control—although cooperation is expedient—since their fields are sufficiently restricted and interdependent, that fine academic discrimination is not required.

Schuster<sup>2</sup> has distinguished three types of international organizations. According to him, the first aims merely at collecting information; the second is intended to fix fundamental units or to initiate agreements on matters in which uniformity is desired; while by the third type of organization a more direct advance of knowledge is aimed at and research is conducted according to a combined scheme. We may say in general, however, that an international organization does not entirely come within any single one of these divisions, but it is of value to classify the associations according to their main purpose.

In 1893, the World's Congress Auxiliary and the American Chemical Society united in calling a meeting of the chemists of the world to attend a general chemical congress. This was held in connection with the Columbian Exposition in Chicago, and about two hundred attended. The efforts made by the organizing committee were followed with most gratifying success, and the

chairman, H. W. Wiley, suggested the establishment of a triennial international congress of chemistry to meet at various centers. This recommendation was taken under consideration and initiated a movement which resulted in the formation of a permanent congress. A committee representing the American Chemical Society requested the chemical societies of the world to appoint similar committees of conference, in order to consider whether it was desirable and practicable to organize a series of international chemical congresses, "in which the chemists of the various nations can regularly meet together for a discussion of questions of common interest." How favorable the response was, will be apparent from what follows.

The first International Congress of Applied Chemistry was held at Brussels, under the patronage of the Belgian government, in 1894. It was divided into four sections. The first of these dealt with sugar chemistry, and here analytical questions were discussed. In the second section, agricultural chemistry, attention was paid especially to the determination of phosphoric acid. Section III., food and public hygiene, was rather general in its aims, but the congress endeavored to settle the minima of impurity allowable in distilled liquors and the best process for fixing the melting points of fats. The fourth section dealt with biological chemistry. At this congress it was decided to hold the meetings biennially and Paris was selected for the reunion in 1896.

The second International Congress of Applied Chemistry was opened under the patronage of the French government, and lasted ten days. To promote the interests of the congress committees had been organized in most countries, and through the French Foreign Office all the principal governments were invited to send dele-

<sup>2</sup> *Nature*, 74, 233.

gates. The attendance at this congress was large, and it showed the necessity of a close alliance between pure and applied science. Among the most important papers presented were those by Moissan on the electric furnace, which induced a highly important discussion on electrolytic problems and methods; Joly, on the applications of electro-chemistry; Grandeau, on the assimilability of the phosphates; Lippmann, on color photography; Kjeldahl, on the methods of determining nitrogen; Boroma, on the employment of aluminum in the construction of utensils; and Fernbach, on the utilization of the carbon dioxide arising from fermentation. Among the many interesting and important discussions may be mentioned those on the official graduation of instruments of precision, those on urine analysis, and those on food analysis. Nearly 2,000 members were present at the Paris meeting, and it required five large volumes to contain the report of the proceedings.

The third International Congress of Applied Chemistry was held in Vienna in 1898. The work was divided into twelve sections, and one of the chief questions before the congress was the adoption of uniform methods of analysis for commercial products and raw materials.

The fourth congress was held in Paris in 1900, and Moissan had charge of the selection of the committee of organization. This congress was held at the time of the Grand Exposition.

The fifth congress was held in Berlin in June, 1903. The imperial government had notified foreign governments officially of the meeting. Over 2,500 chemists attended and about 500 papers were presented for discussion. Several German societies held their meetings in conjunction with the congress, which was the most important and successful of all held up to that time.

The sixth International Congress of Applied Chemistry was opened at Rome in April, 1906. Its work was divided into eleven sections, and in each section an extensive program was arranged. Ramsay gave an address on the purification of sewage; Moissan lectured on the distillation of metals, and Frank on the direct utilization of atmospheric nitrogen. About 580 contributions were published in the "Atti" of the congress, occupying five large volumes.

The seventh congress was held in London from May 27 to June 2, 1909. The annual meeting of the Society of Chemical Industry was arranged at the same time, as well as several international organizations which dealt with special subdivisions of chemistry. As is well known on account of its recent occurrence, this congress was a worthy successor to the six preceding ones. It was divided into eleven sections with several subsections, making a total of seventeen in actuality, and was under the presidency of Rosecoe and Ramsay. A characteristic feature of the London congress was the extension of the idea of the establishment of international commissions to recommend uniform standards of materials and methods for determining them.

The eighth congress is to be held in the United States under the presidency of Morley and Nichols. It is our good fortune to have Dr. W. H. Nichols, a charter member of the American Chemical Society and the active president of the congress, with us. This captain of American applied chemistry will tell us something of the aims and plans as far as determined for the next congress.

#### APPENDIX I

A short account of the Karlsruhe Congress of 1860 will no doubt be interesting.

Boussingault, who presided on the opening day (September 4), presented the following questions for discussion:

1. Would it be judicious to establish a difference between the term *atom* and *molecule*?

2. Would it be judicious to designate by the term *molecule* the smallest quantity of a body capable of entering into combination?

3. Would it be judicious to designate by the word *atom* the smallest quantity of a body existing in combination?

4. Should the term *compound atom* be suppressed and replaced by the words *residue* or *radical*?

5. Is the idea of equivalents empirical and independent of the idea of *atom* or *molecule*?

Kekule spoke upon the first three questions. He laid emphasis on the necessity for distinguishing between *atom* and *molecule*; furthermore, he insisted at some length upon the distinction which should be established, in his opinion, between the physical and chemical molecule, which are not always identical. He advanced the opinion that the size of the chemical molecule would always be of value in assisting purely chemical researches, and without the aid of any physical considerations.

Cannizzaro, in an impromptu address remarkable for profundity and style, combated the ideas of Kekule. He opined that the chemical and physical molecules were absolutely identical—that they could not be distinct one from the other. The gaseous molecule represented the chemical molecule, and it was impossible to conceive any other idea of a molecule. Secondly, the value of the chemical molecule could only be established in a certain manner, that is to say, by the vapor density, which alone could serve to establish the true formula of a compound.

Wurtz suggested that the congress should withhold any decision upon the distinction raised between the physical and chemical molecule. He thought that upon the first three questions they would all agree, so he passed on to the fourth proposition. Many chemists, among them Cannizzaro, Miller, Kekule and Persoz, spoke upon this subject, and their opinions were divergent. Therefore, after a very long discussion, the decision was adjourned, especially since the assembly appeared to be divided as to the resolution which they should come to. It should be mentioned here that the entrance of the illustrious Dumas, whose advent before the conclusion of the meeting was greeted with loud applause, did not apparently conduce towards an agreement on the question under discussion. On the fifth proposition of the commission being presented, it was put to vote and adopted.

On the fifth of September, with Dumas in the chair, the following propositions were presented for consideration:

1. Would it be desirable to place chemical notation in harmony with the progress of science?

2. Would it be judicious to adopt the principles of Berzelius, with the introduction of the necessary modifications?

3. Should any new signs be added to the number of symbols now in use?

Cannizzaro spoke first. The first question, he asserted, only required asking to be answered. An ardent defender of the unitary system, he did not see that it was necessary to preserve the notation of Berzelius, but would adopt that of Gerhardt. A compromise which would modify the binary system so as to introduce part of the unitary system seemed to him quite inadmissible; it would oblige chemists to resort to retrogression. It seemed preferable to him, therefore, to start from Gerhardt's theory, and to discuss his plan and modify it in parts if found necessary. The eloquent chemist of Genoa then discussed the fundamental ideas of the unitary system; in his remarkable plea in favor of the theories of Gerhardt, he was obliged to show the impossibility, in the actual state of science, to adopt any other notation than that of the unitary system. He concluded by requesting of all to admit at least in principle the new notation, and consequently employ the barred letters to represent the simple bodies corresponding to two volumes.

Strecker, Kekule, Will, Erdmann and Kopp spoke successively, some to corroborate the proofs given by Cannizzaro and to strengthen the doctrine which he defended, and others to combat it. All agreed, however, to adopt the use of the barred letters. Dumas considered that the time had not yet arrived to adopt a definite mode of notation; he expressed the desire that the modifications which were rendered necessary by the recent progress of chemistry be added to the system of Berzelius, while awaiting the final settlement of the question. One necessary point to which he directed the attention of the congress was the importance of looking at the requirements of instruction. In this respect, unity of language and theory seemed to be most desirable. Therefore, by an entire freedom in the drawing up of scientific memoirs the professors should endeavor to smooth as much as possible the difficulties produced by the divergence in these theoretical ideas.

To summarize the results of this congress, it may be said that every one present was agreed

as to the necessity of putting the language of chemistry in harmony with the actual state of the science; but the unanimous opinion of the assembly was that entire liberty in this respect was indispensable to the progress of the science. In defence of the views of Cannizzaro, however, it may be said that even though views have considerably changed and clarified since his time, and although one is compelled to regard the types of Gerhardt as insufficient from the modern point of view, yet the general character and comprehensive nature of Gerhardt's system leave little to be desired, and Gerhardt's services to chemistry have never been questioned.

#### APPENDIX II

##### LIST OF INTERNATIONAL SCIENTIFIC CONGRESSES EXCEPT CHEMISTRY<sup>1</sup>

###### *Agriculture*

- International Congress for Agriculture and Forestry. Vienna, 1890.
- International Agricultural Congress. The Hague, 1891. Seventh meeting: Wien, 1907.
- International Horticultural Society. Chicago, 1893.
- International Congress of Tropical Agriculture. Paris, 1905; Brussels, 1910.
- International Institute of Agriculture. Rome.
- International Congress for Dairy Husbandry. Fifth meeting: Stockholm, 1910.
- International Congress of the Sugar and Distillery

<sup>1</sup>It is difficult to trace the careers of some of the international congresses of science; the above list is compiled more to indicate the extent to which international science has been fostered, rather than to serve as a record of the present day. However, wherever the present status of the various organizations is referred to in the journals of science, this is pointed out in the list. In order to discriminate between an international "conference" and "congress," the former term has been held to imply in its strict sense a committee or delegate meeting.

Various celebrations have really partaken of the nature of distinct congresses; for example, the International Celebration of the Jubilee of the Coal Tar Industry at London in 1906. Still other organizations have held or have initiated congresses which have been more or less of an international nature, although limited to only certain countries; for example, the Fifteenth Congress for Wine Culture at Heilbronn in 1896. National congresses are not given.

Interests. Second meeting: Paris, 1908.

###### *Anatomy*

- International Congress of Anatomists. Geneva, 1905; Würzburg, 1907.

###### *Anthropology*

- Universal Races Congress. London, 1911.
- International Congress of the Ethnographic Sciences. Paris, 1889, 1900.
- The Museums Association. Fourteenth Congress: Aberdeen, 1903.
- International Reunion of Anthropologists. Cologne, 1907.
- International Congress of Criminal Anthropology. Cologne, 1911.

###### *Archeology*

- International Congress of Prehistoric Archeology and Zoology. Moscow, 1892.
- Congress of Archeological Societies. The ninth convention took place in London in 1897.
- International Congress of Anthropology and Prehistoric Archeology. The fourteenth meeting occurred in Dublin, in 1909.
- International Congress of Archeology. Second meeting: Cairo, 1909.

###### *Arts*

- International Literary Congress. 1878.
- International Literary and Artistic Congress. Antwerp, 1885.
- International Shorthand Congress. Third meeting: Munich, 1890.
- International Congress of Arts and Science. St. Louis, 1904.
- International Society of Sculptors, Painters and Gravers. 1909.

###### *Astronomy*

- International Astronomical Association. Seventh Congress: Budapest, 1898.
- International Geodetic Association. London, 1909; Brussels, 1910.
- International Union for Cooperation in Solar Research. Oxford, 1905; Meudon, 1907; Mt. Wilson, 1910.
- Conference Astrophotographique Internationale de Juillet. 1900.
- Congrès International de Chronometrie. Paris, 1900.
- International Congress of Navigation. St. Petersburg, 1908.

###### *Botany*

- International Botanical Congress. Vienna, 1905; Berlin, 1906; Brussels, 1910.

International Plant Fiber Congress. Surabaya, 1911.

*Bromatology (vide Hygiene)*

International Congress for the Repression of Adulteration and Frauds in Foods and Drugs. Four of these congresses have been proposed under auspices of the Society of the White Cross of Geneva.

International Congress of Analytical Chemists and Microscopists. Vienna, 1891.

International Congress of Alimentary Hygiene and the Rational Feeding of Man. Brussels, 1910.

International Congress on Pure Foods and Alimentary Substances. Second congress: Paris, 1909.

*Chemistry*

(See in body of text above.)

*Education*

International Congress on Technical Education. Brussels, 1880; Bordeaux, 1886 and 1895; London, 1897.

Congress on Education. Paris, 1889.

International Congress of Education. St. Louis, 1904.

International Congress on Moral Education. 1908.

*Electricity and Physics*

International Electro-Technical Congress. Frankfurt, 1891.

International Conference on Terrestrial Magnetism and Atmospheric Electricity. Bristol, 1898.

International Physical Congress. Paris, 1900.

International Electrical Congress. Fifth congress: St. Louis, 1904.

Roentgen Congress. Berlin, 1904.

International Congress on Radiology and Ionization. Liege, 1905.

International Congress of Electrotherapy and Radiology. Amsterdam, 1908.

International Congress of Radiology and Electricity. Brussels, 1910.

International Electrical Conference. London, 1908.

International Office for Weight and Measures. Brussels, 1910.

International Photographic Congress. Fifth meeting: Brussels, 1910.

*Engineering*

Congrès International de Mécanique appliquée. Paris, 1890.

International Congress for the Unification of Methods of Testing. Meetings have been held

in Munich, Dresden, Berlin, Vienna, Zürich and Stockholm (1897).

International Testing Conference. Brussels, 1906.

International Association for Testing Materials. Fifth congress: Copenhagen, 1909.

International Congress for Mining and Metallurgy. Fifth meeting: Düsseldorf, 1910.

International Aeronautical Conference. Paris, 1896; Strassburg, 1898.

International Congress on Aerial Locomotion. Verona, 1910.

International Congress of Naval Architects and Marine Engineers. London, 1897.

Congress of the International Institutes for the Iron and Steel Industries. Wien, 1907.

International Engineering Congress. Glasgow, 1901; St. Louis, 1904.

International Roads Congress. Paris, 1908; Brussels, 1910.

International Congress of Refrigeration. Second meeting: Vienna, 1910.

*Fisheries*

International Sea Fisheries Congress. Sables-d'Olonne, 1896; Dieppe, 1898.

International Fishery Congress. Washington, 1908 (fourth meeting).

*Folk-Lore*

International Folk-Lore Congress. Second congress: London, 1891.

*Geography*

International Geographical Congress. London, 1895; Berlin, 1899; Geneva, 1908; Rome, 1911.

International Maritime Congress. London, 1893.

International Conference for the Exploration of the Sea. Stockholm, 1899; Christiania, 1900.

International Council for the Study of the Sea. Sixth meeting: London, 1907.

*Geology*

International Geological Congress. Eleventh meeting: Stockholm, 1910.

International Congress of the Petroleum Industry. Third meeting: Bucharest, 1908; fourth meeting: London, 1909.

*Hygiene (vide Bromatology and Medicine)*

International Sanitary Conference. Paris, 1894.

International Congress of Hygiene and Demography. Fourteenth meeting: Berlin, 1907.

International Congress on School Hygiene. Nuremberg, 1904; London, 1907; Paris, 1910.

International Congress on Alimentary Hygiene. Brussels, 1910.

International Congress of Hygiene and Medicine. Buenos Ayres, 1910.

#### *Mathematics*

International Mathematical Congress. Zürich, 1897; Paris, 1900; Heidelberg, 1904; Rome, 1908; Cambridge, England, 1912. This congress is also referred to as the International Congress of Mathematicians.

International Statistical Congress. Twelfth congress: Paris, 1909.

#### *Medicine*

International Veterinary Congress. Ninth meeting: The Hague, 1908.

International Medical Congress. Budapest, 1909 (sixteenth meeting).

Congress of Internal Medicine. Vienna, 1908.

International Conference on the Sleeping Sickness. London, 1907 and 1908.

Pan-American Medical Congress. Fifth meeting: Guatemala, 1908.

International Conference on Tuberculosis. Fifth meeting: The Hague, 1907; Berlin, October, 1910; also Brussels, 1910.

International Congress on Tuberculosis. Washington, 1908; Rome, 1911.

Congress of Stomatology. Paris, 1907.

International Congress of Hydrology, Climatology and Medical Geology. Eighth meeting: Algiers, 1909.

International Physiotherapeutic Congress. Paris, 1910 (third meeting).

International Association of Medical Museums. Washington, 1907.

International Congress on Provision for the Insane. Vienna, 1908.

International Congress of Psychiatry and Neurology. Amsterdam, 1907.

International Dermatologic Congress. Sixth meeting: New York, 1907.

International Conference for the Study of Cancer. Second meeting: Paris, 1910.

International Surgical Society. Second congress: Brussels, 1908.

International Society of Tropical Medicine.

Non-Alcoholic Congress. Stockholm, 1907; London, 1908.

International Pharmaceutical Congress. Brussels, 1910.

#### *Meteorology*

Paris Meteorological Conference, 1896.

International Meteorological Conference. Innsbruck, 1905.

#### *Orientalism*

International Congress of Orientalists. Ninth meeting: London, 1892; Algiers, 1905.

#### *Philosophy*

International Positivist Congress. Naples, 1908.

International Congress for Philosophy. Third meeting: Heidelberg, 1908.

International Congress of "Free Thinkers." Prague, 1907.

#### *Physiology*

International Congress of Physiologists. Turin, 1901; Heidelberg, 1907; Vienna, 1910 (eighth meeting).

International Association of the Marey Institute. Brussels, 1910.

#### *Political and Social Science*

International Union for the Legal Protection of Workmen. Lugano, 1910.

Interparliamentary Union. Brussels, 1910.

International Congress of Americanists. Mexico, 1910.

Institution of International Law. Brussels, 1910.

International Congress of Comparative History. Paris, 1900.

International Congress of History. Rome, 1903.

#### *Psychology*

International Congress of Experimental Psychology. Paris, 1889; London, 1892; Munich, 1896. The Paris congress is also referred to as the Congress of Physiological Psychology.

#### *Seismology*

International Seismological Association. Strassburg, 1901; The Hague, 1907; Zermatt, 1909.

#### *Zoology*

International Zoological Congress. Paris, Moscow, Leyden; Cambridge, 1898; Berlin, 1901; Berne, 1904; Boston, 1907; Graz, 1910 (eighth meeting).

International Conference on Hybridization and Cross-Breeding. London, 1899.

International Ornithological Congress. Vienna, 1884; Budapest, 1891; Paris, 1900; London, 1905.

International Congress of Entomology. Brussels, 1910.

*Unclassified*

International Association of Academies. Third meeting: Vienna, 1907; fourth meeting: Rome, 1910.

L'Académie Internationale des Sciences, des Arts et Manufactures. Paris, 1860.

International Patent Congress. Vienna, 1873; Paris, 1878.

International American Scientific Congress. Buenos Ayres, 1910.

International Conference on Scientific Literature. Third meeting: London, 1900.

International Association of Leather-Trades Chemists. London, 1897.

Women's International Congress. London, 1899.

International Groups of Esperanto. Brussels, 1910.

International Prison Congress. Eighth congress: Washington, 1910.

CHARLES BASKERVILLE

COLLEGE OF THE CITY OF NEW YORK

*WILLIAM JAMES*

THE following minute on the life and services of Professor William James was placed upon the records of the faculty of Arts and Sciences, of Harvard University, at the meeting of October 18, 1910.

By the death of William James this university loses one who brought it high honor in many lands. As a man of science he left his mark on several departments of knowledge, while as a literary man he charmed all who read his lucid and picturesque pages. In him science and humanism were singularly combined. Learned as he was, he had none of the pedantry of the scholar. His books, besides illuminating their subjects, were creative of character, and through them he became one of the chief spiritual forces of our time.

He was born in New York, on January 11, 1842, of devout and independent parentage. Throughout life his studies were much disturbed by ill health, to which his dauntless spirit refused to bow. But a somewhat irregular education suited well a nature which was always fretted by routine and profited by whatever was unusual, diverse and expressive of individual character. In his youth he attended a Lycée in France and afterwards the

University of Geneva, there gaining an unusual command of French. His German he acquired a few years later at the University of Berlin. In 1862-64 he was in the Lawrence Scientific School; then for four years in the Harvard Medical School, from which, two years later, he received the degree of M.D. He studied with Agassiz in the Cambridge Museum, and accompanied a scientific expedition to Brazil. He worked at painting under William Hunt, with John La Farge as a fellow pupil. His home training gave him power of expression, for in that home brilliant conversation and literary skill were traditional; while philosophy was at the same time set before him, on the one hand by his theological father, and on the other, by his rationalistic friend, Chauncey Wright. He early showed a strong distaste for such idealistic modes of thought as he believed obscured the concrete realities of experience.

The progress of his mind can be traced in the successive topics of his teaching. In 1873 he became an instructor in anatomy at Harvard; but soon, finding greater interest in physiology, he accepted an assistant professorship in that subject, in 1876. For the next three years, in addition to teaching physiology, he offered a course on the theory of evolution in the department of philosophy. In 1880 he abandoned physiology altogether, becoming in that year assistant professor, and in 1885 professor, of philosophy. He now gave himself enthusiastically to psychology, and under his energetic guidance a psychological laboratory was established here. But after the publication of his treatise on psychology, in 1890, his interest in it declined, and he turned more toward the history of philosophy and the theory of knowledge. In 1892 he resigned the directorship of the laboratory, and after 1897 was never willing to offer a psychologic course. Religion and metaphysics claimed him, and his last years were devoted to the elaboration of a comprehensive philosophy in which the portion known as pragmatism has occasioned wide discussion.

While unusually successful as a teacher,