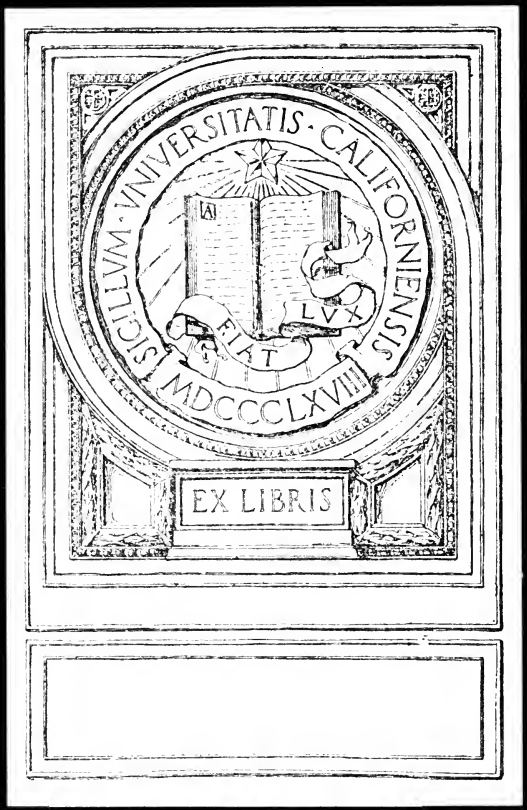
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SECOND

PAN-AMERICAN SCIENTIFIC CONGRESS

TO BE HELD IN WASHINGTON
DECEMBER 27, 1915–JANUARY 8, 1916

PRELIMINARY PROGRAM

DEPARTMENT OF STATE
APRIL 15, 1915

HEADQUARTERS: PAN-AMERICAN UNION
WASHINGTON, D. C.

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INDEX OF SECTIONS.

NOTE.

The Governing Board of the Pan-American Union at its meeting on April 7 signally honored the Second Pan-American Scientific Congress by unanimously passing a resolution authorizing the use of its beautiful building for the offices and sessions of the Congress. The Board also, in response to the request of the President and Secretary of State of the United States, and in recognition of the fact that this Congress is to be a great Pan-American gathering, authorized the Director General of the Pan-American Union to act as Secretary General thereof. Government officials, delegates, savants, educational institutions, scientific societies, and others interested are, therefore, requested to address all communications concerning the Congress to the "Secretary General, Pan-American Scientific Congress, Pan-American Building, Washington, D. C." Cable address, "PAU, Washington, D. C."

Organization officers of the Congress:

JOHN BARRETT, *Secretary General.*

GLEN LEVIN SWIGGETT, *Assistant Secretary.*

PROGRAM

OF THE

SECOND PAN-AMERICAN SCIENTIFIC CONGRESS,

TO BE HELD IN

WASHINGTON, D. C., U. S. A.,

DECEMBER 27, 1915–JANUARY 8, 1916.

ORGANIZATION.

ARTICLE 1. In accordance with the resolutions of the First Pan-American Scientific Congress, held in Santiago, Chile, December 25, 1908, to January 5, 1909, a second Pan-American Scientific Congress will meet in the city of Washington in the month of December, 1915, under the auspices of the Government of the United States.

The Congress will open on Monday, December 27, 1915, and adjourn on Saturday, January 8, 1916.

ART. 2. The organization and procedure of the Second Congress shall be in charge of an Executive Committee, composed of, first, members appointed by the First Congress at Santiago; second, of members elected by the said committee.

The Executive Committee.

WILLIAM PHILLIPS, A. B., *Third Assistant Secretary of State, Chairman ex officio.*

JAMES BROWN SCOTT, J. U. D., *Secretary, Carnegie Endowment for International Peace, Vice Chairman.*

WILLIAM H. WELCH, M. D., LL. D., *President, National Academy of Sciences, Honorary Vice Chairman.*

JOHN BARRETT, LL. D., *Director General, Pan-American Union.*

W. H. BIXBY, *Brigadier General, U. S. A., Retired.*

PHILANDER P. CLAXTON, LL. D., *Commissioner of Education.*

WILLIAM C. GORGAS, M. D., Sc. D., *Surgeon General, U. S. A.*

WILLIAM H. HOLMES, B. S., *Head Curator, Smithsonian Institution.*

HENNEN JENNINGS, C. E., *former President, London Institution Mining and Metallurgy.*

GEORGE M. ROMMEL, B. S., *Chief, Animal Husbandry Division, Bureau of Animal Industry, Department of Agriculture.*

L. S. ROWE, Ph. D., *President, American Academy of Political and Social Science.*

ROBERT S. WOODWARD, Ph. D., *President, Carnegie Institution of Washington.*

Organization Officers:

JOHN BARRETT, LL. D., *Secretary General.*

GLEN LEVIN SWIGGETT, Ph. D., *Assistant Secretary.*

Address:

Pan-American Union, Washington, D. C.

ART. 3. The Executive Committee shall nominate the president and two or more vice presidents of the Congress and shall appoint the secretary general and such assistant secretaries as may be necessary.

The Executive Committee shall appoint interpreters, clerks for the secretary's office, and such other employees as may be necessary.

The Executive Committee shall appoint honorary presidents and vice presidents to be selected from the participating countries.

The secretary general shall be the executive officer of the Executive Committee and shall have charge, in cooperation with the committee, of the preparations and arrangements for the Congress. He shall also conduct correspondence, supervise expenditures, and perform such other duties as may be assigned to him by the Executive Committee.

The assistant secretary, in the absence of the secretary general, shall have authority to perform the duties of the secretary general.

ART. 4. The Executive Committee shall designate such committees as may be necessary.

The Executive Committee shall designate nine of its members to serve as chairmen of the nine main program sections of the Congress. Each member of the Executive Committee so designated shall nominate the members of his section committee and shall select the chairmen for its various subsections. The chairman of each section shall be a member ex officio of each subsection committee.

ART. 5. The duties of the Executive Committee, in cooperation with the secretary general, are:

1. To arrange for the Second Congress and participation by the Government of the United States, the universities, and other scientific, national, and foreign corporations.

2. To take steps to secure the appointment of committees at the capitals of the American States by the participating governments, the duties of which committees shall be to cooperate in the preparations for the Congress; to prepare lists of the persons to be invited to participate in its proceedings; to procure an adequate representation from the several countries, and to suggest such questions as, because of their evident American interest, should be submitted to the Congress.

3. To prepare a list of members of the Congress in conformity with the provisions of Article 9.

ART. 6. After the election of the officers of the Congress, the Executive Committee shall act under their direction, but shall reassume its original functions after the adjournment of the Congress. It shall then have charge of the publication of the proceedings of the Congress.

Sections.

ART. 7. The following are the sections into which the Congress will be divided, alphabetically arranged:

I. Anthropology.
II. Astronomy, Meteorology, and Seismology.
III. Conservation of Natural Resources, Agriculture, Irrigation, and Forestry.
IV. Education.
V. Engineering.
VI. International Law, Public Law, and Jurisprudence.
VII. Mining and Metallurgy, Economic Geology, and Applied Chemistry.
VIII. Public Health and Medical Science.
IX. Transportation, Commerce, Finance, and Taxation.

Section Committees.

ART. 8. The section committees shall hold separately such meetings as they may deem necessary for the determination of the matters submitted to them.

Each section committee may be subdivided into two or more subsection committees when deemed necessary, and two or more subsection committees may become a single committee.

It shall be the duty of each section committee, in cooperation with the secretary general—

I. To invite the preparation of papers on topics deemed of special interest to the Congress; to prepare a list of the papers received, and to present a program for each session of the sections and subsections under its charge.

II. To prepare the register of the members of its section.

III. To receive and classify such statements, studies, and communications as are sent to the section, and to designate the reporting member thereof.

IV. To make a report to the section of the papers that are not to be read by their authors.

V. To organize the section and subsections.

VI. To receive the papers of the respective section and subsections and to prepare them for publication.

Members of the Congress.

ART. 9. The following persons will be members of the Congress:

I. The official delegates of the countries represented.

II. The representatives of the universities, institutes, societies, and scientific bodies of the countries represented.

III. Such persons in the countries participating in the Congress as may be invited by the Executive Committee, with the approval of the countries represented.

ART. 10. All properly accredited members, upon the presentation of credentials, shall receive from the secretary general an appropriate membership card.

ART. 11. All members of the Congress shall be entitled to attend its sessions, to take part in the debates, and to receive a copy of such publications as the Executive Committee may issue.

ART. 12. Americans who are prominent in the field of science may be appointed honorary members of the Second Pan-American Scientific Congress, whenever the Executive Committee deem proper to confer this honor upon them.

WILLIAM PHILLIPS,
Chairman.

RULES OF THE CONGRESS.

I. The sessions of the Congress will extend over a period of thirteen days, from Monday, December 27, 1915, to Saturday, January 8, 1916, at hours to be announced. The sections will meet simultaneously on each day; and the arrangement of the program will be in charge of the chairman and reporting member of each section, in consultation with the secretary general.

II. The time to be allowed for the presentation and discussion of each paper will be determined by the several section committees, after receipt of papers and reports; preference will be given to those subjects upon which the papers submitted are most important or useful to Pan-American countries in general.

III. In view of the great number of papers to be submitted, they should be as concise as possible. It is desirable that each paper shall be typewritten. They may be accompanied by illustrations and tabular matter to clarify and shorten descriptions.

IV. It is suggested that illustrations be limited in number, and be submitted upon sheets not over 10 inches by 22 inches (25 cm. by 56 cm.) including the border, or 9 inches by 21 inches (23 cm. by 53 cm.) inside the border.

V. Each paper should be accompanied by a résumé of not more than 1,500 words, followed by a footnote giving the bibliography of the subject to include references to important original papers and sources of information referred to in the paper.

VI. In view of the desire to take full advantage of the great progress of recent years, it is suggested that the papers submitted have special reference to the trend of recent progress and to the probable development of the immediate future.

VII. Papers descriptive of special works, and largely statements of facts, should be restricted to the particular work under consideration, and should give as much detail as is possible.

VIII. All resolutions presented in plenary session shall immediately be referred to the Executive Committee, which committee shall make report thereon to the Congress.

IX. All resolutions presented to sectional meetings shall first be referred to the subcommittee in charge of the section.

X. The official languages of the Congress will be the Spanish, the Portuguese, the French, and the English.

XI. In order to enable the officers of the Congress to prepare for its labors, it is essential that the authors of papers shall forward their papers to be received by the secretary general not later than November 1, 1915.

PROGRAM

OF THE

SECOND PAN-AMERICAN SCIENTIFIC CONGRESS.

It is the hope of the Executive Committee to give to the Second Pan-American Scientific Congress the character of a series of international conferences. In order to concentrate attention upon those questions which are of greatest interest to all the republics of America, delegates are requested to prepare papers on some aspect of the general topics and questions submitted below.

SECTION I.

Anthropology.

Dr. HOLMES, *Chairman.*

I. Physical Anthropology.

(*a*) Origin of man; his place in the scheme of nature; problems of evolution, migration, geography, chronology.

(*b*) Development of the individual from the embryo through childhood to full maturity; involution of the individual and death.

(*c*) The races, their differentiation, physical characteristics, fertility, physiology; admixtures, tendencies.

(*d*) Eugenics: proposed measures for physical betterment.

(*e*) Pathology; geographical distribution of disease, racial characteristics, effects on progeny and race.

(*f*) Racial position and antiquity of the American aborigines; physical modifications due to changes in social, political, and industrial conditions; results of admixture with other races.

(*g*) The racial elements now entering into the composition of the American peoples as a whole; progress and tendencies of amalgamation; possibilities of intelligent and and effective direction of the processes.

(*h*) Methods of research, record, and display: Anthropometry, instruments.

II. Ethnology. The social and political groups, stocks, tribes, clans, societies, families; languages, habits, customs, arts, industries, religion, esthetics.

III. Archeology. The various lines of research opened up by the study of the tribes are continued indefinitely into the past by the

researches of this branch. The many topics for discussion include those especially which relate to the chronology of the American race, and the evolution of its culture.

Although world anthropology in all its phases may be considered by the Congress with profit, it is assumed that chief interest will center in the American branches of the subject, and especially in its more strictly Pan-American phases. To the latter belong (1) problems of the aboriginal peoples, their history, present status, and possible future; (2) problems relating to the complex of races and nationalities now constituting the Pan-American populations. The present period is witnessing the phenomena of migration, conquest, and race rebuilding on a scale unparalleled in history, and the problems arising with regard to the trend and possible outcome are among the most important that science has to consider.

INTERNATIONAL CONGRESS OF AMERICANISTS.

It has been arranged that the Nineteenth International Congress of Americanists shall meet in Washington during the same week with the Pan-American Scientific Congress, so that joint conferences can be held for the discussion of subjects of common interest to members of the two organizations. It is expected that such joint meetings will be arranged for especially between the Congress of Americanists, which deals largely with anthropology and the anthropology section of the Pan-American Congress. This will be especially advantageous since a large number of students from all parts of America, as well as from the Old World interested in these branches, will thus be brought together on common ground.

The arrangement of the joint programs for the presentation of the papers will be placed in the hands of a joint committee of the two congresses, which committee will arrange for the publication of the same.

Since it is planned that the section of anthropology shall hold its meetings or conferences for the discussion of the problems which it has to consider jointly with the International Congress of Americanists, it is assumed that the program can not be arranged save in its general scope, as indicated above, until the program committees of the two congresses meet. The Americanist Congress concerns itself especially with American problems, and more especially with those which relate to the aboriginal peoples, but the discussions may extend also to history, geography, institutions, government, etc., all of which topics are of particular concern to Pan-America.

SECTION II.

Astronomy, Meteorology, and Seismology.

Dr. WOODWARD, *Chairman.*

A. ASTRONOMY AND GEODESY.

I. Problems of International Interest in Astronomy.

II. Problems of International Interest in Geodesy.

Under these topics will be considered among other questions the following:

1. A new determination of the moon's parallax from simultaneous observations on the same meridian.

2. The measurement of a system of primary triangulation extending from Alaska to Patagonia.

3. The desirability and feasibility of extending a gravimetric survey to cover the American continents.

B. METEOROLOGY AND SEISMOLOGY.

I. *General Meteorology.*—Physics of the atmosphere; general circulation; laboratory methods; position of meteorology among the sciences.

II. *Weather Phenomena.*—Such as general storms, cold waves, thunderstorms, West India hurricanes, hydrometeors, etc. Correlations of weather in widely separated regions.

III. *Weather Forecasting.*—Methods and principles; organization of a telegraphic weather service; distribution of forecasts and warnings; forecasts for special industries, etc.; long-range forecasts; classification of weather types.

IV. *Agricultural Meteorology.*—Relations of weather and climate; applications of meteorological statistics to agriculture and other rural industries, including animal husbandry.

V. *Climatology and Climatography.*—Methods and principles of climatology; climatic fluctuations; climatography of particular regions or places.

VI. *Aerology.*—Investigations of the free air by means of kites and balloons, observations of meteors, etc. Results and application.

VII. *Solar and Terrestrial Radiation.*—Methods of observation, results, and application.

VIII. *River Hydraulics.*—River stage prediction and flood warnings; factors determining the regimen of rivers.

IX. *Instruments and Units of Measurement in Meteorology and Seismology.*

X. *Meteorological and Seismological Organizations in the Pan-American Countries.*

It is especially desired that every Pan-American country submit written reports on the present condition, needs and prospects of meteorological and seismological work in its own territory. For the sake of uniformity, it is suggested that each report contain a list of all meteorological and seismological stations *now actually in operation* within the several countries, including unofficial stations, together with their geographical coordinates and their altitudes above sea level; also a classification of these stations, as far as may be practicable, with respect to the scope of their observations. The reports should include information as to the places where daily weather maps are published in each country; the extent and character of the work carried on in weather forecasting, the issue of storm warnings, and river-stage prediction; and the titles of all publications in which the results of meteorological and seismological observations currently appear. Lastly, they should include a list of the longer meteorological and seismological records known to exist in each country, whether in printed form or in manuscript.

It is expected that this series of reports will furnish the basis for a general discussion on the subject of meteorological and seismological organization in the Americas, especially with a view to securing more uniform methods and closer cooperation.

SECTION III.

Conservation of Natural Resources, Agriculture, Irrigation, and Forestry.

Mr. Rommel, *Chairman.*

I. Conservation of Mineral Resources.
II. Conservation of Forests.
III. Conservation of Water for Power.
IV. Irrigation.
V. Conservation of the Animal Industry.
VI. Conservation of the Plant Industry.
VII. Marketing and Distribution of Agricultural Products.

I. *Conservation of Mineral Resources.*—Under this topic the section will discuss in its broadest phases the conservation of the mineral resources of the American Continents for present needs as well as for future generations. It is especially desirable to know what steps are being taken in the different American countries to avoid waste in the utilization of natural resources. This topic should cover the conservation and utilization for the best interests of mankind of coal, petroleum, asphalt, potash, nitrates, salt, sulphur, and of the ores of iron, copper, lead, zinc, tin, nickel, cobalt, vanadium, phosphorus, gold, silver, platinum, and radium and other mineral products used in manufacture, commerce, or agriculture.

II. *Conservation of Forests.*—The subject of forest conservation is attracting attention in all American countries. In some, as in the United States, it has become extremely important and large government projects have been inaugurated to conserve the supply of available timber and to increase the forest areas by artificial plantings. The question naturally occurs as to the extent of such a condition generally throughout the Western Hemisphere. The proper utilization of the supply of mahogany for example, or the utilization of the rubber forests to obtain a maximum output and to remove possible danger of actual extermination of the species, are topics which will readily occur to persons interested. The cooperation of private interests with those of the public, and the interest in efficient lumbering and utilization of by-products, are also important subjects. Under this topic should be included all trees useful for the production of lumber, rubber, tanning materials, dyestuffs, gums, drugs, and other products used in manufacture, commerce, or agriculture.

There should be included in the consideration of this topic all useful trees which comprise the forest area and are not therefore strictly speaking cultivated crops, although some of them may have been artificially planted. Plantations of fruit, nuts, coffee, cacao, rubber trees, etc., which are cultivated as long as the trees are productive, are, strictly speaking, cultivated crops and should be considered under the topic, *The Conservation of the Plant Industry.*

III. *The Conservation of Water for Power.*—Under this subject it is desired to consider all conservation and utilization of water power with a view to the best interests of mankind. This topic should include the utilization of water power for manufacturing, for hydroelectric purposes and for electrochemistry. The utilization for power of water which is a by-product of the operation of mines, canals, and drainage systems should be also considered.

The constructional and other engineering features of water power are to be treated under Section V.

IV. *Irrigation.*—This topic should include the conservation and proper use of water for irrigation, the use of irrigation waters as sources of power, laws for the control, regulation, and promotion of irrigation development and the financing of irrigation projects. The question of irrigation development affects the agriculture of an enormous area in the Western Hemisphere. Different countries have attacked this problem in different ways, and it is probable that in none of them has the irrigation development reached its maximum. Not only are there large quantities of surplus waters unutilized for irrigating purposes, but subterranean waters are also available to a great extent, either as artesian water or by pumping.

The constructional and other engineering features of irrigation are to be treated under Section V.

V. *The Conservation of the Animal Industry.*—The animal industry is possibly the leading agricultural industry of the Western Hemisphere and on its conservation largely depends the permanency of agriculture. This topic should be developed to cover the animal industry in all its phases, including horses, cattle, sheep, goats, swine, llamas, alpacas, poultry, and other animals and birds useful to mankind as sources of motive power, food, clothing, skins, feathers, fertilizers, fats, oils, or other products used in manufacture, commerce, or agriculture.

The conservation of the animal industry by improved methods of production, by the domestication of native species not now domesticated, and by the control of predatory animals and the control and eradication of animal diseases, insects, pests, and parasites, should be treated.

VI. *The Conservation of the Plant Industry.*—The plant industry of the hemisphere supplies a large proportion of the world's cereals and other plant products. The wheat, cotton, sugar, coffee, and fruit reach tremendous totals, and the success of the year's crop of these staples in the American countries is of vital importance to all mankind.

Under this topic the section will discuss the plant industry in all its phases, including cereals, forage crops, fruits, nuts, fiber plants, sugar crops, rubber, coffee, cacao, and other cultivated plants, shrubs, and trees useful to mankind as sources of food, clothing, dyestuffs, tanning materials, fats, oils, perfumes, drugs, fertilizers, and other products used in manufacture, commerce, or agriculture.

It is suggested that methods be discussed for the conservation of the plant industry by the use of improved methods of production, by the use of native plants not now cultivated and by the control of insects, pests, and diseases.

VII. *Marketing and Distribution of Agricultural Products.*—A phase of conservation of great importance is the reduction of waste in the marketing and distribution of agricultural products. The subject does not necessarily mean the elimination of the middleman in this process. Indeed the middleman can well be regarded as a useful member of society. There is much evidence, however, that much of our cost of marketing and distributing agricultural products is unnecessary and can be materially reduced.

The discussion of this topic should be broadly developed to show the methods of marketing of leading agricultural products of the countries represented in the Congress, tracing the various steps in the process from the time the producer sells his product until the consumer is finally reached. The utilization of selling associations of producers; of systems of grading, classifying, standardization and warehousing of products, controlled by producers or by government; the question of loans to facilitate the handling of crops and other agricultural products; of the best methods of handling these loans; are topics of the highest importance to every agricultural country.

SECTION IV.

Education.

Dr. Claxton, *Chairman.*

I. Public Education in a Democracy.
   (*a*) Elementary Education.
   (*b*) Secondary (or intermediate) Education.
   (*c*) University Education.
   (*d*) Education of Women.

II. International Education.
   (*a*) Exchange of Professors and Students between countries.

III. Technical Education.
   (*a*) Engineering.
   (*b*) Medical.
   (*c*) Agricultural.
   (*d*) Industrial.
   (*e*) Commercial.

I. Public Education in a Democracy.

The countries associated in this Congress have one fundamental characteristic in common—all maintain a democratic (or republican) form of government. Despite differences of climate, racial constitution, industrial conditions, and wealth, all have the same problem which lies at the heart of the national life. This is the problem of the development of an intelligent citizenry trained to appreciate and to preserve republican institutions. Without appropriate forms of public education constantly readjusted to a changing physical and economic environment, and to industrial and social conditions, such a citizenry can hardly be secured. All agree that successful democracy rests on education, but the implications and applications of the doctrine are open to discussion.

(*a*) *Elementary education.*—The countries associated in this Congress have established a certain measure of public elementary education. A corollary to public elementary education is its support by public funds. This raises the further questions of State and local taxation for educational purposes, the ratio of school taxation to general taxation, and other similar and related questions.

Public education supported by public funds can not succeed in giving the children of the people the elements of knowledge unless the children attend school. The laws of the different countries and of the several States of some of these countries with respect to com-

pulsory attendance are not uniform, but the feeling grows that some form of compulsory attendance laws are necessary. The experience of one country in this regard can not fail to be of interest to all others.

As the people's schools assume wider functions and are relied upon more and more to educate for citizenship and for vocations the importance of intelligent and adequate supervision to the end that time and energy may be used to better advantage becomes more evident. In some of the countries participating in this Congress, and especially in the United States, the means of providing this supervision has become a problem of great importance and is much discussed.

1. To what extent should elementary education be supported by local taxation and to what extent by State taxation? What should be the determining factors in the distribution of support?

2. What are the essential elements of an effective compulsory school attendance law?

3. What factors determine the extent and scope of common elementary education?

4. What place should industrial training have in elementary education?

5. What conditions should determine the curriculum of the elementary schools of any community?

6. To what extent should the curriculum be determined by State authorities and to what extent by local authorities?

7. How should the administration of elementary schools be divided between State and local authorities?

8. Should the local unit of administration be the single school district or some larger territory?

9. What should be the minimum standard of preparation for teachers of elementary schools in the city? Of elementary schools in the country? What are the most effective agencies for the preparation of elementary teachers for schools of each kind?

(*b*) *Secondary education.*—The idea that secondary education may rightly be included in the scheme of tax-supported public education is relatively new. It has been adopted by only a portion of the countries to participate in this Congress. The advocates of tax-supported secondary education believe that democracy is impossible without the extention of opportunities for advanced training to all who are qualified to take advantage of them. Among the advocates of public secondary education there is, however, a difference of opinion concerning the range and extent of education to be provided at public expense. Is vocational education a proper function of

the secondary school, or should its functions be limited to general and cultural education and preparation for citizenship? To what proportion of the youth of a country is it desirable to give secondary education? That the best results may be obtained from the funds provided for the support of the schools, and that the time of the children may be used to the best advantage, it is necessary that teachers shall be prepared for the work. The best methods of educating and training teachers both for the elementary schools and for the secondary schools is still a question for careful consideration and discussion.

1. How nearly universal should high school education be in a democracy?

2. What should be the primary and what the secondary purpose of high school education? To what extent should courses of study in the high school be determined by the requirements for admission to college, and to what extent by the demands of industrial and civic life?

3. What place should vocational training have in high school education?

4. What should be the standards of preparation for teachers of high schools? What are the most effective agencies for the preparation of high school teachers?

(*c*) *University education.*—The typical university of the countries of Central and South America is a State institution. The university in the United States may be under either State or private control. In the eastern part of the United States in the older Commonwealths, the private university is the prevailing type; in the more recently settled West and Middle West the stronger institutions of higher learning are generally State universities. The United States, being a federation of independent Commonwealths, has no national university, as it has no national system of education. State education is under the control of the constituent States. The organization of the State university in the United States and its relation to the life of the State that supports it are matters of great interest to students of higher education. Probably in no other country has such direct correlation between the university and the activities of the State been achieved.

Both private and State universities in the United States have developed types of management not known to the universities of other countries. Their activities are closely coordinated by means of a staff of administrative officers, of whom the most prominent are the president, the deans of the various schools or departments, and the registrar. The business affairs are to a large degree separated from

the educational concerns of the university and handled by a trained staff of business officers. The office of university president in the United States is a position of great power and responsibility. The president is the director, the superintendent, and the educational leader of the institution; and likewise the focus of its life. In general the compactness of organization of the typical university in the United States, the *esprit de corps* which prevails among its professors and students, are special elements of strength. In certain of the newer States of the United States the university has in a sense become the chief servant of the people in all their more important interests. Not only is university education free to all who are able to avail themselves of it, but the university carries the results of its scientific investigations directly to the farmers in the fields, and the factory workers in the shops. The legislative and economic problems of the State are made the first concern of the trained staff of the university. Whether it is the proper function of the university to direct its attention thus closely to the practical problems of the day and to take so active a part in the social and political life of the community, or whether it should devote itself more exclusively to the pursuits of pure science without reference to its direct and contemporary bearing, is a matter for discussion.

1. Should universities and colleges supported by public funds be controlled by independent and autonomous powers or should they be controlled directly by central State authority?

(*d*) *The education of women.*—The propriety of extending opportunities for all types of education, vocational, professional, and purely cultural, to women on the same terms as to men, is now generally admitted in American countries. Whether all the education of women should be in separate institutions, or whether coeducation should generally prevail, is nowhere settled. In those countries where coeducation has developed there is no positive agreement as to the institutions which should be conducted under this policy. Whether coeducation should prevail in the elementary and higher schools and not in the secondary schools, or whether it should be in force in the elementary and secondary and not in the higher institutions, has not yet been determined to the satisfaction of all educators even in those States which are committed to coeducation. The policy of segregation in higher institutions has been tested in various ways in many of the countries represented in this Congress. It is not the purpose of this memorandum to determine the question. The experiences of each country should furnish valuable data bearing upon it.

Among the new subjects which have been developed in recent

years and now take rank as school and university studies, are domestic science, home economics, and the household arts. The oldest profession of woman is the profession of home maker. It doubtless will be women's principal calling as long as homes exist. Home economics and domestic science in the schools are the substitution of scientific methods for the apprenticeship method in education for home making, and has been made necessary by the changes in home life brought about by modern social conditions. Domestic science and arts are new as subjects for school instruction. The development both of content and method is, for the most part, still to come.

1. To what extent is coeducation desirable in elementary schools, high schools, colleges, and universities?

2. In what essential features should the education of women differ from the education of men?

3. What place should the science and art of home making have in the education of women?

II. International Education.

(*a*) *Exchange of professors and students between the universities of the United States and Central and South America.*—The mutual profit to be derived by the countries associated in this Congress from a better knowledge by each of the language, history, and institutions of the others can not be over emphasized. The interchange of ideas and culture between Central and South America and the United States will lead to a better and more sympathetic mutual understanding. Between the United States and the countries of Europe there has been a constantly increasing interchange of professors and university students. American students visiting the universities of France and Germany have brought back a more intimate knowledge of the peoples, institutions and ideals of these countries. American professors in their universities have helped to give them a better understanding of American institutions, ideals, and life. Distinguished European scholars at universities in the United States have enabled the people of this country to understand various phases of European life in a way and to a degree otherwise impossible. Up to the present very little has been done to establish similar relations between the United States and the countries of Central and South America. A few exchanges, however, already have been effected and there are tentative plans for others. This section of the Congress may profitably discuss the general question of international academic relations, the ways and means for pro-

moting the exchange of professors, the migration of students from one country to another, and the best arrangements for the exchange of professors and the establishment of centers of information through which any country of the Americas may obtain reliable information about the educational institutions, ideals, and policies of the others.

1. To what extent is an exchange of students and professors between American republics desirable? What is the most effective basis for a system of exchange?

2. What plans should be adopted in order to secure mutual recognition of technical and professional degrees by American republics?

III. Technical Education.

(*a*) *Engineering education.*—The relative importance of a general training in engineering branches and of close specialization in a single branch of engineering is a matter of much importance which should be discussed by the Congress.

1. To what extent may college courses in engineering be profitably supplemented by practical work in the shop? To what extent may laboratory work in engineering be replaced through cooperation with industrial plants?

(*b*) *Medical education.*—It is believed that State control of higher education is in general more effective in Central and South America than in the United States. This is shown particularly in the provisions in force in the various countries represented in this Congress for the training and licensing of medical practitioners. The high standing of the medical schools of Central and South America is generally recognized. This is doubtless due in large measure to the fact that in these countries the State has assumed the responsibility for medical education and training and has thus enabled the faculties of medical schools to establish high standards of scholarship, and enforce stringent regulations for the practice of medicine. The faculty of medicine is an administrative body as well as a teaching staff. It tests the scholarly attainments of the students to determine their progress in the course, and conducts the examinations that entitle the student to the privilege of practicing his profession. It is also empowered by the State to make regulations governing the practice of medicine throughout the nation. Thus to a certain extent it directs the practitioner. Compared with this excellent and effective means of securing and maintaining professional standards, the methods of training and licensing physicians in the United States seem to some to be crude and badly organized.

The Commonwealths of the United States have not yet attempted to control medical education, consequently there is much disparity in the standards of medical schools. The authority of the State is limited to the issuance of the license to practice. Regulations governing such licenses are various and in many States very lax. The question of whether the faculty of the medical school should have supervision of medical education and practice throughout the State is one involving not only the efficiency of medical instruction, but the proper scope of the State's authority over the concerns of the individual. It is both a scientific and a political question such as may come before a Congress composed of representatives of different countries and different sciences.

1. What preparation should be required for admission to medical schools? What should be the minimum requirements for graduation? What portion of the faculty of a medical school should be required to give all their time to teaching and investigation? What instruction may best be given by physicians engaged in medical practice?

2. Should the university or the State license physicians and regulate medical practice?

(*c*) *Agricultural education.*—Every country is now alive to the importance of formal scientific education and training in agriculture. The more lavishly the national resources have been used, the more pressing has become the necessity for scientific agricultural education, not only in special colleges and schools of agriculture, but as a part of general secondary education. In connection with the last-mentioned phase of education, agriculture takes on new importance. It is not merely a means of preserving the food supply of the nation, but it humanizes and vitalizes the life of people engaged in agriculture.

In the United States the scientific study of agriculture has been put upon a sound footing, largely through the action of the Federal Government. The foundation of colleges of agriculture partly supported by Federal grants was the first step. The second, of still greater influence in the development of the science, was the establishment of experiment stations at Government expense. These in connection with the State-supported colleges of agriculture are centers of stimulus and progress. This policy of the Government of the United States and the policies of the countries of Central and South America will be interesting topics for discussion by the Congress.

1. What preparation should be required for admission in State and national colleges of agriculture? To what extent should the

courses of study in the agricultural college be theoretic and general, and to what extent practical and specific? To what extent should the curriculum of any such college be determined by local conditions?

(*d*) *Industrial education.*—The countries of the Western Hemisphere have been slower than those of Europe to appreciate the necessity for industrial training. The United States is fast becoming an industrial democracy. The same trend of evolution has already appeared in certain countries of Central and South America and with the increase in population will soon appear in all. The educational philosophy of the democracies of the New World demands training for the occupations followed by the majority of the people. Moreover, national prosperity depends upon such training. Without it, it is impossible to meet the commercial competition of the nations of Europe, where this type of training has been developed to a high degree of efficiency. It is, however, as yet undecided to what extent opportunities for industrial training should be included in systems of public education. If secondary education is to be provided generally at public expense, shall it include industrial training? Shall training for the simpler forms of trades be introduced into the elementary schools? The cooperation of public schools and employers of labor is fundamental for the creation of practical schemes of industrial education. In the United States the latest phase of the movement for industrial education has led to an effort to fit the individual to the type of industry best suited to his tastes and talents. Vocational guidance, by wise and sympathetic persons who are acquainted both with industry and with education, is claimed to be the logical corollary of industrial education in a democratic state.

1. What should be the place of industrial education in the school system of the American republics? Should it be supported by public taxation? Should it be considered as a function of the public school system? Should it be given in a separate system under separate control? How and to what extent may industrial schools cooperate with employers of labor?

(*e*) *Commercial education.*—Central and South America have done more to foster commercial education than has the United States. The commercial schools established partly to rescue South America from the foreign commercial invasion have raised the social position of commerce and stimulated initiative. The United States has as yet taken comparatively little interest in commercial education. Although there has been training under private auspices for commercial careers for nearly a century, the public recognition of commercial education has had to wait until the advocates of indus-

trial training had proved the wisdom of vocational schools. The steadily increasing numbers of graduates of schools and colleges entering commercial pursuits have brought home to educators and laymen alike the necessity of making provisions for this branch of vocational education. Of particular interest to the countries associated in this conference is the type of commercial education which will fit students to develop the commercial relations between the United States and the countries of Central and South America. All signs point to an unprecedented expansion of commercial relations between these countries, and greater approximation of their commercial interests. This will involve a more intimate common knowledge of commercial, industrial, and social ideals and conditions, as well as of geography, history, and language. This important topic is worthy of the especial attention of the Pan-American Scientific Congress.

1. To what extent should commercial education be included in the system of public education? What should be the character of commercial education in the high school? What should be the character of commercial education in the college and university?

SECTION V.

Engineering.

Gen. Bixby, *Chairman.*

A. Transportation Routes by Land and Water.

I. *Railways and Tramways.*

(*a*) Location and Development of Mountain Railroad Transportation Routes.

(*b*) Desirability and practicability of establishing a uniform railroad gauge in Pan-America, and especially in Central and South America.

II. *Highway and Street Construction and Maintenance.*

III. *Water Transportation.*

(*a*) Merchant Marine.

(*b*) River Improvement and Transportation.

(*c*) Canal Construction and Transportation.

(*d*) Bridges, fixed and movable, best type for Pan-America.

(*e*) Port Operations (including construction of piers and quays).

(*f*) Seacoast Shore Protection.

B. Electrical Engineering.

I. Generation, Transmission and Distribution of Electrical Energy.

II. Electricity as Motive Power for Transportation Lines.

III. General Application in Lighting, Industry, Heating, and Domestic Use.

IV. Electro-Chemistry (not to include electro-metallurgy).

V. Electrical Communication, Telephony, Telegraphy, and Signaling.

VI. Codes and Standards.

C. Irrigation and Drainage.

I. Reservoirs.

II. Conduits and Drains.

D. Sanitary Engineering.

I. Sewers.

II. Disposal of Sewage and Garbage.

III. Street Cleaning.

E. Municipal Water Supply.

F. Mechanical Engineering.

G. Nomenclature.

Under the above topics, special attention should be given to the following:

A. II. *Highway and Street Construction.*—Best methods of con-

struction and maintenance as shown by experience to meet various traffic conditions and especially to withstand the wear and tear by motors used for the transportation of passengers and goods over the highways and streets of the various countries.

A. III. *Best Model of Construction for shallow draft boats and barges for general transportation purposes.*—For the present and for many years to come the inland portions of the Pan-American States, in reaching each other, must depend largely upon a mixed transportation by shallow-draft boats, and ocean boats, in addition to railway transportation within each of the countries connected. Under such circumstances it is extremely desirable to affect transfer from one transportation line to the adjoining transportation line at the least possible cost. Such transfer operations may be treated incidentally under the head of "Waterways" (A. III.); but the full treatment of such trans-shipment should be submitted under the head of "Port Operations" (A. III (*e*)).

III (*d*). *Fixed and Movable Bridges for all uses.*—Best general types for the various conditions found in Pan-America.

III (*e*). *Hydraulic Works.*—The type of *construction* best adapted for *piers and quays* when the rivers along which such constructions are to be made are of great depth and swift current.

(NOTE.—This question was taken up originally by the First Congress but was referred by that Congress to the Second Congress, which is now in preparation.)

The Allowable Pressures on Deep Foundations of bridge piers, and quay walls of ports and high buildings, and retaining walls. A summary of experience in each country to be analyzed and deductive conclusions to be presented by the general reporter.

Recent Actually Constructed Harbor and Port Works.—On fluvial and tidal rivers, mouths of rivers, on lakes and estuaries, and on steep sea slopes and exposed shores.

Briefly summarized history of the employment and behavior of concrete and reinforced concrete in fresh and saline waters and under the servitudes of waves in *exposed locations.*

In addition to the above principal questions, it is desirable to receive papers on the more general subject of harbors and docks, including graving and floating docks, lighthouses, beacons, illuminating buoys, submarine signaling, and equipment of ports, also dredging and dredges and contracting and regulating works on the bars at the mouths of fluvial and tidal rivers; and on the best materials and methods of harbor and port constructions.

III (*f*). *Works to Protect Sandy Coasts Against the Encroachments of the Sea.*

B. Electrical Engineering.

B. I. Prime movers employed in *generation*, whether from *water power* or *steam*. If from water power, give watershed data, run off, heads employed, sizes and types of wheels, types of governors, etc., descriptions of dams, flumes, headgates, sizes of generators, voltage and frequency, station apparatus, transformers, etc. If from steam, state what fuel used and description of boiler plant with special reference to oil as fuel supply.

Transmission and distribution lines should cover type of structures, kind and size of conductors, spacing between supports, voltage employed, types of insulators, switching apparatus, lightning protection, etc.

Statements of labor, material, and of overhead costs are especially desirable.

B. II. Adaptation of electrical energy for *electrification of* existing or proposed steam *railway lines*, or lines designed for interurban freight and passenger service. The papers should consider both direct and alternating current systems, and the latter should include questions of single or multiphase generation and distribution, voltage and frequency, trolley and third-rail contacts; electric locomotive, types, sizes, etc.

Statements of labor, material, and overhead costs are especially desirable.

B. III. *Application to industrial and manufacturing development* as prime mover in factories or enterprises requiring power.

The use of electricity for light is subordinate to the larger and more important use for power in Central and South America, where coal is scarce and where oil and water power are abundant. It would be well to cite some striking industrial application of power in these countries and to bring out the possibilities of refrigeration in view of present knowledge and experience.

Statements of labor, material, and overhead costs are especially desirable.

B. IV. *Utilization of electric power in chemical reactions*, facilitating many of the most difficult and costly chemical methods, or supplanting them by quick, simple, and direct methods which have in some cases developed, and may expect to further develop, new reactions and materials not at present manufactured. This large and important new industrial group of electrochemical industries includes such enterprises as the fixation of atmospheric nitrogen, electrolysis of water, electrolysis of salt into other sodium salts, such as caustic soda, soda ash or carbonate, chlorine bleaching material, alkalies, also the calcium carbide industry; the making of artificial graphite, etc.

Description of any of these industries should include methods employed, description of apparatus, consumption of electrical energy, etc.

Statements of labor, material, and overhead costs are especially desirable.

B. V. *Electrical Communication.*—This should include latest practice in telephony and telegraphy by wire lines and wireless; description of radio stations in Pan-America, including engineering details, wave lengths, submarine cable practice, and signaling, etc.

Statements of labor, material, and overhead costs are especially desirable.

B. VI. *Electrical Codes and Standards.*—This topic brings out the desirability of uniform codes and standards of measurements, nomenclature, and practice, concerning which the North American Engineering Societies are approaching complete agreement.

C. *The Laws and Regulations Regarding the Use of Water* in all Pan-American countries which present papers on the subject of irrigation and hydroelectric powers. The present status of legislation of the water rights should be given.

(NOTE.—The above question was originally brought up at the First Congress, and was by it postponed to the Second Congress, now under preparation.)

As in many cases, it is possible and advantageous to combine electric power with irrigation works, it will be allowable to combine in a single paper the treatment of such combined operations in general. If, however, the use of a reservoir or dam is restricted to irrigation alone, the paper should be presented under the head of "Irrigation," (C.). The unused water powers of North and South America constitute one of the most valuable assets of Pan-American countries. In many cases the development of the hydroelectric power is restricted by provisions of general legislation; and consequently such legislation is of vital interest to all Pan-American countries. Compilations of water power construction laws of any single country will therefore be most valuable to other Pan-American countries; and so far as such legislation has been compiled and digested, a brief statement or summary of the same will constitute a valuable paper for the Congress.

C. *Irrigation Systems in Pan-American Countries* in the course of construction and under consideration.

(NOTE.—The above question was taken up originally by the First Congress, and was by it specially referred to the Second Congress now in progress.)

Under this head the papers should include, where practicable, illustrations of works, with details, materials of construction, cross sections of canals, plans of dams, reservoirs, gates, locks for navigations, if any; spillways (waste weirs), methods of measurements of water, layout of systems of ditches, and the drainage. When there are hydroelectric powers either in connection with irrigation and navigation canals or by themselves, the layout and construction of powerhouses, turbines, and dynamos, transformers, etc., should be given; also descriptions of transmission lines, with the voltages employed, length of lines, and the purposes for which the current is used, should be fully stated. An interesting and useful description would be that relating to the systems where irrigation, navigation, and hydroelectric powers are combined. The discussion of irrigation features of irrigation systems, under the head of C. in the engineering section, should be limited to matters of construction and operation, since the other features of the subject are to be treated specially under the section on "Conservation of Natural Resources," and under subsections B. and B. III above.

D.–E. *Sanitary Engineering Works, and Municipal and Rural Water Supply, and their Operations*, best adapted to the conditions existing in various cities and towns and rural districts.

F. *Mechanical Engineering.*

G. *Nomenclature.*—Compilation of native engineering terms and idioms, with their Spanish, Portuguese, French, and English equivalents.

(Note.—The above subject was brought up originally at the First Congress, and was referred by that Congress to the Second Congress now under preparation.) It is not expected that any complete compilation of the engineering terms of the various countries can be prepared in the brief period now remaining before the meeting of the Second Congress; but partial compilations, so far as they are available, are extremely desirable. The subject will probably be referred by the Second Congress to the Third Congress, and perhaps to following Congresses. The matter is one in which even partial work, if submitted in such shape as to allow of publication, will be exceedingly valuable to all countries concerned.

While the above principal questions cover those which are considered of the most vital present interest to Pan-American countries, it is hoped that the papers will not be restricted entirely to such principal questions. Wherever in any country some of the subjects above named have proved to be of special importance to that particular country, and the engineering features of the same have been developed to an extent to attract special attention, a special paper on the subject will be gladly received by the Congress.

SECTION VI.

International Law, Public Law, and Jurisprudence.

Dr. SCOTT, *Chairman.*

I. The relation of international law to national law in American countries.

II. The study of international law in American countries and the means by which it may be made more effective.

III. How can the people of the American countries best be impressed with the duties and responsibilities of the State in international law?

IV. Are there specific American problems of international law?

V. The attitude of American countries toward international arbitration and the peaceful settlement of international disputes.

VI. Should international law be codified? And if so, should it be done through governmental agencies or by private scientific societies?

VII. Criminal law and procedure, with special reference to the scope and limits of jury trials.

VIII. Judicial organization, with special reference to the appointment or election of judges; the organization and functions of the minor judiciary.

IX. The relation of the judiciary and the legislature.

X. Election systems and election methods.

XI. Presidential and parliamentary government on the American Continent.

I. *The relation of international law to national law in American countries.*—Consideration of the rules of conduct applied in the relations between nations to determine whether they are regarded in American countries merely as rules of positive morality, or as a system of international law in the sense in which the term "law" is used to define the rules of conduct within the nation, and the extent to which the principles of international law, if regarded as binding the State in its relations with nations, are regarded as binding and actually applied by it in the administration of its domestic law.

II. *The study of international law in American countries and the means by which it may be made more effective.*—Modern intercourse between States and their citizens and subjects is so important, extensive, and diversified that the conduct of international affairs, upon which so often depends the peace of nations, requires a training not heretofore adequately afforded by the usual courses in educa-

tional institutions; and in democracies, where the people control the actions of the government and choose the authorities responsible for its international conduct, it is becoming increasingly essential that the principles which govern that conduct become more generally known, and that ample facilities be provided for effectively acquiring a knowledge of them. Under this heading it is therefore proposed to consider the means for increasing the facilities for the study of international law and for making its teaching more effective.

A conference on the Teaching of International Law and Related Subjects was held in the city of Washington, April 23–25, 1914, under the auspices of the American Society of International Law. A copy of the proceedings of this conference is enclosed, showing the views of leading publicists and teachers in the United States as to the means which may be taken to render instruction in institutions of learning more effective.

III. *How can the people of the American countries best be impressed with the duties and responsibilities of the State in international law?*—Closely allied with the preceding topic is the problem of impressing upon the people, responsible in democracies for the conduct of government, with a deeper realization of the obligations and duties which are concomitants of the possession of such responsibility. This topic is intended to afford opportunity to consider the means of educating the people and creating a greater interest in the international responsibilities of the State, so that the intelligent direction of foreign intercourse through the chosen channels may have the support of an enlightened constituency.

IV. *Are there specific American problems of international law?*—This topic, stated interrogatively, is not intended to suggest that there is a special international law for the new world, separate and distinct from the international law universally applied, but to discover if there are questions arising between nations in America not covered either adequately, or at all, by the system of international law universally applied, and if so, to discuss such questions and develop the principles by which they should be settled.

V. *The attitude of American countries toward international arbitration and the peaceful settlement of international disputes.*—This section involves consideration of the broad subject of the peaceful as distinguished from the forcible settlement of international disputes. The treatment need not be confined to an historical statement of what the attitude of America has been as shown by actual practice, but may include a discussion of the views of publicists and proposals which have been advanced from time to time to reduce or eliminate the use of force between the nations of America. The words "peace-

ful settlement" include not only the use of arbitration, but also of good offices, mediation, commissions of inquiry, international judicial tribunals, and any other means for adjusting international controversies by reason rather than by force.

VI. *Should international law be codified? And if so, should it be done through governmental agencies or by private scientific societies?*—This topic brings up the question as to whether an attempt should be made to reduce international law to a systematic whole and put it in the form of a code, or regard it as common law to be crystallized by the usages and practices of nations. If the former method is advocated, there should be noted the divergence of opinion as to whether international law should be codified by the governments in conference, by the issuance of separate governmental codifications, or through the work of scientific societies, and the advantages and disadvantages of each should be pointed out.

VII. *Criminal law and procedure, with special reference to the scope and limits of jury trials.*—The several theories for the punishment of criminals, namely as a punishment for crime, as a warning to others, or both, will be discussed, and the effect of each on the nature and content of the law pointed out. The topic will also include general observations on the principal differences between the criminal procedure of States following the civil law, and those following the common law, with especial reference to the proper functions of the jury.

VIII. *Judicial organization, with special reference to the appointment or election of judges; the organization and functions of the minor judiciary.*—In addition to general observations on the judicial organization of the different States, this topic will include a discussion of the reasons for or against the selection of judges, and other judicial officials, by appointment of the executive authority and by election, and for or against their tenure of office for life, and for a term of years.

IX. *The relation of the judiciary and the legislature.*—The particular object of this topic is to provide a discussion, in the light of the experience and practice of the different States, concerning the effect upon the right of the legislative branch to enact the laws, of the check which the judiciary holds over legislative acts by virtue of the power of interpreting and construing them according to the Constitution.

X. *Election systems and election methods.*—A full and free exchange is expected under this topic of views formed as the result of the liberal experience of the American peoples with the election system, upon its operation generally, direct and indirect elections,

and combinations of the elective and appointive systems in the selection of principal and subordinate officials.

XI. *Presidential and parliamentary government on the American Continent.*—This topic is not meant to open up a general discussion of the functions of the executive and legislative branches commonly adopted by the American peoples in their forms of government, but to consider the means for remedying what is sometimes regarded as a defect in the system, namely, a lack of cooperation between these two branches. This cooperation is usually provided for by giving the legislature a voice in the appointment of officials and vesting the veto power in the executive as a check on legislation. Specifically there may be considered the suggestion that more intimate cooperation would be obtained by providing that the executive's principal official advisers, namely, the members of his cabinet, be allowed and required to appear before the legislative branch to explain and justify their policies, and thus make them more directly responsible to the people through their chosen representatives.

Pan-American Institute of International Law.

It is hoped that the American Institute of International Law, which is composed of representatives of the different national societies in the Pan-American countries, may be formally inaugurated and hold its first session in Washington, under the auspices of the Second Pan-American Scientific Congress.

National societies have been formed in Brazil, Chile, Mexico, Nicaragua, Peru, and Uruguay, and are in process of formation in others. It is believed that in this way international law, consisting not merely of the rights but of the duties of nations, will be brought home to the peoples of the different countries through the national societies composed of persons interested in the subject, versed in its principles, and competent to expound and to popularize them.

The Institute, composed of five publicists from each American country, recommended by the national societies, will, it is hoped, do for international law in the Americas what the older Institute of International Law has done for international law in general, and the scientific cooperation of American publicists will not only advance the cause of international law and base the actions of governments upon its principles, but will strengthen the bonds of sympathy which exist between and among the American Republics.

The formation of these societies in all of the countries of Central and South America will materially aid in this educational process, and any encouragement or cooperation which the Governments of the American Republics can extend will give the movement an official impetus.

SECTION VII.

Mining, Metallurgy, Economic Geology, and Applied Chemistry.

Mr. JENNINGS, *Chairman.*

A. MINING AND METALLURGY.

I. Mining laws and regulations, and accident statistics.

(*a*) *Codification* of mining laws, with the purpose of assembling: (1) the mining statutes of each country with amendments to date; (2) State laws and regulations; and (3) the legal interpretation of these laws, including both legal definitions of mining terms and the court decisions defining the scope of applicability of particular statutes.

(*b*) *Methods of determining fatality rates* in mining and other mineral industries, with reference to the adoption of uniform methods.

(*c*) *Methods of classifying* mining and other industrial *accidents* with a view to the adoption of uniform methods.

II. Methods of mining and treating minerals, with reference to increased economy and efficiency and greater safety.

(*a*) *Metal mining* (surface and underground)—

1. Platinum, gold, silver, and other noble metal ores.
2. Copper, tin, lead, and zinc ores.
3. Iron and manganese ores.
4. Ores of vanadium and other rare metals.

(*b*) Non-metal mining (surface and underground), including oil, gas, and salt wells.

1. Fuels.
   a. Coal, lignite, peat.
   b. Oil and natural gas.
2. Asphalt and other hydrocarbons not used as fuel.
3. Sodium chloride, sodium nitrate, phosphates.
4. Building stones, clays, cement materials.
5. Precious stones.
6. Other minerals.

III. Mining costs.

(*a*) Costs of acquiring title to mineral lands or holding mineral leases; royalties; taxes.

(*b*) Costs of mining, underground and surface, with reference to labor supply and greater use of water power, steam, electricity, and labor-saving machinery.

(*c*) Costs of ore dressing, with reference to labor supply and increased use of labor-saving devices.

(*d*) Transportation costs, with reference to present methods of transportation and the lowering of cost to be effected by better roads, and greater use of aerial conveyors and steam or electric railroads.

IV. Statistics of cost data on the use of electricity in mining, including also discussion on the development of water power especially for this purpose.

V. Hydro-metallurgy.

(*a*) Treatment of the precious metals, including especially recent developments in the cyanide process.

(*b*) Extraction of copper from its ores. (So great developments have recently taken place in this phase of metallurgy that we may say that the whole copper industry seems to be on the verge of a great revolution.)

(*c*) Extraction of zinc and other metals by wet methods.

(*d*) The cost of hydro-metallurgical processes as compared with smelting processes.

VI. Electro-metallurgy.

(*a*) The electrolysis of copper, lead, nickel, and other metals.

(*b*) Electric smelting of ores of iron, copper, nickel, and zinc.

(*c*) Electric refining of steel.

(*d*) The use of electric melting in steel, iron, and brass foundries.

(*e*) The cost of electric processes as compared with fuel processes under conditions of costly fuel.

VII. Fuels.

(*a*) The preparation of pulverized solid fuels of good grade from inferior and dirty coal, lignite, etc.

(*b*) The use of pulverized solid fuel in reverberatory furnaces for melting, smelting, annealing, etc., including its use in the copper, iron, steel, and zinc industries.

(*c*) The use of oil in reverberatory furnaces, with and without preheated air, for melting, smelting, annealing, etc., including its use in the iron, steel, copper, and zinc industries.

(*d*) The use of oil and pulverized solid fuel in special types of furnace.

(*e*) The cost of using oil and pulverized fuels as compared with coal and manufactured gas.

The section on *Mining and Metallurgy* will consider mining problems of the most direct importance to the development of the mineral wealth of a country, and to the promotion of commerce between the

American Republics. Consequently, the topics discussed should be practical and of wide and preferably international interest.

Its general purposes sought are: (1) the assembling of laws governing titles to mineral lands or mineral rights, or specifically applying to the operation of mines, quarries, oil wells, and plants for treating minerals; (2) the discussion of methods of mining and treating ores and minerals of possible commercial importance, with a view to the devising of methods of greater economy and efficiency or increased safety—chemical processes to be considered by the conference on applied chemistry or at joint sessions; (3) showing the items of cost, including mining, treatment and transportation, that determine the price at which a raw mineral or a mineral product can be profitably sold at a shipping port or point of export, and the possible means by which costs of production can be lessened and the development of mineral resources thereby increased; (4) the development of increased efficiency in the purchase of minerals and mineral products, through the use of uniform tests and specifications, and the promotion of economy and efficiency in the utilization of mineral products through the use of improved methods and apparatus, it being recognized that this purpose will also be within the province of the conferences on applied chemistry and of mechanical engineering.

B. Economic Geology and Mineral Resources of the Republics.

Reports and papers descriptive of the *important mineral deposits*, both developed and undeveloped, in the different countries.

Contributions on *Economic Geology and Mineral Resources* should be regional rather than local in interest; should describe and map the distribution area, and mode of occurrence (economic geology) of the particular kinds of deposits, such as iron, coal, petroleum, copper, potash and nitre, gold, silver, tin vanadium, sulphur, lead, etc.; their qualities, characters, and adaptations; the quantities in each area, so far as they may at present be estimated; the state of development in and the accessibility of each area and the present capacity of production of each kind of mineral resources that may be contributed to international trade.

It will be opportune that each participating country shall present for the information of its sister republics and of the world an exposition, through reports and maps, of the mineral resources and products which it has to offer the world in trade, and to invite attention to its important undeveloped mineral deposits, the exploitation of which would increase the prosperity of the country, while contributing to Pan-American commerce. It is designed that

the section of economic geology and mineral resources shall have for its principal aim the presentation of reports, with maps, covering the important mineral resources, both developed and undeveloped, of each republic. It is hoped that these reports, when combined, will constitute in effect a census of the important mineral resources that have been discovered in each country.

C. Applied Chemistry.

Applied Chemistry has for its purpose the isolation and purification of chemical substances found in nature or else the rearrangement of such substances through their interactions so as to produce new chemical substances of benefit to man. In dealing with this subject broadly it is essential to know the sources of supply of raw material and the extent of each. The kind and extent of the energy to be used in effecting these chemical changes. And how largely these resources are availed of in the several countries sending delegates to this Congress. Therefore it is suggested that topics in Applied Chemistry be treated of under the following headings:

I. *General mineral resources of the country.*—Accounts of the extent, accessibility, and availability of ores of iron, copper, lead, zinc, tin, nickel, cobalt, vanadium, phosphorus, gold, silver, platinum, sulphur, petroleum, asphalt, nitre, and other elements and compounds useful in manufacture and commerce.

II. *Extent, availability, and accessibility of the faunal and floral resources.*—Data as to the kind and amounts of animal and vegetable fats and oils, skins, sugars, natural dyestuffs and tanning materials, perfumes, alkaloidal-bearing plants and fungi (especially those affording caffeine and theine), rubber, camphor, and other terpene producers, gums for lacquers and varnishes, and the residues available as fertilizers.

III. *Extent and availability of sources of energy.*—Especial attention should be given to the opportunities for the development of hydro-electric power, and the extent to which it is now developed, since this is of especial usefulness in the electro-chemical industries which have but recently entered upon a career of marked, but as yet, unmeasured usefulness.

IV. *Extent to which the chemical industries are developed.*—Especial attention should be given to iron and steel, gas (in its many forms of production), fertilizers, soap, salt, petroleum refining, coke, gas, explosives, dyestuffs and tanning, leather, and other industries, including those for the manufacture of the acids, bases, and salts, usually styled chemicals.

The participating governments are urged to see that reports and contributions on the mineral deposits of their countries are prepared, in accordance so far as possible with the outline above, and submitted to the Congress for publication. It is suggested that specialists in the different industries be selected for this work; also, that private citizens, engineers, representatives of industrial organizations, and scientific institutions volunteer to prepare reports on various kinds of mineral resources. It is further suggested that the several governments cooperate with such volunteers, as well as with official contributors, extending such governmental aid as may be possible to the writers, in order that the reports may be as complete and as valuable as possible. The highest merit will probably be found in separate papers on particular kinds of deposits submitted by specialist authors. Maps, diagrams, and tables should be used fully to supplement descriptions and statistics.

As to the papers on applied chemistry, representatives from the United States will, in the main, offer papers dealing with the industries of this country which use raw materials from the other countries represented in the Congress.

In this way each country will obtain at first hand information regarding the resources of other countries, and the possibilities of instituting or developing at home industries of like nature, or those utilizing raw materials which it may not hope to produce.

Questions of water supply and of disposal and utilization of sewage and factory waste, so far as these are chemical problems, will be included in the chemistry program; also that of adopting standard methods of analysis for commercial transactions in substances amenable to chemical test.

SECTION VIII.

Public Health and Medical Science.

Gen. Gorgas, *Chairman.*

A. Public Health.

I. Infectious Diseases; the Bearing of their Modes of Infection on Methods of Control.

II. Nutritional Diseases; their Public Health Bearing, with Special Reference to Beriberi and Pellagra.

B. Vital Statistics.

I. Sickness (Morbidity) Reports.

II. Birth and Death Registration.

A. Public Health.

I. *Infectious Diseases; the Bearing of their Modes of Infection on Methods of Control.*—Present views regarding transmission of diseases of vegetables and animal origin. Relative importance of the two classes of diseases in the several American countries. Present status of disease prevention in these countries. Factors influencing the exercise of full measures of control.

II. *Nutritional Diseases; their Public Health Bearing, with Special Reference to Beriberi and Pellagra.*—General consideration regarding the relation of particular constituents of foods and unbalanced diets to health and disease. The peculiarities of diets in the several American countries. The occurrence of cases of nutritional diseases in these countries. Prophylactic measures which our present knowledge indicates. Results obtained in various countries through the application of these measures.

B. Vital Statistics.

I. *Sickness (Morbidity) Reports.*—The relation of sickness reports to health administration. The provisions for their collection in the several American countries. Methods and extent of collection. Responsibility for and means of international notification of communicable disease.

II. *Birth and Death Registration.*—Difficulties of securing registration peculiar to the several American countries. The completeness and accuracy of compiled statistics. The nature of the changes in the birth and death rates during recent years, and the public health significance of these changes.

C. Sociological Medicine.

I. Relation of individual to community—social utility—duties of individual to community and community to individual—health matters of public interest.

II. Ways and means of bringing matters of public health to social usefulness.

(*a*) Sources of information—statistics, health reports, municipal and state surveys.

(*b*) Preparation of legislative measures—committee hearings, etc.

(*c*) Publicity avenues and methods—use of existing organizations, new organizations, press, etc.

III. Public Health Measures.

(*a*) Industrial Hygiene and Sanitation.

1. Hygiene of dangerous trades.
2. Child labor.
3. Employment of married and pregnant women.
4. Factory sanitation.
5. Housing.
6. Public school inspection.

(*b*) Venereal prophylaxis.

(*c*) Alcohol and drug prophylaxis.

(*d*) Tuberculosis.

(*e*) Mental Hygiene.

1. Insane.
2. Defectives.
3. Juvenile delinquency.
4. Criminology.
5. Pauperism.
6. Education.

D. Sanitation.

I. Town and city planning.

II. Buildings for human occupancy.

III. Travel and transportation.

IV. Food supply.

V. Water supply.

VI. Disposal of refuse.

VII. Disposal of the dead.

VIII. Military and naval sanitation.

Each of the subjects named in these several subheadings may be discussed from the standpoint of the sciences and arts directly involved, or from the climatic, the social, the economic, the historical or the legislative standpoint, or from any combination of these standpoints, *in so far as they bear on public health.*

I. *Town and city planning.*—The recent increase in the urban population, and the knowledge we now have of conditions liable to sap

the vitality of the city dweller and to cause disease and premature death, have directed attention to the possibilities for human betterment that lie in the intelligent selection of sites for towns and cities, and in the planning of towns and cities, with a view to the preservation and promotion of health. The possibilities that lie in the remodeling of slum areas in existing towns and cities have been made the subject of much study and may be considered with a view to their more extensive utilization. Water supply, sewerage, street grades and surfacing, lighting, public baths, parks, and playgrounds and other community recreation facilities, may all be considered in their relation to town and city planning.

II. *Buildings for human occupancy.*—Civilized man spends a large part of his life in buildings—in the home, the school, the workshop, the office, the barracks, the hospital, the asylum, the jail, the church, and the theater, etc. These structures exert a powerful influence on the life of the individual and of the race. The selection and preparation of the site; the waterproofing of foundations, walls, and roof; lighting, natural and artificial; drainage and facilities for cleaning and waste disposal; heating—all these are to be considered in their relation to the use to which the building is to be put.

III. *Travel and transportation.*—Travel and the transportation of merchandise form important factors in modern life. Some of their relations to public health are well recognized, as with respect to the dissemination of plague, Asiatic cholera, and other communicable diseases. There are, however, problems in this field as yet unsolved, which may well occupy the attention of the Congress. They cover the relation of the various conditions of travel to the health of the traveler, of the operatives of the agencies of travel and transportation, and of the communities through which travel and transportation passes and in which it terminates. Among them may be mentioned the water supply of railway trains and boats, the disposal of human excreta, and the ventilation of railway cars of various types.

IV. *Food supply.*—The relations between the propagation, manufacture, distribution, storage, and sale of food on the one hand, and public health on the other, should have the earnest attention of the Congress. The connection between wholesomeness and the changes resulting from bacterial processes, the effect of preservatives upon health, the use of coloring matter, and the choice of containers for preserved foods should be considered. The location, planning, construction, and operation of abattoirs, cold-storage warehouses, canning factories, creameries, and cheese factories are subjects within the scope of the section.

V. *Water supply.*—Under this heading will be considered the protection of the water supply used for human consumption, its conservation, purification, and distribution.

VI. *Disposal of refuse.*—Under this topic there is a wide range of matters to be considered, viz, (1) sewage disposal, (2) garbage, (3) ashes, (4) night soil, (5) stable manure, (6) trade wastes, (7) miscellaneous refuse of the household, and (8) street cleanings. The collection, transportation, and ultimate disposal of these classes of refuse will be considered, and incidentally the purity of rivers and other bodies of water.

VII. *Disposal of the dead.*—The historical study of this subject, especially in its relation to the Western Hemisphere, affords a fertile and interesting field. In a more practical way, the locating and planning of cemeteries and the construction and operation of crematories and morgues may engage the attention of the Congress.

VIII. *Military and naval sanitation.*—While the maintenance and operations of military forces involve the same circumstances as arise in civil life—locating and planning barracks and camps, transportation, water supply, food supply, refuse disposal, and disposal of the dead—yet all these have to be adapted to conditions different from those prevailing in civil life. The Congress will expect to learn the results of the experiences, observations, and studies of those who have been engaged in sanitation from military and naval standpoints.

E. Conference on Laboratory.

I. Symposium on Anaphylaxis.
   (*a*) The Antibodies in Anaphylaxis.
   (*b*) Relation of Anaphylaxis to Immunity.
   (*c*) Relation of Experimental Anaphylaxis to Serum Sickness.
   (*d*) The Incubation Period of Certain Diseases as Related to Anaphylaxis.
   (*e*) Anaphylaxis in Tuberculosis.

II. Symposium on Life Histories of Protozoa.
   (*a*) The General Question of Possible Continued Vitality in the Same Environment.
   (*b*) The Effects of Change of Host on Vitality.
   (*c*) The Possibility of Parthenogenesis or Asexual Restoration of Vital Activities.
   (*d*) Conjugation and Fertilization.
   (*e*) The General Question of Species.

SECTION IX.

Transportation, Commerce, Finance, and Taxation.

Dr. Rowe, *Chairman.*

I. Transportation.
- (*a*) Ocean Transportation.
- (*b*) International Railways.
- (*c*) Internal Railway Development.
- (*d*) Harbors, Terminals and Inland Waterways.
- (*e*) Public Highways.

II. Commerce.
- (*a*) Resources and Other Local Conditions.
- (*b*) Development of Domestic Industries.
- (*c*) Foreign Trade Among American Countries.
- (*d*) Measurement of Foreign Commerce.

III. Finance and Taxation.
- (*a*) Taxation.
- (*b*) Investments of Foreign Capital.
- (*c*) Credit and Banking.
- (*d*) A Common Monetary Standard.

I. Transportation.

(*a*) *Ocean Transportation.*—The American countries are now mainly dependent upon European countries for their ocean transportation. European owned ships practically dominate the seas. Adequate ocean carrying facilities are indispensable to the maintenance and extension of foreign commerce. The present war has vividly brought to mind the need for better American transportation facilities. This raises the questions to what extent American countries are developing their merchant marine, what have been the obstacles to such development and how such development can be fostered; to what extent and by what methods governments have owned and operated steamship lines, and with what results.

(*b*) *International Railways.*—While there are railway connections between some American countries, no comprehensive plan has been carried out for bringing the American countries into closer communication by the extension of railway facilities, the establishment of uniform methods of transportation, rates, etc. The feasibility of

the adoption of such plans and the economic results constitute important subjects for discussion.

(*c*) *Internal Railway Development.*—The construction of railways involves such heavy expenditures that in new countries foreign capital is almost indispensable for their development. It is of interest to know what inducements are offered by the various governments for such investments, what are the most effective plans of granting railway franchises and controlling railway operations, and to what extent American Governments have owned and operated railroads and with what results.

(*d*) *Harbors, Terminals and Inland Waterways.*—Important factors in the development of a country's resources are the means of inland water transportation, the harbor facilities and the connection between these and the railroads. The systematic planning of these facilities, the methods of securing funds for their construction (national and local division of expense), the charges to be imposed in the traffic and the supervision of rate charges, are questions to be studied in connection with the commerce of a country.

(*e*) *Public Highways.*—In new countries where railways have not been extensively developed the condition of the public highways practically determines the development of the national resources. The nature and extent of public highways, their adaptability to the traffic, especially in view of the increased use of motor vehicles, and the policy of the governments with regard to providing funds for their construction and maintenance are subjects on which a comparison of the experiences of different countries would be of value.

II. Commerce.

(*a*) *Resources and Other Local Conditions.*—The people of the United States have a very limited knowledge of the Central and South American countries, and the latter of the United States. Discussions by representatives of the various countries concerning the resources, population, systems of government, industrial and commercial advantages, social customs, cost of living, wages, etc., of each country would be of mutual advantage.

(*b*) *Development of Domestic Industries.*—The United States is now evolving from an agricultural to a manufacturing country. Central and South America export most of their raw products and import nearly all of their manufactures. Many raw products of these countries could be more economically manufactured in the countries of their origin if sufficient technical knowledge, money, and labor were available. In the production of raw materials,

primitive methods are sometimes used because industries are conducted on a small scale. This raises the question as to what methods each country is employing to encourage manufactures near the sources of the raw materials, such as making concessions of land, granting exemptions from taxation, levying protective duties on imports, encouraging industrial combinations, cartels, etc., and what has been the experience of each country in this field of endeavor.

(*c*) *Foreign Trade Among American Countries.*—South and Central America are mainly food and raw material producing countries. They must find markets abroad for their products and must secure what they need of manufactured products by an international exchange of commodities. Most of the trade of Central and South America is with Europe, because Europe offers better transportation, credit, and banking facilities and the business men supply the quality or kind of goods demanded, and foster cordial personal relations. Attention should be directed to the possibilities and the economic advantages of securing better trade relations between the United States and the other American Republics.

(*d*) *The Measurement of Foreign Commerce.*—In order to know the extent of the foreign trade of a country both for commercial purposes and for purposes of taxation, statistics are collected of the quantity and value of the imports and exports. There is no uniformity of method either in the recording of such trade movements or in the classification of the commodities. Furthermore, there is no uniformity of requirements with regard to consular invoices, the furnishing of manifests and entries, etc. The desirability and the feasibility of steps to secure such uniformity are proper subjects for discussion.

III. Finance and Taxation.

(*a*) *Taxation.*—While all American Republics have the same form of government, they are new countries whose resources need to be developed. While capital is needed for such development and valuable concessions are sometimes made to foreign corporations, the state is entitled to a fair measure of the receipts from the products of such exploitation. The form of taxation must be so arranged that the development of the resources of a country is stimulated rather than retarded. It is interesting to know what has been the experience of each country with regard to its fiscal system. The questions which suggest themselves are: To what extent and with what effect upon the domestic industries, does the government derive its revenue from imports and exports; income, inheritance,

real and personal property and the various forms of business taxes? Are discriminations made against aliens? What special forms of taxation are best adapted to the needs of the American Republics? To what extent can reciprocal tariff concessions bring about closer trade relations between the American Republics?

(*b*) *Investment of Foreign Capital.*—Practically all American countries owe their development more or less to the use of foreign capital, either in the form of loans or by direct investment in American enterprises. There should be a discussion of the advantages and disadvantages to a new country of such a plan of development, the forms of security required for such loans, the conditions of investment (such as requiring the borrower to purchase his materials and supplies from the lender or his compatriots) and the policy of giving liens on the customs receipts when public loans are made.

(*c*) *Credit and Banking.*—One of the principal reasons why European exporters have been able to excel in the development of their foreign trade with Central and South America has been their liberality in the extension of credits to their customers. Furthermore, the Europeans have organized systems of banks in these countries to provide the needs of the credit systems established. The South American prefers to buy where he can obtain the most favorable facilities for payment. A debatable question is how far the American manufacturer can go to meet the legitimate demands for credit on the part of foreign purchasers, what banking arrangements are needed to facilitate such transactions; also what improvements can be made in the banking systems of the American countries with special reference to international banking relations.

(*d*) *A Common Monetary Standard.*—The Central and South American countries have various monetary units ranging in value from the bolivar of Venezuela to the Uruguayan peso. International exchange among the American countries would be facilitated if a common monetary standard were adopted, as was done by the countries belonging to the Latin and Scandinavian Monetary Conventions. There should be a discussion of the feasability of such an agreement among all the American nations.