

more than half a thousand American chemists have joined hands, and it is their united hand, big, brawny, and right honest in its grasp, which is extended to you to-day.

Thus in the lesson of this congress we learn not only of the special forms of activity as manifested in the titles of our papers, but we have before us a larger, unprinted program, a splendid plate, illuminated with the light of higher and broader views, bearing a greeting of good fellowship and fraternity and the promise of a more intimate union of all science.

**PROCEEDINGS OF THE CONGRESS ON CHEMISTRY
HELD IN CHICAGO, ILL., AUGUST 21
TO AUGUST 26, 1893.**

MONDAY, AUGUST 21.

THE congress was opened by H. W. Wiley, chairman of the Joint Committee and president of the American Chemical Society, who gave an address of welcome to the foreign and American delegates, and suggested the establishment of a Triennial International Congress on Chemistry to meet at various centers.

It was voted to appoint a committee of five to take the recommendation under consideration.

TUESDAY, AUGUST 22.

The session was opened by an address from Prof. E. Engler, of the Polytechnic School at Carlsruhe, who had been appointed honorary president for this day

The printed program of papers on analytical chemistry then followed as nearly as practicable, the following being presented in full or in abstract:

Opening Address. On Certain Distinct Advances in the Analytical Chemistry of Recent Years. Prof. A. B. Prescott, Ann Arbor, Mich.

On the Determination of Phosphoric Acid as Magnesium Pyrophosphate. Hugo Neubauer, Rostock.

Concerning the Method of Determining the Melting Point of Butter Fat. Prof. Adolf Mayer, Director of the Royal Experimental Station at Wageningen, Holland.

The Work and Aims of the Committee on International Standards of the Composition of Steel. Prof. John W. Langley, Cleveland, Ohio.

The Need of Standard Methods for the Analysis of Iron and Steel, with Some Proposed Standard Methods. Charles B. Dudley, Altoona, Pa.

On motion, the subject of standard methods for the analysis of iron and steel was referred to the Committee on International Standards of the Composition of Steel.

The reading of papers was then resumed as follows :

A New Blow-pipe Reagent. Prof. W. B. Rising, Berkeley, Cal.

Determination of the Crystallizable Sugar in Beets. H. Pellet, Paris.

Discussion of the Foregoing Paper by H. Vilmorin, of Paris.

Review of the Standard Methods of Potash Determination. Norman Robinson, State Chemist of Florida.

Accuracy in the Analysis of Dairy Products. H. Droop Richmond, Chemist to the Aylesbury Dairy Company, London, Eng.

The Desirability of a System of Standards for Unifying the Results of Analysis. Prof. J. W. Langley, Cleveland, Ohio.

On Standard Methods of Oil Analysis. Prof. Ernest Milliau, Marseilles, France.

The Determination of the Sugars in Condensed Milk. W. D. Bigelow and K. P. McElroy, Washington, D. C.

Note on the Detection of Preservatives in Condensed Milk. K. P. McElroy and W. D. Bigelow, Washington, D. C.

A Rapid and Accurate Method of Determining the Moisture and Oil in Linseed Cakes and Other Feeding Stuffs. A. P. Aitken, D.Sc., Chemist to the Highland Agricultural Society of Scotland.

WEDNESDAY, AUGUST 23.

Prof. George Thoms, of the Polytechnic School, in Riga, opened the session as honorary president for the day.

Dr. J. H. Long, of the World's Congress Auxiliary, announced the arrangements for excursions to the chemical exhibits of the Columbian Exposition and to industrial works of Chicago.

Papers were then read representing three sections as follows :

BIBLIOGRAPHY.

Opening Address. An International Index to Chemical Literature. H. Carrington Bolton, New York.

A Partial Bibliography of the Occurrence of Copper, Tin, Lead, and Zinc in Animal and Vegetable Tissues, Food, Drink, Etc. Mrs. Karl Thayer Pomeroy-McElroy, Washington, D. C.

E. Hart, Robert B. Warder, and W. L. Dudley were appointed as a special committee to consider Dr. Bolton's suggestion for an International Committee on Bibliography, and to report on Thursday.

INORGANIC CHEMISTRY.

Opening Address. On the Revival of Inorganic Chemistry. Prof. F. W. Clarke, U. S. Geological Survey, Washington, D. C.

The Specific Gravity of Some Gem Stones. Prof. A. Liversedge, University of Sydney.

Origin of Sulphate of Soda in the Air, and the Mechanical Effects of Sulphate of Soda. F. Parmentier, University of France, Faculty of Sciences of Clermont-Ferrand.

On Carborundum, Amorphous Carbide of Silicon. Dr. Otto Mülhausen.

ORGANIC CHEMISTRY.

Opening Address. Recent Progress in the Chemistry of Colors. Prof. Otto N. Witt, Berlin.

Researches on the Synthesis of Polyhydric Alcohols. Prof. B. Tollens, Göttingen, Germany.

Are Pentoses Formed by the Assimilation Process? G. de Chalmot, Richmond, Va.

The Analogy Existing Between Narcotine and Narceine. Dr. G. B. Frankforter, Lincoln, Neb.

The New Formula for Narceine and its Alkaline and Ethereal Salts. G. B. Frankforter, Lincoln, Neb.

The Action of Phenylhydrazine on 1:2 Ketols. Alexander Smith and J. H. Ransom, Wabash College, Crawfordsville, Ind.

On the Preparation of Pure Tannins. Prof. Henry Trimble, Philadelphia.

The Artificial Production of Petroleum. Prof. E. Engler, Carlsruhe.

An invitation was received to a reception to be tendered to the officers, speakers, and delegates of the various Congresses on Science and Philosophy, in the Art Institute, on Thursday at 9 P. M.

The congress adjourned to meet in the Columbian Exposition, at Merck's pavilion at 3 P. M.

THURSDAY, AUGUST 24.

The session was opened by Prof. Henry P. Proctor, of Leeds, honorary president for the day, who spoke on technological

education and laboratories. The following papers were then read:

AGRICULTURAL CHEMISTRY.

Opening Address. History of the Development of the Agricultural Experiment Stations in the United States. Prof. W. O. Atwater, Middletown, Conn.

The Valuation of Arable Lands on a Scientific and Statistical Basis. Dr. George Thoms, Professor of Agricultural Chemistry in the Polytechnicum at Riga.

The Chemical and Physical Investigation of Virgin Soils. Prof. E. W. Hilgard, Berkeley, Cal.

Water Bath for Continued Digestion of Soils under Pressure. Prof. R. C. Kedzie, Agricultural College of Michigan.

Progress in the Methods of Analysis of Cattle Foods. F. W. Woll, Madison, Wis., and Prof. G. L. Teller, Fayetteville, Ark.

The Supply of the Dairy Products Consumed in Great Britain and Ireland. Mr. Richard Bannister, London, Eng.

Experiments with Mineral Fertilizers on the Sugar Beet. A. Vivier, Director of the Agricultural Station of the Seine et Marne, Medun, France.

Contributions to the Study of Oil Cakes used in Feeding. Prof. C. V. Parola, of the Experimental Station of Chartres, France.

A Practical Means of Determining the Nitrifying Power of an Arable Soil. Prof. P. Pichard, of Beanne, Côte d'Or, France.

Milk, Skim Milk, and Whey; a Study of their Comparative Composition and Specific Gravity. Prof. C. B. Cochran, West Chester, Pa.

Notes on Ammonium Citrate Solubility of Water-Insoluble Phosphate. Stephen Lincoln Goodale, Saco, Me.

Botrytis Bassiana and its Crystalline Products. E. Verson, Director of the Royal Experimental Station, Padova, Italy.

International Co-operation in the Domain of Biological and Agricultural Chemistry. Prof. W. O. Atwater, Middletown, Conn.

American Progress in Methods of Nitrogen Determination. Charles L. Parsons, Professor of Chemistry in New Hampshire Agricultural College.

Some Points Relating to the Composition of Cow's Milk. Dr. L. L. Van Slyke, of New York Agricultural Experiment Station.

The Composition of American Cheddar Cheese. Dr. L. L. Van Slyke, of New York Agricultural Experiment Station.

The committee appointed on Wednesday to consider the

recommendations of Dr. H. C. Bolton made the following report, which was adopted by the congress :

TO THE CONGRESS ON CHEMISTRY :

Your committee, having considered the suggestions of Dr. Bolton, recommend that a communication be addressed from this congress to the national chemical societies of England, France, Germany, Italy, Russia, and America, reporting the following action by this congress :

"Whereas, Some activity has been shown of late years in the compilation of bibliographies of various subjects, but without the uniformity and system which are desirable,

"*Resolved*, That we recommend the annual publication of classified bibliographies by the chemical societies of England, France, Germany, Italy, Russia, and America, for these several countries.

"*Resolved*, That we recommend each of these societies to appoint one representative upon an international committee to confer together and report to the several societies a scheme for an International Co-operative Index to Chemical Literature."

	Respectfully submitted,	
[Signed]	EDWARD HART,	}
	ROBT. B. WARDER,	
	WM. L. DUDLEY.	
		Committee.

On motion of Prof. W. O. Atwater it was also resolved :

That a committee of chemists of different countries be appointed to consider means of international co-operation in the domain of biological and agricultural chemistry.

F. W. Clarke, C. E. Munroe, Edward Hart, H. C. Bolton, and W. O. Atwater were appointed as Special Committee on Triennial International Chemical Congress, and on International Co-operation in Bibliography and in Biological and Agricultural Chemistry.

FRIDAY, AUGUST 25.

Prof. George Lunge, of Zurich, Switzerland, served as honor-
ary president for the day.

The following papers were presented :

TECHNOLOGICAL CHEMISTRY.

Opening Address. Dr. Wm. McMurtrie, New York.

The Development and Present Condition of the Fertilizer Industry of the United States. Charles U. Shepard, Charleston, S. C.

On the Examination of Tanning Materials. Prof. H. R. Proctor, Leeds, England.

- Recent Development of Mineral Tanning in the United States. Prof. S. P. Sadtler, Philadelphia, Pa.
- Petroleum in its Relations to Asphalt Pavements. Prof. S. F. Peckham, Ann Arbor, Mich.
- Natural Soda. Dr. T. M. Chatard, Washington, D. C.
- Chemical Industry of the United States. Henry Bower, Philadelphia.
- Condensation, Especially as Applied to the Distillation of Nitric Acid. Prof. Edward Hart, Easton, Pa.
- The Use of Electrolysis in Industrial Chemical Operations. Prof. J. W. Langley, Cleveland, Ohio.
- Petroleum. Prof. E. Engler, Carlsruhe.
- Asphalt; Its Occurrence, Composition, and Technology. F. P. Vandenberg, Buffalo, N. Y.
- Kryolith and its Industrial Application. Theodore Armstrong.
- The Fulminates; Their Preparation and Use. Prof. Charles E. Munroe, Washington, D. C.
- The Commercial Preparation of Calcium Phosphide. Prof. Charles E. Munroe, Washington, D. C.
- The Influence of Patent Laws on the Development of Chemistry. Prof. R. L. Biedermann, Berlin.
- The Manufacture of Essential Oils. Charles A. Serre.
- Some Chemical and Mechanical Considerations Involved in the Recovery of Animal Fibers. Louis J. Matos, Philadelphia.
- The Purification of Water. Prof. C. A. Doremus, New York.

SATURDAY, AUGUST 26.

Prof. A. B. Prescott served as honorary president for the day.
The following papers were presented:

DIDACTIC CHEMISTRY.

- Opening Address. Prof. W. E. Stone, Lafayette, Ind.
- Opening Paper. How Chemistry is Best Taught. Prof. C. F. Mabery, of the Case School of Applied Science, Cleveland, Ohio.
- The Education of Industrial Chemists. Dr. George Lunge, Zurich, Switzerland.
- The Teaching of Industrial Chemistry in Colleges. Henry Pemberton, Jr.
- Laboratory Work Must Be Subordinate and Auxiliary to the Presentation of Facts, Laws, and Theories by the Teacher. Prof. R. W. Jones, University of Mississippi.
- Quantitative Work for Beginners in Chemistry. Prof. W. A. Noyes, Rose Polytechnic Institute, Terre Haute, Ind.

PHYSICAL CHEMISTRY.

Opening Address. The Cross-Fertilization of the Sciences. Prof. R. B. Warder, Washington, D. C.

On Chemical Energy. Prof. W. Ostwald, University of Leipzig.

The Energy Theory of Chemistry. (Comment upon Prof. Ostwald's Paper.) Prof. J. H. Trevor, Cornell University.

On the Atomic Weight of Oxygen. Prof. E. W. Morley, Cleveland, Ohio.

Apparatus for Promoting the Interaction of Liquids and Gases. Dr. Geo. Lunge, Zurich, Switzerland.

Stereochemistry of the Polymers of Acetic Aldehyde. Prof. W. R. Orndorff, Ithaca, N. Y.

SANITARY CHEMISTRY.

Efficiency of a System of Ventilation as Shown by the Amount of CO₂. Ellen H. Richards, Boston, Mass.

The congress then adjourned, the chair voicing the general sentiment, that the efforts made had been followed with most gratifying success.

ROBT. B. WARDER, Secretary.

Persons in Attendance.

Members of American Chemical Society.

H. W. Wiley.	William Simon.	Wm. Frear.
Robert B. Warder.	E. H. S. Bailey.	Frank B. Dains.
K. P. McElroy.	Dr. Fred. Hoffman.	G. E. Barton.
W. D. Bigelow.	G. S. Fellows.	C. R. Stuntz.
G. de Chalmot.	Philip E. Chazal.	R. E. Blouin.
A. A. Bennett.	Pontus H. Conradson.	W. G. Brown.
J. H. Long.	Chas. L. Reese.	Wirt Tassin.
T. C. Trescot.	Albert L. Smith.	Geo. Steiger.
Georgé A. Prochazka.	Morris Loeb.	Frank T. King.
Edward Hart.	J. Stockly Cary.	Chas. H. Miller.
W. A. Puckner.	Emil Furst.	A. H. Sabin.
Claude C. Hamilton.	Wm. Hoskins.	Jas. G. Hyndman.
E. H. Bartley.	Frank T. Shutt.	E. Sauer.
E. A. de Schweinitz.	Max H. Wickhorst.	Wm. McMurtrie.
W. W. Daniells.	Alfred Springer.	Thomas M. Chatard.
Wm. L. Dudley.	Henry Pemberton, Jr.	H. B. Nason.
August Eimer.	Charles L. Parsons.	Edward R. Hewitt.
J. N. Hurty.	Henry B. McDonnell.	W. O. Atwater.
William H. Krug.	Otis C. Johnson.	Frank Juliau.
B. B. Ross.	W. A. Noyes.	R. W. Jones.
Albert E. Menke.	P. A. Mackay.	Alfred Hoffmann-Pinther.
Charles B. Dudley.	E. M. Danglede.	R. C. Kedzie.
A. S. Metz.	Thomas H. Norton.	A. B. Prescott.
F. W. Clarke.	S. P. Sharpless.	M. A. Scovell.
H. A. Huston.	Russell Elliott.	Wm. Bramwell.
Charles A. Doremus.	H. L. Grant.	J. F. Gregory.
Marcus Benjamin.	Herman Frasch.	J. T. McGill.
Ervin E. Ewell.	A. V. E. Young.	

World's Congress.

Richard H. Gaines.	W. A. Barrows, Jr.	E. Kennard Mitting.
M. H. Kauffman.	Julius Stieglitz.	Fred. A. Gritzner.
J. H. Kastle.	Rudolf de Roode.	W. H. Test.
Herbert W. Smith.	Henry F. Curtis.	Dr. George F. Payne.
G. L. Teller.	W. B. Rising.	J. E. Simman.
Ludwig Saarbach.	T. F. Colin.	D. M. Henins.
B. W. Kilgore.	Mrs. Karl Thayer	Geo. H. Loesch.
Allen Hazen.	Pomeroy-McElroy.	W. A. Wilbers.
C. B. Cochran.	Chas. H. Herty.	J. E. Moore.
J. A. Heberly.	Alexander Smith.	Saml. Stockton Voorhees.
Vecheslav Tistshenko.	Henry Trimble.	L. L. Van Slyke.
Prof. A. Haller.	E. Goldsmith.	H. E. Smith.
C. W. McCurdy.	Dr. Otto L. Salomon.	A. I. Winton.
Russell W. Moore.	William Brady.	Robert Wahl.
Dr. E. J. Bughausen.	S. F. Peckham.	Arnold K. Reese.
Dr. Otto Miihhaenser.	Louis Rule.	H. P. Armsby.
Dr. Arthur W. Burwell.	Otto N. Will.	Henry R. Cheers.
J. B. Lindsay.	Dr. P. Naef.	William C. Stubbs.
C. Weidington.	H. N. Stokes.	James Boyce.
S. Tanaka.	E. Seelechohn.	E. A. Scribner.
V. O. Peterson.	R. O. Graham.	Jno. M. McCandless.
J. C. Foye.	B. S. Summer.	Louis Kahlenberg.
August Weingartner.	Fred. M. Wills.	B. D. Westenfelder.
R. P. Williams.	Sam. P. Sadler.	C. O. Bates.
Arthur M. Comey.	B. von Herff.	S. M. Babcock.
W. E. Stone.	W. Gebhardt.	Mr. Goodell.
Dr. Rudolf Knietsch.	Chas. Ford Langworthy.	H. Schweitzer.
Henry L. de Villmorin.	H. Mounouth Armit.	E. E. Slosson.
C. F. Mabery.	George William Rolfe.	Wm. Louis Wilson.
Dr. G. Thoms.	H. L. Wheeler.	T. H. Clark.
John W. Langley.	Rich. J. Fischer.	Lyman F. Kehler.
Reuben Haines.	James C. Graves.	M. Gomberg.
Henry C. Wulf.	Henry R. Jessel.	Wm. H. Seaman.
H. W. Bilyer.		

CHEMICAL NOTES FROM THE COLUMBIAN EXPOSITION. II.

By J. H. LONG.

Received August 14, 1893.

DEPARTMENT H.—MANUFACTURES.

THE chemical exhibits of greatest interest are found in the Department of Manufactures. It must be confessed that as a whole the display is somewhat disappointing, because it is very unevenly distributed, one nation making more than one-half of the whole exhibit.

The nations showing chemicals are the United States, England, France, Germany, Russia, Sweden, and Italy. According to the catalogue, Switzerland makes one display of