

Dr. Harvey W. Wiley. "The Agricultural Possibilities of our New Possessions."

Prof. C. B. Cochran. "Butter and Butter Fats."

Dr. Robert H. Bradbury. "Reaction Velocity."

Dr. Henry Leffmann. "Digestive Ferments with Especial Reference to the Effects of Food Preservatives."

Mr. Lyman F. Kebler. "Bébées."

Mr. Lyman F. Kebler. "Notes on Estimating Eucalyptol."

Dr. W. J. Williams. "Methods for Examination of Explosives."

The Section, as will be perceived from this brief summary of its activity fully maintained its reputation as a live working branch of the Institute, and its future prospects were never more satisfactory.

Respectfully submitted,

LEE K. FRANKEL, *President*.

PHILADELPHIA, January 1, 1899.

REPORT OF THE MINING AND METALLURGICAL SECTION FOR THE YEAR 1898.

To the Committee on Sectional Arrangements.

GENTLEMEN :—The Mining and Metallurgical Section of the Franklin Institute presents the following report of its operations during the year 1898 :

Membership.—The accessions to membership during the year were seven. Total membership, December 31, 1898, seventy-seven.

Meetings.—The Section held twelve meetings during the year, of which one was a joint meeting with the Numismatic and Antiquarian Society.

General Remarks.—The extended discussion which several of the papers read at the meetings called forth, affords the best evidence that could be desired of the live interest taken by the members, and the safest guaranty of its continued activity as a useful branch of the Institute. Nearly all the papers enumerated below, with the discussions thereon, have been deemed sufficiently meritorious to be published in the *Journal*.

The activity of the Committee on Papers, and its successful efforts in filling the program of the Section meetings, for practically the entire season, with interesting and important communications, have been most commendable, and have fully justified the expectations of the founders of the Section that it could be made a center from which most valuable work would emanate. The Section appears now to be firmly established, and its future career promises well for the Institute.

In taking a brief retrospective view of progress in mining and metallurgical industries of the United States, and of the world as well, during the past few years, it becomes apparent that this Section of the Institute was inaugurated at an opportune moment.

Phenomenal activity prevails in nearly all branches of mining and metallurgy, while the recent production of crude material has not only surpassed all former records, but has exceeded all expectations and astonished the whole world.

An official report of the "Mineral Products of the United States," for the calendar years 1888 to 1897, inclusive, recently issued by the United States Geological Survey, shows that the production of gold from the mines of the United States increased from 1,604,927 troy ounces, having a coining value of \$33,175,000, in 1888, to 2,774,933 troy ounces in 1897, having a coinage value of \$57,363,000. The production of silver increased from 45,783,632 troy ounces in 1888, having coining value of \$59,195,000, to 53,860,000 troy ounces in 1897, having coining value of \$69,637,172; the production of copper increased from 231,270,622 pounds in 1888, to 491,638,000 pounds in 1897; the production of lead increased from 131,919 tons in 1888, to 208,192 tons in 1897; the production of zinc increased from 55,903 tons in 1888, to 99,980 tons in 1897.

The most remarkable increase in production, however, is found in the metal aluminum, of which 19,000 pounds were produced in 1888, and 4,000,000 in 1897.

In the list of non-metallic mineral products, given in the official report herein quoted, similar gains are recorded in many instances. The output of petroleum, for example, increased from 27,612,025 barrels in 1888, to 60,586,081 barrels in 1897. The production of bituminous coal increased from 102,039,838 short tons in 1888, to 147,789,902 short tons in 1897. The anthracite coal production of Pennsylvania in 1888 amounted to 41,624,611 long tons, and in 1897 to 46,814,074 long tons.

Improved mining and metallurgical methods have practically created value in many low grade ores which could not be profitably worked under old methods. The cyanide process for recovering gold from tailings and from lean ores of certain kinds, is not yet ten years old in its practical application to gold mining, yet it is stated that one-third of the gold of the South African field is now obtained by this process.

The United States, by reason of its recently acquired supremacy in the production of iron and steel in all forms, has now taken a leading industrial position among the great nations of the world, and the proceedings of the various technical societies—of which the Franklin Institute is one of the most venerable and most highly respected, both at home and abroad—attract world-wide attention.

For these and other reasons it may be confidently expected that the future career of the Mining and Metallurgical Section of the Franklin Institute will be one of continued expansion and usefulness.

A. E. OUTERBRIDGE, JR., *President.*

PHILADELPHIA, January 1, 1899.

APPENDIX.

The following list embraces the authors and titles of the papers and communications presented before the Section during the past year:

Pedro G. Salom. "The Electrolytic Production of Lead from Galena."

Benj. S. Lyman. "Some Illustrations of the Influence of Geological Structure on Topography."

Paul Kreuzpointner. "The Practical Aspects of Present Commercial Methods of Testing Iron and Steel."

Capt. E. L. Zalinski, U. S. A. "Japanese Swords."

Robert W. Lesley. "Development of the American Portland Cement Industry."

Prof. Alexis A. Julien. "Building Stones; Elements of Strength in their Constitution and Structure."

Raimundo Cabrera. "The Mineral Resources of Cuba."

Miltiades Th. Armas. "Reduction Works for Silver Ores at Aduana, Sonora, Mexico."

Wm. Tatham. "Gold Mining in Georgia."

G. H. Clamer. "The Microstructure of Bearing Metals."

Wm. Griffith. "Anthracite Coal in Peru."

A. E. Outerbridge, Jr. "The Mining and Minting of Gold and Silver."

A. E. Outerbridge, Jr. "A Study of the Micro-Structure of Bronzes."

Wm. R. Webster. "Specifications on Structural Steel and Rails."

Prof. H. C. Mercer. "Fresh Studies of Pioneer Tools."

Prof. T. C. Hopkins. "The Feldspars and Kaolins of Southeastern Pennsylvania."

ANNUAL REPORT OF THE ELECTRICAL SECTION FOR THE
YEAR 1898.

To the Committee on Sectional Arrangements.

GENTLEMEN:

Officers.—The business of the Section has been conducted by the following officers:

President, Mr. Walter E. Harrington.

Vice-President, Mr. G. U. G. Holman.

" " Mr. Thomas Spencer (resigned May 2, 1898).

Secretary, Mr. J. A. LaFore (resigned January 8, 1898).

" Mr. Wm. Warr (resigned August 3, 1898).

At this writing no Secretary is in office.

Membership.—The membership at the beginning of the year was 105. At the present date the number of members is 116, including all names which have been dropped from the roll. This is an increase of nine members over last year.

Meetings.—The regular monthly meetings were held during the year, at which the average attendance was fifteen; this is a decrease over the preceding year.

Papers (read in 1898):

Mr. David Pepper. "Line and Return Circuit Construction of Electric Rugs."

Mr. Herbert Laws Webb. "The Telephone Exchange."

Prof. Arthur Goodspeed. "Recent Advances in Radiography."

Discussion.—Rail Bonding. Opened by Mr. Walter E. Harrington.

Mr. Wm. A. Rosenbaum. "The Status of Electrical Invention."

Mr. J. H. Cook. "The Jenkins Improved Lamp Holders for Incandescent Lamps."

Mr. A. J. Wurts. "Lightning and Lightning Arrestors."