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Proceedings of the Twenty-Second Annual Session of the Iowa Academy of Science: Staff & Committee Reports; Program

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PROCEEDINGS OF THE Twenty-Second Annual Session of the Iowa Academy of Science

The meetings of the twenty-second annual session of the Iowa Academy of Science were held in the Chemical Lecture room at the Iowa State Normal School, Cedar Rapids, on May 1 and 2, 1908.

In the business meetings the following matters of general interest were presented:

REPORT OF THE SECRETARY.

To the Members of the Iowa Academy of Science.

The twenty-first annual meeting of the Academy was held at Drake University, Des Moines, on Friday and Saturday, April 26 and 27, 1907. The meeting was well attended. When called to order on Friday afternoon nineteen members were present. The papers presented at the meeting were interesting and valuable. The Academy was fortunate in being able to hear two excellent public lectures by Professors H. L. Russell and W. W. Campbell at the evening meeting.

The membership list is undergoing a revision that the committee is attempting to make thorough. Quite a number of names appear in the list in the Proceedings that will be stricken out in accordance with the requirements of the by-laws. At the last meeting four new names were proposed for fellows, two were transferred to the corresponding members list, and fourteen names were proposed as associate members. These names were all acted upon favorably by the council. By some error, the addresses of most of those proposed as members did not reach the secretary and correspondence with the fellows of the Academy failed to obtain the desired information with reference to eight of the number. A repetition of such an error is not probable.

The publication of the Proceedings has been delayed even more than it was last year. The meeting of the Academy was held in April; the last paper for publication was not received by the secretary until in August, although the endeavor was made to collect them early after the meeting. The Executive Council of the State is very careful concerning the ordering of State printing. A delay was caused by the Council awaiting a decision of the Attorney-General with reference to its powers in relation to the publication. Another delay was

due to the fact that when the manuscript of the Proceedings was ready for publication the State Printer was at work on the Code. The result was that nothing could be done on the Proceedings until January, 1908, and then the work was slow because of other State work in press. An attempt has been made in the notices of the meeting of 1908 to impress upon the members of the Academy the necessity of compliance with the regulations requiring copies of papers presented to be left with the secretary at the time of the meeting and in typewritten form. If the manuscript can be given to the printer early after the meeting then no great delay is probable as there is little State work in the office during the summer.

The value of the work of the Academy should increase from year to year. It is very true that the great majority of the members do not have much time available for scientific investigation. Routine class work or professional duty requires most of the time and energy; but if the members will decide very early in the year to make reports upon some certain lines of study it is probable that sufficient time for more good work may be found.

Respectfully submitted,

L. S. ROSS, Secretary.

REPORT OF THE COMMITTEE ON THE METRIC SYSTEM.

1. When the Congressional Committee on Coinage, Weights and Measures decided not to report the Littauer bill back to the House of Representatives, another chapter in the fight for the introduction of the metric system in this country was closed. A large number of the manufacturers and some engineers are still strongly opposed to the passage of such a bill, even if it provides, as in this case, for the use of the metric system only by the various departments of our national government.

But it can hardly be claimed, even by the most sanguine supporters of the present confusion of weights and measures, that the metric movement has been definitely disposed of. A careful study of the voluminous report of the congressional committee shows this clearly.

The assertion is often made that the supporters of the bill were merely professors and theorists without knowledge of practical affairs and that a discussion of the merits of the system is purely of academic interest. It is true that the theorists stand together on this question, but it is also true that there is by no means perfect harmony on the other side. Many large manufacturing concerns have come over to us and a great number of engineers are strongly in favor of the introduction of the metric system.

To give an example: The standardization committee of the American Institute of Electrical Engineers submitted in April, 1906, the following resolution to be voted upon by the members of this large and influential society: "That the committee unanimously recommends the introduction of the metric system into general use in the United States at as early a date as possible without undue hardship to the industrial interests involved." Out of 1,747 votes, received a month later, 1,569 favored the resolution.

2. Strongly convinced of the final victory of our case, your committee presents herewith a short review of the substantial progress made by the metric system during the past few years in all civilized countries.

To begin with an apparent defeat, namely the rejection of a bill providing for the obligatory use of the metric system in Great Britain, this bill was passed by the House of Lords, but defeated March 22, 1907, in the lower house by the small majority of 150 to 118. Such a close vote would have been impossible only a few years ago and shows clearly the decided change which has taken place in the attitude of the British public. Over 50 Chambers of Commerce, sixty teachers' associations, inspectors of weights and measures in 80 districts, thirty retail trades associations and numerous chambers of agriculture and farmers associations endorsed the bill, and the congress of trades unions representing some five million workmen passed unanimously a resolution in favor of it. There exists in England a strong society, the Decimal Association, with 1,500 members, drawn from all classes of the population—members of parliament, scientists, manufacturers, etc.—all working for metric reform. Has not the time arrived for all of us who are interested in this important question to band together and take a more active part in this great educational movement?

That the majority of the British colonies have strongly declared in favor of the introduction of the metric system is well known. Mauritius and the Seychelles are already metric countries, while New Zealand passed a bill in 1905 authorizing the establishment of the system by the government.

And now let us turn to other than English-speaking countries. A decree of Sept. 25, 1905, made the system obligatory in all Portuguese colonies; in Denmark a law was passed May 5, 1907, requiring the use of the metric system for all public acts except in the land survey, the date for its enforcement to be fixed by the king, but not later than 1910.

China is seriously considering the adoption of a uniform system of weights and measures and its ambassadors to the various civilized countries are making a thorough investigation of the various systems in use. Let us hope that this means another country added to the already large number of countries where the metric system is used exclusively.

3. Legislative action is doubtless necessary to secure for a country a uniform and efficient system of weights and measures; but everyone recognizes that the mere passage of a law is not sufficient to make the metric system a success. It must work out its own destiny; if the people have not been sufficiently educated to appreciate its advantages and are not in sympathy with such a legislative measure, its enforcement is made very difficult, as for example in Turkey, Greece and Portugal. The metric system must in fact first conquer a country unaided by laws and statutes, while these must finally be passed to restrain those who do not want to learn, from doing mischief.

The metric system shows its greatest advance during the past few years outside of legislative domain. In Japan, for example, it is taught now in schools and is used almost exclusively in geodetic work, meteorology, medicine, pharmacy and in the army; in Egypt, though most of the officials are Englishmen, it is used in the public works department, the customs, postoffice and railways.

Still more important seem the steps taken by large international associations representing important industries. The international screw system is being introduced rapidly in large continental factories and especially for screws of smaller size it is used by the great majority of watchmakers all over the world.

The international association of silk manufacturers has accepted the metric system so that Mr. Roy in a report to a congress held in 1905 in Manchester could say that it is used now everywhere in the silk trade.

In the manufacture of lenses and optical instruments it has replaced the old system, it is being introduced for the measurement of bullets, and was accepted as the sole standard by the international aeronautic association.

The carat, a unit of mass used for jewels and precious stones, has 22 different values ranging all the way from 188.5 mg. to 254.6 mg. In April, 1905, the international commission of weights and measures proposed to have the carat represented by a mass of 200 mg. Assurance that this proposition will be accepted has been given by the association of jewelers in Paris (1905), Germany, Antwerp (1906), Prague, Melbourne and Great Britain (1907).

4. Finally let us return to our own country and look at one of the victories won. This case seems of great importance since it flatly contradicts many claims by the opponents of the metric system. Let me quote from the American Bulletin of Commerce and Trade, Sept. 15, 1907: "About the first of the present year the Baldwin locomotive works secured an order for 20 locomotives from the Chemin de Fer d'Orleans with the understanding that the work was to be completed in six months. The work was completed on schedule time and the locomotives were shipped during the past month. * * * The railroad company supplied the mechanical drawings and these, of course, had all measurements indicated according to the metric system. There were 500 sheets of drawings with an almost countless number of measurements indicated. * * * Metric standards were purchased, metric gauges and templets were prepared and every workman who was to touch the job was given a jointed meter rule graduated to millimeters. It is an interesting fact * * * that not the least difficulty was experienced with the use of the new measure from the start and that during the entire work there was not an error made which was traceable to the change in systems."

The superintendent of the works makes the following interesting remarks on his experience: "It was a matter of short time delivery. The locomotives had to be done. We found that the men took to the metric system without any trouble at all. With them to use it once was to understand it. We found that the liability to make mistakes was less and that the decimal arrangement of the measures greatly facilitated the work." He also states that there would be no great loss to the manufacturers due to the change of the master dies, templets and the like and that, to use again his own words, "if the metric system were suddenly adopted, say next week, it would not disturb manufacturers to any appreciable extent. * * * Arguments which are advanced by those who oppose the system do not take into account shop practice."

A practical demonstration as this is indeed of much more value than all assertions of a hypothetical nature on either side. Let us hope that our manufacturers will have soon many more such lessons.

5. In conclusion your committee submits to you the following resolution with the request that if it is passed copies of the same be forwarded to the members of Congress from the State of Iowa, the Secretary of State, the Secretary of Commerce and Labor and to the members of the House Committee on Coinage, Weights and Measures:

RESOLUTION.

Whereas, The metric system possesses great advantages over the system now in common use and is being adopted more and more throughout the world, and

is used without difficulty, with facility and satisfaction in American shops upon foreign work,

Be it Resolved, That the Iowa Academy of Science again expresses its conviction that the exclusive use of this system for all public transactions is highly desirable, and

Be it Resolved, That Congress be urged to pass legislation looking towards the introduction of the metric system for general use in the United States at as early a date as possible.

Respectfully submitted,

K. E. GUTHE,
F. F. ALMY,
Committee.

REPORT OF COMMITTEE ON DEATH OF LORD KELVIN.

Lord Kelvin died Tuesday, December 17, 1907, at 83 years of age. At the time of his birth his father, James Thomson, was a farmer in the north of Ireland. After educating himself the father became a teacher of mathematics in the University of Glasgow, where William did his undergraduate work. At St. Peter's College, Cambridge, he graduated as Second Wrangler, thence to France, the Mecca of all mathematicians, where he worked with the famous Regnault.

At the age of 22 he was called to his native Glasgow to occupy the chair of Natural Philosophy, where he remained until 1890. In 1894 he became Chancellor. "The celebrations in '96 when he had spent 50 years in his professorship were perhaps the most memorable tributes ever paid to the scientific achievements of any one man and also the most singular testimony of the cohesion of men of science all over the world."

In Lord Kelvin there was the ideal three-fold process at work, brilliant theory, application of theory, and useful inventions. Helmholtz said he had "the gift of translating real fact into mathematical equations and vice versa," a much greater feat than the mere solution of set problems. He broke down the old dividing wall between mathematical and experimental physics thus making theory and practice an organic unit which is at once the glory and power of our basic science.

The speculative side of his nature found early expression in the controversy, then raging, between science and religion over the age of the solar system. His views on the constitution of matter, that famous old theory which supposes matter to be composed of indivisible vortex-rings, the parent of our modern electron theory, the nature of the ether and his theory of light, have been of most pregnant consequence to modern scientific thought.

On the practical side science is indebted to him for many useful discoveries and inventions. Those in connection with the Atlantic cable, for which he was knighted in 1866, being the most conspicuous. The mirror galvanometer, the siphon recorder, the quadrant electrometer, and the current balance are among the most important instruments in electrical measurement.

He was the proprietor of over fifty patents covering the familiar screw-down water tap, the mariner's compass, and the apparatus for recording and predicting tides.

As a teacher it is said that he often overestimated his audience. No one was more convinced than he that science is comprehensible measurable law for as he

said, "if you can measure that of which you are speaking and express it by a number, you know something of your subject, but if you cannot measure it by a number your knowledge is of a sorry kind and hardly satisfactory." He had little concern for merely literary conventions as many of his readers can testify. He was fearless and mentally honest and "never sold the truth to serve the hour." His writings have found place in the greatest scientific journals of the world. The Philosophical Magazine and the Proceedings of the Royal Society received constant contributions from his pen. Among his books may be mentioned "Molecular Dynamics and Wave Theory of Light, Treatise on Natural Philosophy, and his Baltimore Papers."

Lord Kelvin was a pre-eminently great man of science who deserved and won the highest honors, both English and foreign, that could be bestowed. His interment in Westminster Abbey is a fitting recognition of a most wonderful life.

Be it Therefore Resolved: That the members of the Iowa Academy of Science have noted with profound regret the death of Lord Kelvin. An ideal man of science whose life and achievements have united to give not only distinction but honor and quality to the work we love.

He died full of years but his death could at no time be less than a great loss to any nation.

Respectfully submitted,

D. W. MOREHOUSE,
MAURICE RICKER,
Committee.

REPORT OF COMMITTEE ON LIFE MEMBERSHIP AND PRIZES.

Your committee to whom was referred the matter of life membership and prizes for research work beg leave to report as follows:

LIFE MEMBERSHIP.

First. That the constitution be amended as follows: Insert after "necessary to election" in section 3, (4) Life members chosen from fellows.

Second. In section 4, after the words "his election," A person may become a life member on payment of \$7.00 after his election as a fellow, the transfer to be made by the treasurer.

Third. That said life membership fees be invested and only the interest of the same be used for current expenses of the Academy.

Prizes. That we recommend the awarding of an annual prize for meritorious scientific research work done in Iowa in the following sciences: Chemistry, Physics, Astronomy, Geology, Zoology or Botany. That the matter of arranging for the annual prize be left to the executive committee, except that not more than \$25.00 be appropriated for this purpose.

(Signed) L. H. PAMMEL,
M. F. AREY,
C. O. BATES.

REPORT OF COMMITTEE ON MEMBERSHIP.

NAMES PROPOSED FOR FELLOWS.

Guy West Wilson, Fayette; George F. Kay, Iowa City; A. G. Smith, Iowa City; transfer from member to fellow, C. E. Bartholomew, Ames.

NAMES PROPOSED FOR MEMBERS.

Henry McSweeney, Newgate; C. H. Anthony, Cedar Falls; C. A. Scott, Ames; C. L. Robinson, Norwalk; Mrs. A. D. Feuling, Ames; C. D. Learn, Clermont; R. E. Conklin, Des Moines; S. W. Hockett, Waterloo; L. D. Curtis, Alta; A. J. Wheat, Emmetsburg; G. G. Wheat, Emmetsburg; Miss Allison E. Aitchison, Cedar Falls.

DROPPED FROM THE LIST OF CORRESPONDING MEMBERS.

J. C. Brown, Gertrude Coburn, H. H. Hume, C. W. Mally, C. D. Read, W. M. Stull.

REPORT OF COMMITTEE ON RESOLUTIONS.

Resolved, That the Iowa Academy of Science expresses its approval of the policy of the Director of the Iowa State Bacteriological Laboratory in establishing branch laboratories; that we advocate the extension of this plan until all parts of the State are properly cared for, and that we consider an adequate legislative appropriation for the purpose as not only eminently proper but highly desirable.

Resolved, That the Iowa Academy of Science returns its thanks to the President and Faculty of the Iowa State Normal School for their courtesy in furnishing facilities for its meetings and in opening their homes to its members; to the local committee for well planned arrangements and to the young ladies of the department of Domestic Science for a very enjoyable demonstration of their abilities in preparing and serving a banquet.

E. W. ROCKWOOD,
H. E. SUMMERS,
E. A. JENNER,
Committee.

SPECIAL RESOLUTION.

WHEREAS, We have learned with deep regret that Mr. F. M. Witter, County Superintendent of Schools of Muscatine, Iowa, deems it necessary to withdraw from active participation in the work of the Academy; and

WHEREAS, Professor Witter, as one of the founders, as third President, as an indefatigable contributor to the Proceedings, and always as an enthusiastic member, exerted a notable influence in establishing the Academy on a firm foundation; therefore be it

Resolved, That the name of F. M. Witter be retained permanently on the roll of Fellows as long as he may continue a resident of Iowa; and be it further

Resolved, That the Secretary be instructed, in case of the removal of Mr. Witter from the State, to transfer his name to the list of Corresponding Fellows without further action by the Academy.

TREASURER'S REPORT.

RECEIPTS.

Cash on hand, April 26, 1907.....	\$264.07	
Dues and initiation fees.....	116.00	
Sale of Proceedings.....	3.50	
Interest on deposits.....	15.33	\$398.90

EXPENDITURES.

Programs and incidental expenses, 20th meeting.....	\$ 4.00	
Programs and incidental expenses 21st meeting.....	4.00	
Expenses of lectures, 21st meeting.....	70.16	
Binding, reprints, mailing, Proceedings of 20th meeting.....	71.00	
Postage, typewriting, and incidental expenses of Secretary, 1906-07	16.82	
Postage, typewriting, and incidental expenses of Secretary, 1907-08	29.09	
Honorarium to Secretary, 1907-08.....	25.00	
Postage for Treasurer.....	4.00	
Cash on hand, April 30, 1908.....	174.83	\$398.90

Respectfully submitted,

H. E. SUMMERS, Treasurer.

OFFICERS FOR THE YEAR 1908-09.

President.....	Samuel Calvin
First Vice President.....	F. F. Almy
Second Vice President.....	S. W. Beyer
Secretary.....	L. S. Ross
Treasurer.....	H. E. Summers

Executive Committee—Ex-officio: Samuel Calvin, F. F. Almy, S. W. Beyer, L. S. Ross, H. E. Summers. Elective: R. B. Wylie, L. Begeman, D. W. Morehouse.

NAMES OF MEMBERS OF THE ACADEMY COUNCIL.

M. F. Arey,	Maurice Ricker,	W. H. Norton,	E. W. Stanton,
T. H. McBride,	H. E. Summers,	S. W. Beyer,	G. L. Houser,
L. H. Pammel,	N. Knight,	B. Shimek	L. Begeman,
F. M. Witter,	A. A. Bennett,	G. E. Finch,	W. S. Hendrixson,
T. E. Savage,	H. W. Norris,	R. B. Wylie,	A. C. Page,
C. O. Bates,	L. S. Ross,	S. Calvin,	J. L. Tilton,
A. Marston,	F. F. Almy,	C. C. Nutting,	A. W. Martin.

NAMES OF FELLOWS AND MEMBERS PRESENT AT THE TWENTY-SECOND SESSION.

F. F. Almy,	E. A. Jenner,	E. K. Chapman,	G. W. Walters,
A. A. Bennett,	A. C. Page,	C. N. Kinney,	L. Begeman,
S. F. Hersey,	S. W. Stookey,	E. W. Rockwood,	K. E. Guthe,
C. C. Nutting,	B. H. Baily,	J. L. Tilton,	G. W. Newton,
A. G. Smith,	S. Calvin,	C. O. Bates,	B. Shimek,
Guy W. Wilson,	G. F. Kay,	G. E. Crawford,	G. G. Wheat.
M. F. Arey,	L. H. Pammel,	D. W. Morehouse,	
E. J. Cable,	C. E. Bartholomew,	L. S. Ross,	

PROGRAM OF THE IOWA ACADEMY OF SCIENCE.

The president's address by Professor John L. Tilton and the lecture on "Old and New Theories of the Formation of the Earth," by Professor Moulton, were given at the Auditorium Friday evening. Reception to members of the Academy at the residence of President Seerley, after the lecture.

Review of Solar Observations Made at Alta, Iowa, During the Past Five Years.... David E. Hadden

The Vitality of Weed Seeds Under Different Conditions of Treatment and a Study of Their Dormant Periods.....H. S. Fawcett

Some Seeds of the Genus Pyrus.....L. H. Pammel

The Genesis of the Loess, a Problem in Plant Ecology.....B. Shimek

A Hybrid Oak.....B. Shimek

Notes on Peronosporales for 1907.....Guy West Wilson

A Key to the Families of Ferns and Flowering Plants of Washington.....T. C. Frye

The Forestry Problem of the Prairies of the Middle West.....Hugh P. Baker

Notes on the Routine Diphtheria Determination in the Laboratory.....L. S. Ross

Isolation of Diphtheria Bacilli from Serous Fluid of a Cadaver.....L. S. Ross

The Uric Acid Ferments.....E. W. Rockwood

The Determination of Ferrous Iron.....Nicholas Knight

The Decomposition of Dolomite.....Nicholas Knight

The Analysis of Some Iowa Waters.....Nicholas Knight

The Life of Portland Cement.....G. G. Wheat

The Loess of the Paha and the River-Ridge.....B. Shimek

Some Peculiarities in the Elastic Properties of Certain Metals.....K. E. Guthe

An Experimental Determination of the Charge of an Electron by Wilson's Method, Using Radium.....L. Begeman

Nucleation According to Barus.....L. Begeman

Evaporation from Water Surfaces Exposed to the Sun.....A. G. Smith

The Protozoa of Fayette, Iowa.....Guy West Wilson

Exhibit of Photographs of Delicate Marine Animals Taken From Life in Sea Water	C. C. Nutting
A Study in Wing Veination, Family Aphididae.....	C. E. Bartholomew
Protective Adaptations in the Nesting Habits of Some Central American Birds.....	M. E. Peck
Revival of an Old Method of Brain Dissection.....	H. J. Hoeve
Physiographic Significance of the Mesa De Maya.....	C. R. Keyes
Tertiary Terranes of New Mexico.....	C. R. Keyes
Volcanic Phenomena About Citlaltepēt̄l and Popocatapetl.....	C. R. Keyes