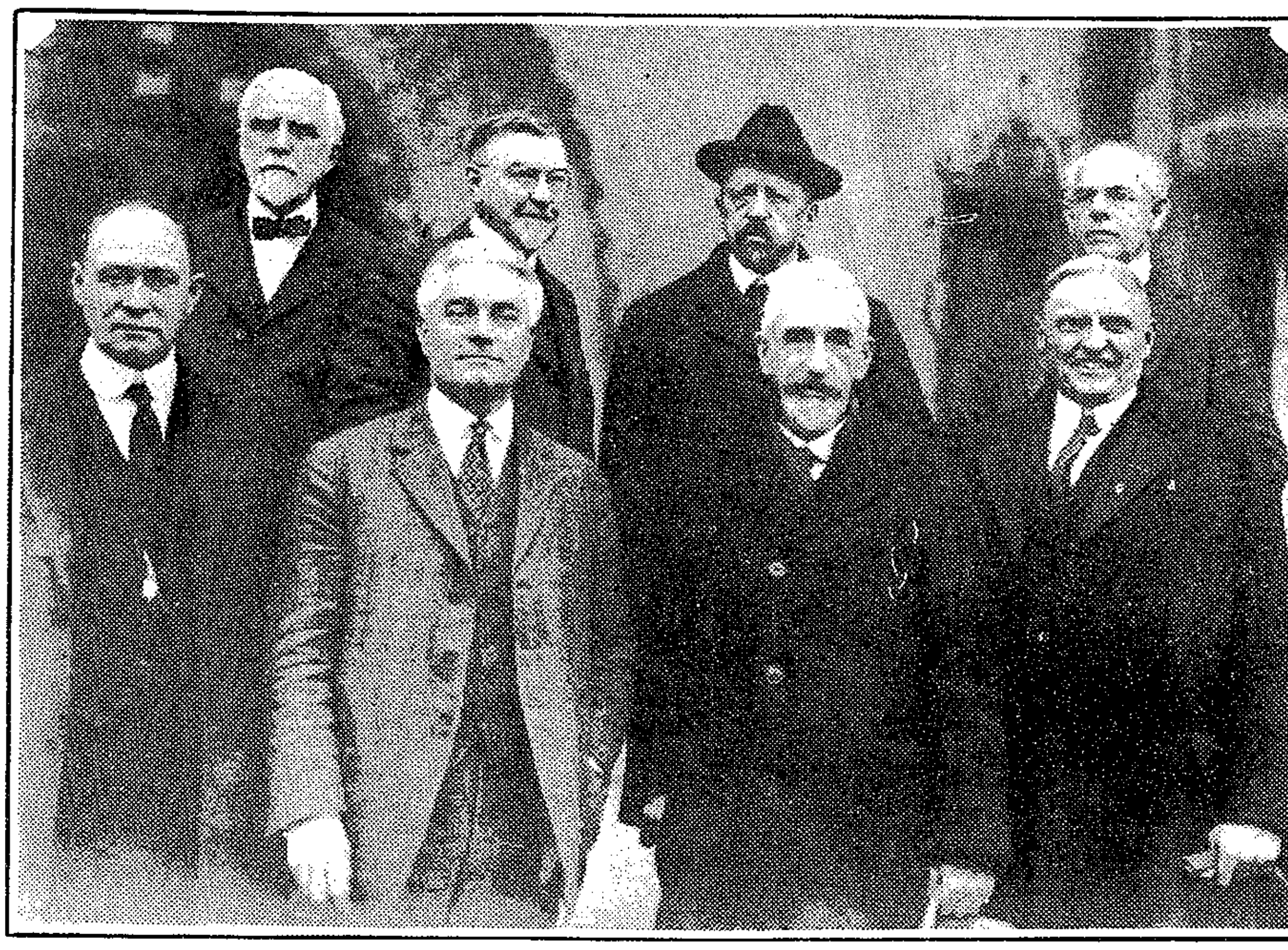
Current Events Unknown

Professor F. G. Crawford of Syracuse University gave one of his classes a quiz on current events and came to the conclusion that the average college student cares little for daily happenings. The questionnaire given was made up of names of prominent men and topics taken from the headlines of daily newspapers.

The average idea of who's who and what's what was low.

Some of the typical answers were:
Mussolini is an alcoholic rub.
Pinchot is a French interpreter in the United States.
Moratorium is a death notice in Germany.
Ghandi is Italian ambassador to Washington.
Freudism is a revolutionary party in Bavaria.

Members of Executive Committee at Convention



(Courtesy of Boston Traveler)
Among those assembled at Technology for meeting of the A. A. A. S. are: (bottom row, left to right) W. J. Humphreys, B. E. Livingston, J. P. McMurrich, H. B. Ward; (top row, left to right) H. L. Fairchild, D. T. MacDougal, L. O. Howard, J. M. Cattell.

DR. MOORE ADDRESSES THE OPENING SESSION

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of the British Scientific Association to beheld at Liverpool. He then introduced Dr. E. H. Moore of the Department of Mathematics of Chicago University, Retiring President of the A. A. A. S., who was the principal speaker of the evening. The title of the paper which Dr. McMurrich presented was "What Is a Number System?"

By way of introduction, the speaker gave first a word of greeting to Boston in view of the fact that at the meeting in Boston in 1847 of the American Association of Geologists and Naturalists the decision was made to found the American Association for the Advancement of Science, in which all branches of science were to be included, and then expressed the gratification of the men of science of today at the success achieved during the interesting three-quarters of a century by the Association in the fulfillment of its important function as representatives of American science in its Organic Unity.

Other Sciences Aid Math

Then addressing himself as a representative of pure mathematics, to the devotees of the natural sciences, Professor Moore raised the question of the distinction between mathematics and the natural sciences.

Mathematics is simpler and more self-contained than the other sciences. It has application in all the other sciences, in the physical sciences primarily, but by their mediation and by statistical methods in the biological sciences also. But it is not absolutely self-contained; in its development it constantly receives stimuli from non-mathematical sources, as in the case of Newton, who developed simultaneously the calculus and his theories of dynamics and gravitation, and on the other hand, the achievement of mathematics are subject to evaluation by their ultimate availability in the applications to other sciences, as in the case of many-dimensional non-Euclidean Geometry, long looked on as a plaything of the mathematician, and now a cornerstone in current speculation of the physicist.

Describes Notion of Number

Mathematics, simpler and more self-contained, and hence earlier developed, impressed itself profoundly on the other sciences by its ideal of mathematical rigor, and in this sense is perhaps the typical science, the fundamental science.

But the speaker was unable to accept the absolute separation of mathematics from the natural sciences on the ground of method, as expressed in the view commonly held that mathematics is deductive and the natural sciences are primarily inductive. To show how this view is contradicted by the history of mathematics, in response to the question "What is a Number System?" he undertook to give an impressionistic descriptive view of the development in history of the fundamental mathematical notion of number.

Study of Complex Numbers

After reading the familiar types of number,—the natural numbers, or integers; the natural fractions; the negative numbers and fractions; the real numbers, as represented on a graduated linear scale,—he sketched the extremely gradual development in history of these types of number. The Greeks accepted as numbers only the integers, and each new type had a long and strenuous struggle for existence. The numbers of each new type, initially recognized only to be rejected as no true numbers, were then tentatively accepted as symbols subject to rules of calculation already in use for numbers of the preceding types, and finally accepted definitively as valuable additions to the number system, only when it was recognized that by their use analysis, as the general theory of number was immeasurably richer in content, simpler in technique, and of far wider range of application.

These phases of the extension of the number system appear more clearly in the case of the imaginary or complex numbers, that is, numbers of the form $a+b\sqrt{-1}$, where a and b are real numbers. There is surely no real number, whose square is -1. The period of tentative systematic calculation with these complex numbers was initiated by Cardan in 1545 in his algebraic masterpiece, the "Ars Magna," and continued for 250 years. During the first century and a half the complex numbers played a modest role in alegbra and the theory of equations. Then, after the introduction of the calculus toward the close of the seventeenth century, they penetrated during the eighteenth century into the region of higher analysis. The complex numbers were understood only as mere symbols; current functions were functions of real variables; current analytic methods had been devised for application to functions of real variables. The whole movement was a gigantic extrapolation, inspired by the daring conviction of the investigators that some kind of valuable truth lay behind the mysterious -1. And thus the analysts of the eighteenth century were led to the discovery that important new relations connected the functions of complex variables, relations not present so long as the variables of the functions were required to be real.

Find Axiomatic Method

Finally, at the very end of the eighteenth ventury a real geometric interpretation of the complex numbers was determined, and the complex numbers were no longer imaginary; they were as real as the real numbers, only they were represented in the plane with two perpendicular graduated scales whereas the real numbers were represented upon the line with one graduated scale. Thus, as apart from the natural numbers or integers, the various types of number were fundamentally geometrical.

Continuing, the speaker sketched the critical movement of the nineteenth century. About 1870 the various types of number were discovered to be expressible, without the use of geometry, in terms of the integers alone. This fundamental advance as to the notion of number and the resulting logical rigor in analysis led to a similar advance in geometry. It is noteworthy that, whereas Euclid some 300 years before Christ realized that not all geometrical propositions can be proved, that the systematic building of the geometric edifice required the assumption as fundamental of certain unproved propositions or axioms, it was not until about forty years ago that Pasch insisted on the equally obvious fact that not all geometric terms can be defined, that the theory requires equally the assumption as fundamental of certain undefined terms. Thus, first in geometry and later in other branches of mathematics, we meet in its completeness the axiomatic, or better, postulational method. This recent contribution of mathematics to the methodology of science will undoubtedly be ultimately of fundamental importance in all branches of science.

Every branch of science, mathematics included, has its continually interplaying inductive and deductive phases. Mathematics, as simpler, more self-contained, and earlier developed, hopes to be of value to all the sister sciences not only in the development of specific results capable of wide application but also in the development of scientific methods capable of general scientific applicatoin.

Following Dr. McMurrich's address there was a general reception tendered by the Institute Corporation to the President and Retiring President of the Association, after which a buffet lunch, given by Mayor Curley and the City of Boston, was served.

The next general session of the Association will be held tomorrow evening at 8:45 o'clock in room 10-250. It will be the First Annual Sigma Xi Lecture. Dr. Livingston Ferrand, President of Cornell University, will speak on, "The Nation and Its Health." The public is invited.

OPENING SESSION OF ENTOMOLOGISTS HELD

Seven Zoological Papers Read at First Meeting Yesterday

The Entomological Society of America began its seventeenth annual meeting yesterday with its opening session in room 3-270. President Arthur Gibson, Dominion Entomologist of Canada, presided. The following papers were read:

"Notes on the Life History of Glastoptera obtusa and Lepyronia quadrangularis," by Philip Garman, Connecticut Agricultural Experiment Station.

"A New Type of Insect Metamorphoris Found in Termites," by Alfred Emerson, University of Pittsburg. Observation indicates that the workers develop from immature stages of the soldier caste, and consequently the soldiers are more nearly related to the fertile caste of these species.

"The Canadian Life Zone," by J. M. Aldrich, United States National Museum. Few species are characteristic of the Canadian Zone. It remains to show its connection with Scandinavia.

"The Distribution and Forms of Lygaeus Kalmii Stal," by H. M. Parshley, Smith College. There are two subspecies of this insect, occurring in western and eastern America respectively, and separated by a rather distinct line.

"The Malpighian Vessels of the Chrysomelidae," by W. C. Woods, Wesleyan University. These vessels show interesting differences of structure which may be arranged in an evolutionary series.

"The Occurrence of Muscina pascuorum in America," by C. W. Johnson, Boston Society of Natural History.

"The Male Genitalia and the Classification of the Genus Sphalerophoria (Diptera)," by C. L. Metcalf, University of Illinois.

A session for preliminary business, the appointment of committees, and of additional members to the Executive Committee followed the above program.