

information about the nervous system of the fly might be gained by recording the position of points inoculated by the spider and the point or points in the lantern at which the scintillations first appear, but the problem is one for a biologist rather than a physicist.

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THE FIRST ARTICLES ON GROUP THEORY PUBLISHED IN AMERICA

IN 1878 the first volume of the *American Journal of Mathematics* was published under the auspices of the Johns Hopkins University. This volume was edited by J. J. Sylvester (1814–1897) and contains two very short articles written by A. Cayley (1821–1895), who was then professor of mathematics at Cambridge University, England, and one of the most eminent mathematicians in the world. Each of these two articles covers less than three pages, and the former was largely embodied verbatim by its author in a longer article which appeared during the same year in the *Proceedings of the London Mathematical Society*. It contains the absurd statement that there are three groups of order 6, notwithstanding the fact that about twenty-four years earlier A. Cayley stated correctly that there are only two such groups, in the *Philosophical Magazine*, Volume 7, page 40 (1854).

The two articles by A. Cayley to which we called attention in the preceding paragraph seem to be the earliest articles on group theory published on the American Continent, but it is not true that the *American Journal of Mathematics* was the first mathematical journal founded on this continent, as stated by H. Weyl in his "The Classical Groups," page 27 (1939). The most conspicuous exception is *The Analyst*, founded at Des Moines, Iowa, in 1874, which appeared in ten volumes and was noted in the "Jahrbuch über die Fortschritte der Mathematik" for 1875 and later. It contains articles by G. W. Hill, S. Newcomb and other well-known mathematicians of that time and was the forerunner of the *Annals of Mathematics*, which is now published by the Princeton University Press.

The fact that no article on group theory was published in America before 1878 throws much light on the early history of mathematics in our country, since articles on this subject began to appear in Europe about one hundred years earlier and soon attracted

considerable attention on the part of various European mathematicians living in different countries. This interest was greatly stimulated by the work of N. H. Abel (1802–1829) and E. Galois (1811–1832), both of whom died early but attracted much attention by their tragic lives and fundamental discoveries at an early age. The work of these men was published in Europe about fifty years before work along similar lines was published in America and the latter work had actually been done by a European mathematician and was only published in our country. It took about ten years more until such work was both accomplished and published in this country.

At present important advances made in Europe soon attract attention in America so that the slowness with which American mathematicians entered upon the study of group theory is in striking contrast with present conditions and throws light on the isolation of early American mathematicians. Their interests were for a long time practically confined to the writing of elementary text-books which were frequently based largely on the European text-books which had been in great favor but confined themselves to the treatment of elementary mathematical subjects. About half a dozen mathematical periodicals were published in America before the *American Journal of Mathematics* was established, and some of them had contributors who resided abroad, but the *American Journal of Mathematics* was the first to publish articles by eminent mathematicians residing abroad.

Just as in the case of the first article on group theory published in America the first text-book on this subject to be thus published was written by a mathematician residing in Europe. This text-book appeared in 1892 under the title "Theory of Substitutions" and was a translation of a work by E. Netto. This was about twenty-two years after a similar work had appeared in Europe under the title "Traité des substitutions," by C. Jordan. Enough may have been said to show how the backwardness of the early mathematics in America is reflected in the history of one advanced subject and to emphasize once more the rapid forward strides made by American mathematicians in recent years. The developments in group theory represent some of the most conspicuous advances, especially in the central and the western parts of our country.

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SCIENTIFIC BOOKS

AN ANECDOTAL HISTORY OF ELECTRICITY
Sparks, Lightning, Cosmic Rays. By DAYTON C. MILLER. ix + 192 pp., 183 illustrations. The Macmillan Company, 1939, \$2.50.

THE author describes his book as an anecdotal history of electricity. It is based on the Christmas Week Lectures for young people by the Franklin Institute in December, 1937. Both the book and the lectures