MATHEMATICAL ASSOCIATION

ANNUAL GENERAL MEETING, 1952

THE annual general meeting of the Mathematical Association was held at the Polytechnic, Regent Street, London, during January 3 and 4, with the president, Dr. Mary L. Cartwright, Mistress of Girton College, Cambridge, in the chair.

In her presidential address, "Non-linear Vibrations: a Recent Chapter in Mathematical History", Dr. Cartwright described the development of work on those problems of applied mathematics which lead to non-linear differential equations, of the type which cannot be solved explicitly. Encountered by Poincaré in celestial mechanics, these equations came into greater prominence about 1920 with the work of van der Pol and Appleton on radio circuits; since then, radio engineering has increasingly demanded research on non-linear equations, particularly on the main problem of the existence of 'steady states', that is, of periodic or approximately periodic solutions. In the 1930's a Russian group of mathematicians, including particularly Kryloff and Bogoliuboff, developed very general methods of attack, not, however, very easily accessible to Western readers. Slightly later, Prof. J. E. Littlewood and Miss Cartwright in Great Britain and Prof. N. Levinson in the United States showed that topological arguments can be applied to the 'phase plane' of $(x, dx/dt)$ to enable inferences about the periodic solutions to be made. The whole field is scattered with unsolved problems which should provide material for research for many years to come.

It was in January 1902 that the Mathematical Association first appointed a Teaching Committee, and it was therefore fitting that much of the 1952 meeting should be devoted to matters which are dealt with for the Association by its Teaching Committee, such as the long series of "Reports", both on the teaching of special subjects, and on methods appropriate to special types of pupil. During the afternoon of January 3, a discussion on "The Association's Reports" was opened by Mr. J. T. Combridge, the present chairman of the Teaching Committee. Mr. Combridge described the gradual widening of the Association's interests so as to include on one hand increased correlation with university teaching, and on the other a deeper understanding of and interest in the teaching of mathematics in 'modern' and technical schools. Mr. A. W. Riley dealt in more detail with this latter aspect of the Association's plans, and Prof. T. A. A. Broadbent outlined the complementary functions of the Association's two main sets of publications, the Teaching Committee's Reports and the *Mathematical Gazette*. In the open discussion, many members pleaded for a new report in which school mathematics should be treated as a unified subject, not as a collection of separate topics.

The Association is proud to number among its still very active members two who served on the first Teaching Committee in 1902, Mr. A. W. Siddons and Mr. C. O. Tuckey. In an hour of reminiscences, Mr. Siddons told how in the early years of this century the plea of Prof. John Perry for a reform of mathematical teaching and the work of the British Association's committee on this topic prompted a letter from twenty-three schoolmasters, including Charles Godfrey and himself, urging the serious consideration of reforming projects, and thus causing the Association to set up a Teaching Committee, of which Mr. Siddons was the first secretary. Reports followed quickly, and the young committee won its first major triumph in procuring the overthrow of the tyranny of Euclid's "Elements" as the autocrat of school geometry. Prof. E. H. Neville followed Mr. Siddons, and described the ideas and personalities inspiring the Association's revolutionary report on the teaching of geometry (1923), with its now widely accepted division of school geometry into three stages, experimental, deductive, and systematizing. Mr. C. O. Tuckey, who was chairman of the Teaching Committee for many years, outlined the strenuous work, which, following the example set by the Geometry Report of 1923, produced a long series of subject reports, on arithmetic, algebra, mechanics, a second geometry report, and trigonometry, all now widely accepted as authoritative guides to the teaching of these subjects in grammar schools. The jubilee of the first Teaching Committee could be celebrated with pride in fifty years of severe but successful struggle for a reform of the teaching of mathematics in Great Britain.

On the morning of January 4, the first item was a discussion on the use and mode of teaching of vector methods, opened by Mr. K. Wardle and Mr. P. J. Wallis. Mr. R. H. Cobb then spoke on "Syncopated Geometry", describing how a calculus of functional symbols can be applied to the geometry of the triangle.

In the afternoon, a discussion took place on the recently published report of the Association on the teaching of calculus in schools, prepared by the Teaching Committee, under the chairmanship of Mr. K. S. Snell. Calculus is now taught in most schools, very often being begun in the fifth form, and is not confined to those pupils who are specializing in mathematics or natural science. Thus, in a first course, a variety of methods of approach must be available and must include one suitable for those pupils whose chief interest is on the side of the humanities. Mr. Snell described the ideas behind those chapters of the report which deal with the first course, and Dr. I. W. Busbridge then dealt with the more advanced chapters, which cover the whole range of the work in calculus likely to be done in schools by any but the ablest specialists. The aim of these later chapters is to keep the exposition as simple as possible, but yet to teach the pupil nothing which he or she will have to unlearn at a university. The idea of providing a firm bridge from the school course to the university course is in keeping with the Teaching Committee's recognition that the Association must increasingly co-ordinate its views with those of the universities. In the open discussion, some criticism of the omission of any reference to infinite series was made, but it was explained that the Association has in view a further report on sixth form analysis, in which this topic will more naturally find a place, as will other advanced matters such as the introduction of irrational numbers.

In the evening of January 4, Mr. A. W. Fuller gave a paper on "Some Measuring and Computing Devices of Interest to Teachers in Secondary Schools of all Kinds", of particular value now that the position of statistics as a school subject is receiving serious consideration.

The next annual general meeting of the Association will be held at Sheffield in April 1953. The president for the present year is Mr. K. S. Snell, of Harrow.