

MATHEMATICS

Chairman: J. C. POLLEY, Wabash College

Dr. L. H. Whitcraft, Ball State Teachers College, was elected chairman of the section for 1948.

ABSTRACTS

Pythagorean triangles. JOHN FUNDENBERG and G. A. JACKSON, Huntington College.—In a Euclidean plane an assemblage of points representing Pythagorean triangles was shown to consist of a parabolic lattice set and sets that were multiples of this set. A sub-set contained all primitive triangles. It was demonstrated that this assemblage of points could be located on systems of hyperbolas, circles, and straight lines. The approximate values of certain constants were shown to be obtained by the use of convergent or oscillatory series, of which the members were represented by points included in this assemblage.

The circle used as a base curve in the construction of certain curves studied in Analytic Geometry and Calculus. FLORENCE A. WIRSCHING, Purdue University.—The curves discussed included the conchoid, the cissoid, the cycloid, the epicycloid, and hypocycloid, the witch of Agnesi, the limaçon, and the lemniscate.

Some special sums of cotangents. H. F. S. JONAH, Purdue University.—A method was given for the summing of a certain finite sums of cotangents. The original sums arose in a research project in Electrical Engineering.

Mathematics teacher training in relation to the proper teaching of undergraduate Algebra. A. E. ROSS, University of Notre Dame.—A discussion was given of a fundamental approach to the teaching of algebra in college as well as the problem of training teachers to carry out such a program of instruction successfully.

A study of factors related to student progress in mathematics. PAUL IRICK, Purdue University.—The results of a study made at Purdue University were presented. The study showed the relation between grades in the first two years of college mathematics and such factors as: position in graduating class in high school, average grade in high school mathematics, number of units of high school mathematics, grades on tests given during orientation period.

A mathematical theory of religion. G. H. GRAVES, Purdue University.—Due to the studies of Whitehead, Russell, Keyser, and others, it is now generally accepted that pure mathematics has no particular subject matter, but is concerned with constructing logical systems on postulates suggested by any field of interest. Religion is a promising field in this connection for in religion we constantly observe conclusions,

decisions, and hence conduct and character, resulting from postulates held as convictions by an individual or by a society. Just as geometry has gained greatly in clearness and in range by a study of its foundations and by the recognition of the existence of incompatible systems which are individually consistent, so it may be expected that different religions can gain in clearness and tolerance by studying their fundamental postulates with a view to eliminating contradictions and non-essentials.

A reduced set of postulates for hyperbolic geometry. H. F. DEBAGGIS, University of Notre Dame.—A minimal set of postulates for hyperbolic geometry were presented. Independence examples were given for all the postulates.

The postulates of tri-operational algebra. F. L. BROWN, University of Notre Dame.—A minimal set of postulates for a tri-operational algebra was presented. The independence of the set was shown and a few elementary consequences were derived. (These consequences were among those published by the author in *Reports of a Mathematical Colloquium* Issues 5-6, 7, Notre Dame, Indiana.)

Geometric illustrations of abstract complexes. CHARLES BRUMFIEL, Ball State Teachers College.—Two and three dimensional examples of abstract topological complexes were given. The incidence matrices of an n -complex completely determine its topology. Methods were explained for calculating topological invariants, Betti numbers, and torsion coefficients by means of the incidence matrices.