The American Mathematical Monthly

ISSN: 0002-9890 (Print) 1930-0972 (Online) Journal homepage: https://maa.tandfonline.com/loi/uamm20

The Seventh Annual Meeting of the Indiana Section

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To cite this article: V. V. Latshaw (Acting Secretary) (1930) The Seventh Annual Meeting of the Indiana Section, The American Mathematical Monthly, 37:8, 395-398, DOI: 10.1080/00029890.1930.11987101

To link to this article: https://doi.org/10.1080/00029890.1930.11987101

which a number belongs, indices, primitive roots, etc.) can in a very simple and satisfactory manner be demonstrated by means of a square table which for a given fixed prime modulus gives both the residues of a^λ for λ fixed, a variable; and for a fixed, λ variable.

Some apparently new results will be presented on another occasion.

10. Professor Jackson's paper discussed applications of the geometrical interpretation of correlation coefficients less simple than those which are treated in papers published in recent volumes of the Monthly. In particular, it gave a geometrical derivation of the regression coefficients for a problem involving three statistical variables.

The members and friends of the association were guests of the University of Denver at a banquet on the evening of April 11. President Gorrell acted as toastmaster. The address of welcome was given by Chancellor Frederick Hunter of the University of Denver. The response was given by Professor A. J. Kempner of the University of Colorado.

Following this a very interesting and instructive address was given by the guest of honor, Professor Dunham Jackson, on "The significance of elementary mathematics in modern statistics."

A. J. LEWIS, *Secretary*

THE SEVENTH ANNUAL MEETING OF THE INDIANA SECTION

The seventh annual meeting of the Indiana section of the Mathematical Association of America was held on May 2–3, 1930 at Earlham College, Richmond, Indiana.

There were forty-five present at the meeting including the following twenty-three members of the Association: W. C. Arnold, R. W. Babcock, Gladys L. Banes, G. E. Carscallen, P. T. Copp, C. S. Doan, J. E. Dotterer, W. E. Edington, P. D. Edwards, E. D. Grant, G. H. Graves, H. E. H. Greenleaf, C. T. Hazard, D. F. Heath, Cora B. Hennel, Florence Long, Juna M. Lutz, T. E. Mason, J. A. Reising, C. K. Robbins, L. S. Shively, K. P. Williams, W. A. Zehring.

On Friday at 5:30 P.M. a reception was given to the visiting members and their guests. At 6:30 P.M. a complimentary banquet which was held in the dining room of the college was attended by sixty guests of the college. Professor E. D. Grant presided at the banquet and introduced President Denny of Earlham College, who made a brief address of welcome. Music was provided during the banquet by a trio of students of the college.

At eight o'clock a short pipe organ recital was presented in Stoddard Auditorium. The public lecture of the evening, under the auspices of Earlham College, was given by Professor Louis C. Karpinski of the University of Michigan

on the subject, "Mathematics and the Eternal Verities." Professor Karpinski pointed out that work and intensive intellectual application are the foundations of success not only in mathematics but in all the arts and sciences upon which the progress of civilization rests. In mathematics the student is inevitably confronted with these realities more than in any other subject of the school curriculum. Particularly for students who are likely ever to do creative work mathematics furnishes stimulus and inspiration. Even also for the great mass of students in our secondary schools mathematics is one of the few studies in which the fact of intellectual work or lack of work is made evident in every recitation. When this fact is combined with the fact that mathematics is the indispensable foundation for the study of engineering, economics, physics, and many other sciences, it becomes evident that mathematics must continue to hold a prominent place in our secondary school program.

At ten o'clock Saturday morning in Carpenter Hall the following officers were elected for the coming year: Chairman, P. D. Edwards, Ball State Teachers College; Vice-Chairman, G. E. Carscallen, Wabash College; Secretary-Treasurer, H. T. Davis, Indiana University.

A chairman's address in absentia by Professor Zinszer on "Sub-atomic Versus Interstellar Space," was read by Professor Grant. The first part of the paper consisted of a rapid review of the discoveries in the field of modern physics and their mathematical agencies. This included a brief description of Millikan's determination of the electronic radius, also Rutherford's determination of the approximate size of the nucleus of the gold atom. Following an exposition on the method of parallax and its application to astronomy, the paper took up a discussion of the galactic system and its dimensions.

The following seven papers were read:

1. "On non-composite plane curves of the form $C_6{:}8A^2B^2$," by Professor J. C. Polley, Wabash College, by invitation.

2. "Uses of vectors in geometry and trigonometry," by Professor R. W. Babcock, DePauw University.

3. "Number one and number naught," by Dr. A. F. Bentley, Paoli, Indiana, by invitation.

4. "Amount of training in mathematics required of high school teachers of mathematics in the various states," by Professor P. D. Edwards, Ball State Teachers College.

5. "Technique of instruction for large classes in mathematics," by Mr. C. E. Trueblood, Arsenal Technical Schools, Indianapolis, Indiana, by invitation.

6. "The predicted location of the 1930 center of population of the United States," by Professor L. S. Shively, Ball State Teachers College.

7. "The minimum essentials' place in mathematics courses," by Professor G. H. Graves, Purdue University.

Abstracts of these papers follow:

1. In this paper the author considers the web of sextic curves of the form $C_6{:}8A^2$, i.e., with eight double points. It is shown that: (1) on any non-composite

sextic C_6 of the web there are six points where a member of the pencil of cubics $C_3 - kC_3^1 = 0$ and C_6 have a common tangent and each point is a ninth double point on a non-composite web; (2) the locus of the ninth double point is a curve of order nine of the form $C_9{:}8A^3$.

2. Professor Babcock thinks that the concept of vector is within the grasp of the average pupil of geometry. Various problems involving intersections of lines of projections of lines may easily be solved by vector algebra. Several of the formulae of elementary trigonometry are easily derived by means of the scalar product. This work may be used for special projects for students who are possessed of intellectual curiosity.

3. Under Hilbertian technique, though not Hilbertian minimal presupposition, we may define a pure mathematics as any system of full consistency. Examining inductive numbers with the approach of Kronecker or Poincaré, rather than with the scaffoldings of Russell or of the Mengenlehre, we obtain a pure theory of number to which the distinctions of cardinal and ordinal are irrelavent. The cardinal is relegated to the "impure" or "foundation" regions of mathematics. Realistic and analytic (semantic) postulates for the investigation of Number One are constructed, and analysis is carried through by differentiation of operative zeros from realistic nulls, and by similar differentiation of infinities. A semantic number series and a semantic radix series are constructed. Under this construction proof is given that decimals are denumerable. The Cantorian proof of non-denumerability yields under analysis its realistic elements and fixations. Analysis of the ordinary form of proof that Null is a Zahl yields similar evidence of confusion between semantic symbol and realistic reference.

4. Practically all the states issue from two to a dozen different grades of high school certificates. The author discussed only the requirements for the certificates of highest grade. In most of the states a certificate of general validity for all subjects is granted. Consequently the teacher of high school mathematics may have studied no mathematics of college grade. In addition to a discussion of these requirements for the various states the author suggested some action on the part of college instructors of the state might improve the secondary teaching in Indiana.

5. During the past five or six years Mr. Trueblood has been experimenting with classes of a hundred students and finds that the results are satisfactory both from the standpoint of the teacher and the students. In this paper he outlined the method of conducting large classes and pointed out the special technique necessary.

6. Professor Shively predicted the location of the center of population of the United States basing his calculation upon estimates of population increase and of the distribution of population during the preceding decade. The results of the calculation, which was made as of January 1, 1930, are that the center has moved westward 13.2 miles and northward 2.8 miles with probable errors

of 1.25 and .84 miles respectively. This places it in N. Lat. 39°13′ and W. Long. 86°58′, a point a little to the southwest of Arney in Owen County, Indiana.

7. In this paper the author sketched a plan in use at Purdue University. The course is divided into a few heads and after the class periods allotted to each of these have been devoted to discussion, recitation, and illustrative examples as usual, a test is given which determines, with the class work, whether the student has "cleared his record" on that head. No grades are given during the course and only those who clear their record under all the heads by the end of the term receive credit for the course.

At the close of the meeting a resolution was adopted by the members expressing their appreciation to Earlham College and to the mathematics department for the splendid banquet and their efforts in making the meeting a success. Also the section expressed its appreciation to Professor Karpinski and Dr. Bentley.

V. V. LATSHAW, *Acting Secretary*

THE FOURTEENTH MEETING OF THE KENTUCKY SECTION

The fourteenth regular meeting of the Kentucky Section of the Mathematical Association of America was held at Transylvania College, Lexington, Kentucky, on Saturday, April 15, 1930. The Section was fortunate in having as its guest Professor W. D. Cairns, Secretary-Treasurer of the Association.

There were forty-three present, including the following twenty-one members of the Association: P. P. Boyd, W. D. Cairns, C. E. Caldwell, M. G. Carman, M. C. Dame, J. M. Davis, D. S. Dearman, A. R. Fehn, W. W. Garnett, Charles Hatfield, W. R. Hutcherson, C. G. Latimer, Elizabeth LeStourgeon, Mrs. A. R. Lyon, C. A. Maney, W. L. Moore, Smith Park, Sallie Pence, D. W. Pugsley, J. H. Simester, Guy Stevenson.

The chairman, Professor C. A. Maney, presided at both the morning and afternoon sessions. All present were guests of Transylvania College at luncheon.

The officers elected for the coming year were: Chairman, Professor J. M. Davis, University of Kentucky; Secretary, Professor A. R. Fehn, Centre College.

The program of the meeting was as follows:

Morning Session, 10:00 A.M.

1. "A certain identity in theta functions" by Mr. Smith Park, University of Kentucky and Eastern State Teachers' College.

2. "Trigonometric formulae by vector analysis" by Professor W. R. Hutcherson, Berea College.

3. "Mathematics—What's the use?" by Professor J. M. Davis, University of Kentucky.