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LOUIS CHARLES KARPINSKI, HISTORIAN OF MATHEMATICS AND CARTOGRAPHY

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Summary

Louis C. Karpinski was best known for his publications on the history of mathematics, and secondarily as a historian of cartography. This survey of his life includes an account of his contributions to the teaching of mathematics and of his avocational interests as a collector, chess player, and gadfly attacking what he saw as poor thinking and abuses of power in both the universities and in the public domain. It is followed by a note on archives, a list of the Ph.D. theses he supervised, and a complete bibliography.

1. EARLY LIFE AND EDUCATION

Louis C. Karpinski was born August 5th, 1878 in Rochester New York, and died in Winter Haven, Florida on January 25th, 1956. Both of his parents had come to this country as immigrants. Henry H. Karpinski had come from Warsaw, Poland via England at the age of 19. Louis' mother, Mary Louise Engesser, had emigrated from Gebweiler in Alsace. Henry Karpinski left his position with the Eastman Company in Rochester to take his family to Oswego, New York where he set up a cleaning and dyeing business which was later continued by his older son, Henry.

In 1894, Louis Karpinski graduated from high school in Oswego in the English and German curriculum. He received a Teacher's Diploma from Oswego State Normal School in 1897, and he began his teaching career, at the age of nineteen, in the schools of Southold, Long Island. In January 1898, he went to teach in the normal department of Berea College in Kentucky.

In 1899, Karpinski entered Cornell University where he played championship chess, having earlier won a state championship in 1896, and won honors in public speaking. The title of the oration for which he won a gold medal in the Cornell University Woodford Prize Contest of 1901 was "The Southern Mountaineer". This reflects his experience in Berea as well as a life-long concern for people and social-economic problems. In this same year he also earned both money and experience teaching in the private Cascadilla School in Ithaca.

Louis Karpinski completed his A.B. at Cornell in 1901 and in the same year enrolled in the American College of the Kaiser

Wilhelms-Universität zu Strassburg. In 1903, he was awarded the degree Dr. Phil. Nat. after submitting a number theoretic thesis (1) *(parenthetical numbers refer to the appended bibliography, bracketed numbers to the notes)* to a committee chaired by Heinrich Weber and including Theodore Reye and F. Braun.

2. WORK AND DEVELOPING INTERESTS

His occupations for the next few years reflect Karpinski's continuing interest in teaching and his somewhat tense, vigorous activity. In 1903-1904, he was in charge of physics and chemistry at Oswego State Normal College and of arithmetic in its practice school. Summers, he taught at New York University (1904) and the Chatauqua Institution at Chatauqua, New York (1905-1907). In 1904, he had accepted a position as instructor in mathematics at the University of Michigan, and in 1905 he married Grace Woods. He had met her at Cornell University where she had enrolled on a scholarship in 1899. The daughter of a county school superintendent in Lockport, New York, she taught physics, chemistry, Greek and Latin at a school in New Jersey for a year after graduating from Cornell in 1904.

The Karpinskis had six children, Robert Whitcomb, Mary, Louise, Ruth, Joseph Louis and Charles Elwin. They were active in community affairs and belonged to the Congregational church. Louis taught a publicly advertised bible class, "Studies in the Acts and Epistles" as one of the McMillan Hall Association Study courses, and served as the piano accompanist for choral groups on the strength of the year of lessons which he had received at the age of sixteen. He also gave a lecture on the history of arithmetic as a part of the University's summer program of lectures and entertainment.

In 1906, 1907, and 1908 he returned to New York State to lecture in the teachers' institutes which were commonly scheduled at the beginning of school each fall.

3. DEVELOPMENT AS A HISTORIAN

In spite of the fact that at various times Louis had anemia, diabetes, and heart trouble, he was always active professionally as well as in church, community, and political affairs. In the University he progressed to a full professorship in 1919, and to professor emeritus upon his retirement in 1948. However, his professional career was strongly redirected by the year which he spent (1909-1910) as a Teachers College Fellow and Extension Lecturer at Teachers College, Columbia University. He had been encouraged in historical interests by his department chairman, W. W. Beman, who himself had written historical papers as well as secondary school texts. Interest in the history of mathematics at the University of Michigan was further heightened by the presence of Alexander Ziwet (81), Chairman of the Department of Mathematics of the College of

Engineering. Ziwet, who also was trained abroad, had a wide interest in mathematical literature, a large and fine personal library, which he eventually gave to the University (64), and had also published historical articles. However, the most direct influence on Karpinski was that of David Eugene Smith with whom he worked at Teachers College. Although they were later rivals in a friendly sense, at least so far as Karpinski was concerned, their joint publication *The Hindu Arabic Numerals* (12) was Karpinski's first book and is still one of the basic references on this subject.

4. KARPINSKI AS A BIBLIOGRAPHER

The rivalry with David Eugene Smith and Columbia University, at least in the mind of Karpinski, developed after he returned to the University of Michigan and began to build there a collection of source materials in the history of mathematics. He did this by badgering librarians and alumni for funds as he scanned book catalogues and traveled to visit dealers and auctions. In later years he would say,"I always said Michigan had the better collection - even when it didn't". This statement was made especially with respect to Columbia's collection which later became the Smith-Plimpton Collection, when two bibliophiles gave their private collections to Columbia University. However, he was also aware of the collection at Brown University built up through the efforts of R. C. Archibald. It is hard to know which was his more basic urge, that of the collector, or that of the competitor. In either case, he competed as a collector to the advantage of the University of Michigan and of the history of mathematics and cartography.

Professor Karpinski's scholarly contributions as a bibliographer were a natural concomitant of his collecting urge. His *Bibliography of Mathematical Works Printed in America through 1850* (110) with the several supplements published in *Scripta Mathematica* (111, 113, 118) is commonly cited merely as "Karpinski" by dealers in Americana, and has been a basic reference for studies of the early history of mathematics in America. He also published bibliographies of early algebraic (112) and trigonometric (114) works. This interest appears also in his cartographic work, where his *Bibliography of the Printed Maps of Michigan, 1804-1880* (130) is still authoritative. Bibliographies are, of course, essential to scholarly work, particularly to historical work. They become tools for future scholars and are themselves a scholarly product, not merely appendages to papers. Karpinski's influence and indirect products are also to be observed in the theses of his students [1], some of which included bibliographies as essential parts of the body of their research. Items 69, 71, 73, 74, 101 and 116 of the list of his publications show his interest in early American arithmetic. Items 121, 126, 128 are bibliographies relating to cartography,

and 158 deals with early military publications. This latter was done in collaboration with Colonel Thomas M. Spaulding, who also gave the University of Michigan many rare mathematical works.

5. RESEARCH IN THE HISTORY OF MATHEMATICS

Returning to Louis Karpinski's major interest in the history of mathematics, we find his initial work with the Hindu Arabic numerals being extended to include early European algorisms (13, 21, 22, 31, 59, 79, 82, 83, 89, 100, 103) and algebraic manuscripts (14, 15, 20, 23, 24, 32, 41, 83).

The often-cited book *Robert of Chester's Latin Translation of the Algebra of Al-Khowarizmi* (41) was the culmination of his work in the latter area. It also typifies his interest in original sources and manuscripts, which was served by trips to European libraries and depositories.

A survey of his publications on algorisms also suggests the fruitfulness of his contacts with historians and scholars in other fields. These were sometimes represented by joint publications and sometimes by acknowledgements, prefaces, or addenda in articles listed under other names. In addition to David Eugene Smith and Thomas Spaulding we can list Karpinski's son-in-law, Charles N. Staubach (100), and E. G. R. Waters (79), a romance language specialist at Oxford, with both of whom he worked on algorisms, and his colleagues Martin Luther D'Ooge and Frank Egleston Robbins of the Greek Department with whom he shared in the production of a translation and commentary on Nichomachus of Gerasa's *Introduction to Arithmetic* (75). Arthur S. Aiton (159) was a colleague in the History Department; Adelaide M. Fiedler (68) was a student. Harry Y. Benedict and John W. Calhoun (53) were colleagues at other schools, and Charles Bache (149) was a descendant of Benjamin Franklin. In discussing the difficulties of translating mediaeval Latin manuscripts Professor Karpinski mentioned, orally, that his wife's background in this language had been an aid in his work on the Robert of Chester manuscript (15, 41).

6. THE HISTORY OF CARTOGRAPHY

The challenge of collecting, love for scholarship and source materials, and his large family, motivated several other Karpinski activities and publications. He conceived the project of photographing source materials for American history, especially manuscript maps in libraries and archives in France, Spain and Portugal. During a sabbatical year, 1926-27, he photographed over 650 maps, many from the sixteenth and seventeenth century. In the process he was able to secure assistance in overcoming bureaucratic and military red-tape and opposition from the Duke of Alba, in Spain, and Paul Painlevé, a French mathematician who was then Minister of War and later became Premier. These difficulties and the rumour that such photographic privileges might be denied to others in the future made

his collection of photographs even more valuable. It was purchased in whole or part by a number of American libraries. The collection in the William L. Clements Library of American History at the University of Michigan contains 773 photographs occupying fourteen large volumes.

However, Professor Karpinski's most scholarly and authoritative cartographical work is represented by the two volumes commissioned by the Historical Commission of the State of Michigan, and published by them in 1931, *Bibliography of the Printed Maps of Michigan 1804-1880* (130) and *Historical Atlas of the Great Lakes and Michigan to Accompany the Bibliography of the Printed Maps of Michigan* (131). A number of additional cartographic papers are noted in the bibliography.

7. ENTREPRENEUR AND COLLECTOR

Louis Karpinski's entrepreneurial tendencies were suggested in the previous section where we noted his combining of a service to scholarship and history with a commercial program, selling photographs of maps to libraries. The proceeds from these sales, the sale of his own collection of maps and atlases, and the income from occasional articles for magazines and newspapers supplemented the income of a college professor who not only liked to travel himself, but who also wished to take his large family abroad. Between 1921 and 1928, he published nearly sixty articles in the *Dearborn Independent* (148), a weekly newspaper owned by Henry Ford and edited by W. J. Cameron, who became a friend and traveling companion to the Karpinskis.

In the early 1930's, he sold the Karpinski Collection of maps to Yale University for a substantial sum to be paid over a period of years. The collection, which is estimated to have contained nearly a thousand items, is currently being combined with Yale's von Wieser Collection of Maps and Atlases to form the basis of the Thorne Collection of Cartography and Geography in Yale University's Beinecke Library.

After his retirement, Professor Karpinski continued to combine business with pleasure. He bought atlases and books in varied fields from dealers and at auctions, loaded them in his car, and called at many libraries to help them improve their holdings and to introduce famous rarities into collections at small colleges.

As a text writer, he produced three books, an integrated text for a freshman course (53), a table of logarithms (52), and his *History of Arithmetic* (73). The first book was an excellent example of a type of text which never "caught on". The book was an integrated treatment of college algebra, functions, including trigonometric functions, and analytic geometry. It stressed the idea of a function, graphs, and applications. In the opinion of this writer it is still in many ways ahead of its time! It did appear in a second edition and in a Russian

translation. It is interesting to note that the *History of Arithmetic* has recently been reprinted after many years of being out of print.

8. OTHER SERVICES TO THE HISTORY OF MATHEMATICS

Professor Karpinski served the history of mathematics and science in a variety of roles in addition to that of researcher and bibliographer. In particular, he was an expositor and transmitter of new historical developments to those with less time, expertise, or contact with the field. This was done via radio talks, speeches at teachers' conventions, expository articles and reviews. He was, for example, the invited speaker at the first organizational meeting of the Mathematical Association of America at Cleveland, Ohio, in December 1915. The records of that meeting show that he gave an *illustrated* lecture on "The Story of Algebra". The records do not show the nature of the illustrations but one can conjecture that he used either an opaque projector or slides. His interest in photography and slides dates back at least to his time at Columbia University, because his correspondence with David Eugene Smith shows that he borrowed slides to show in Michigan after his return from New York. In 1931, he was the designer of the four series of slides depicting the history of arithmetic, algebra, geometry, and higher mathematics which were automatically projected on the four sides of a central column of the area devoted to mathematics in the Hall of Science at the Century of Progress Exposition (world's fair) in Chicago, in 1932.

The appended bibliography of Karpinski's publications includes his reviews because often they were extended, including corrections, additional data, and sources so as to be scholarly expositions in their own right. The critical side of his nature and his continuing concern for the pedagogy of mathematics showed up most often in his reviews of texts and of books intended for teacher education. He was sharply critical of "educators" when he felt they were superficial in their thinking or scholarship (78, 150, 151), but he gave substantial praise to others (35, 58, 77). One review of a book on the teaching of mathematics concluded with "where it was new it was not right, and where it was right it was not new"! (51)

He regularly taught professionalized subject matter courses in algebra and geometry for secondary school teachers as well as courses in the history of arithmetic and algebra, geometry and trigonometry, and the history of the calculus. His doctoral students and their theses titles are listed in note [1].

He served as an associate editor of *Scripta Mathematica* from its founding in 1932 until his death, and was active in a variety of organizations. We noted earlier his presence at the organizational meeting of the Mathematical Association of America. He was its Librarian 1921-22, and in 1924 he gave a paper, "Early American Arithmetics", at the first meeting of the Michigan Section [2].

9. MEMBERSHIPS, OFFICES, HONORS

In addition to the usual memberships of a professional mathematician and historian (American Mathematical Society, Mathematical Association of America, Deutsche Mathematiker Vereinigung) he belonged to such pedagogically oriented organizations as the National Education Association, Central Association of Science and Mathematics Teachers, Michigan Schoolmasters Club, and the Michigan Academy of Science, Arts, and Letters. He was active in the History of Science Society, being a member of its council in 1926-28, 1934, 1940, vice-president in 1936-39, and president in 1943. In the American Association for the Advancement of Science he was a vice-president and chairman of Section L, the Historical and Philological Sciences in 1923-24 and 1938-39.

He was a member of Sigma Xi and Membre Effectif #14 of the Comité Internationale d'Histoire des Sciences. In 1932, he was one of the members of the Michigan George Washington Bicentennial Commission, and in 1937 President Franklin D. Roosevelt appointed him, G. D. Birkhoff, and Arnold Dresden as the United States delegation to the Descartes Tercentenary in Paris. His talk at that event was later printed in *Science* (107).

10. MISCELLANEOUS INTERESTS AND ACTIVITIES

As has been suggested earlier, Louis Karpinski was a bit of a gadfly, an activist somewhat ahead of his time. In faculty meetings and committees he proposed faculty representation on the Board of Regents and attacked the private practices and fees of professors in the medical school. He toured southern colleges speaking for the newly developed T.I.A.A. (Teachers Insurance and Annuity Association) program. In later years he attacked the rates and rate setting procedures of public utilities in hearings and in the press. He listed himself in the 1948 *Who's Who* as an expert on utility rates as well as a mathematician and historian of science.

In 1947 when Beardsley Ruml was to address the prestigious Detroit Economic Club on his proposed subsidies to older citizens, Karpinski personally distributed to the audience pamphlets which he had written analyzing and opposing the "Ruml Plan". His stands and attacks were not always moderate and in at least one instance led to hard feelings. Professor Karpinski attended the meeting of the American Council of Learned Societies as president of the History of Science Society. At these sessions he strongly objected to a report on modern language teaching, and proposed a resolution that professional persons called upon to give expert testimony or advice to Congress or other government agencies should be required to make a declaration of all their commercial connections with groups interested in the subject on which they were to give testimony or advice (161). Other officers of the History of Science Society felt that

Karpinski had given the impression that the views he had expressed were those of the Society. After some bitter correspondence, Karpinski resigned as president.

As another evidence of the modernity of some of his outlooks, one can note that he introduced a resolution favoring the metric system into the 1920 joint meeting of the American Mathematics Society, the Mathematical Association of America, and the American Association for the Advancement of Science.

Perhaps the best ending for this section is the self-description in his annual faculty report for 1938: "Democrat, reformed Republican".

11. CONCLUSION

It is impossible to estimate the ultimate effect of Louis Karpinski's life and work. It has been spread by the enthusiasm and teaching of the many young people who passed through his classes and by the scholars who read his work and were motivated and directed by it. Some undergraduates had to grow in maturity to appreciate the prodding of his impatience with those who, for lack of effort or insight, could not reply to a question, and to recognize the excitement and uniqueness of exposure to his broad historical information and insight. In later years they returned and wrote to express their thanks for facts and interests which had grown in utility and pleasure over the years.

Editors and proofreaders found that the mass of materials which he collected from wide-ranging searches brought with it much work for them. However, hundreds of students recalled him, his courses, and his counseling with enthusiasm for many years. Later generations of historians are still benefitting from his work.

ARCHIVAL NOTES

There are pictures, a number of boxes of letter, reprints, and information about Professor Karpinski in the Bentley Library of the Michigan Historical Collections at the University of Michigan. A picture of him as vice-president of the A.A.A.S. is in *The Scientific Monthly*, vol. 50, p.90.

ACKNOWLEDGEMENTS

It is a source of regret that Mary Karpinski Casey's death came only a few days before she could have read the final draft of this story. Her assistance with anecdotes, family materials, and comments on an earlier draft were enthusiastic and helpful. Facts and impressions were also given by Professor Warner G. Rice, who is a former Director of the University of Michigan Library and who was a neighbor of the Karpinskis, by Professor Howard H. Peckham, Director of the William L. Clements Library,

and by the Curator of Maps, Alexander Vietor, and the staff of the Yale University Library.

NOTES

1. Louis C. Karpinski's doctoral students and their dissertations, in chronological order, were:

Susan Rose Benedict, *A Comparative Study of the Early Treatises Introducing into Europe the Hindu Art of Reckoning,* 1914. Concord, N.H.: The Rumford Press, 1916. vi + 126 pp.

Irby Coghill Nichols, *A Comparative Study of Fractions of the Early Treatises on the Hindu Art of Reckoning,* 1916.

John David Bond, *The Development of Trigonometric Methods Down to the Close of the XVth Century,* 1920. This dealt largely with Richard Wallingford's *Quadripartitum* and was printed in *Isis* in parts as follows: 3 (1921), 215-323; 4 (1921-22), 313-314; 5 (1922-23), 99-115 , 339-363.

Franklin Wesley Kokomoor, *The Teaching of Elementary Geometry in the Seventeenth Century,* 1926. *Isis* 10 (1928), 21-32, 367-415; 11 (1928),85-110.

Sister Mary Leontius Schulte, *Additions in Arithmetic, 1483-1700, to the Sources of Cajori's "History of Mathematical Notations" and Tropfke's "Geschichte der Elemantar-Mathematik",* 1934. Ann Arbor, Michigan: Edwards Brothers, Inc., 1935. x + 99 pp.

Sister Mary Thomas à Kempis Kloyda, *Linear and Quadratic Equations, 1550-1660,* 1935. Ann Arbor, Michigan: Edwards Brothers, Inc., 1938. xii + 141 pp.

Sister Mary Claudia Zeller, *The Development of Trigonometry from Regiomontanus to Pitiscus,* 1944. Ann Arbor, Michigan: Edwards Brothers Inc., 1946. vi + 119 pp.

Phillip Sanford Jones, *The Development of the Mathematical Theory of Perspective and its Connections with Projective and Descriptive Geometry with Especial Emphasis on the Contributions of Brook Taylor,* 1947.

2. Carl B. Boyer, "The First Twenty-Five Years", *The Mathematical Association of America: Its First Fifty Years,* 1972. Published by the M.A.A.; edited by Kenneth O. May. See also the six index entries under Karpinski in this publication.

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NOTE: *All publications are arranged chronologically in each of three categories: mathematics, cartography, and miscellaneous.*

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7. Finger Reckoning *American Education* 12(1908-1909), 449-450
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9. Review of Florian Cajori *A History of the Logarithmic Slide Rule and Allied Instruments,* in *Science* 32(1910), 666-668
10. Jordanus Nemorarius and John of Halifax *Amer. Math. Mon.* 17(1910), 108-113
11. Number *Amer. Math. Mon.* 18(1911), 97-102
12. *The Hindu-Arabic Numberals* (with David Eugene Smith) 1911 Boston (Ginn and Company) vi + 160 pp.
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14. An Italian Algebra of the Fifteenth Century *ibid.*, 209-219
15. Robert of Chester's Translation of the Algebra of Al Khowarizmi *ibid.*, 125-131
16. The Hindu-Arabic Numerals *Science* 35(1912), 969-970
17. Mathematics Chapter VI in Charles Hughes Johnson *High School Education* 1912 New York (Scribner's), 128-145
18. Augrim Stones *Modern Language Notes* 27(1912), 206-209
19. The History of Mathematics in the Recent Edition of the Encyclopaedia Britannica *Science* 35(1912), 29-31
20. The Algebra of Abu Kamil Shojá, ben Aslam *Bib. Math.* (3)12(1912), 40-55
21. Hindu Numerals Among the Arabs *Bib. Math.* (3)13(1913), 97-98
22. The "Quadripartitum Numerorum" of John of Meurs *ibid.*, 99-114
23. The Algebra of Robert Recorde, The Whetstone of Witte *ibid.*, 223-228
24. John Caswell *ibid.*, 248-249
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26. Simplified Arithmetic *The American Boy* (Nov. 1913)
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29. Review of E. H. Barker, *Computing Tables and Mathematical Formulas Arranged for the Use of High Schools and Colleges ibid.*, 282

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36. Review of Mikami, *The Development of Mathematics in China and Japan* in *Science* 40(1914), 676-677
37. Review of D. E. Smith, *The Teaching of Arithmetic* and A. W. Stamper, *The Teaching of Arithmetic* in *Amer. Math. Mon.* 21(1914), 85-86
38. Review of W. B. Ford and Charles Ammerman, *Plane and Solid Geometry* in *Michigan Alumnus* 20(Feb. 1914), 283
39. Arithmetic for the Lumberman *Amer. Lumberman* (April 25, 1914), 52-53
40. How to Compute Interest *American Boy* (Mar. 1914)
41. *Robert of Chester's Latin Translation of the Algebra of Al-Khowarizmi*, with an Introduction, Critical Notes and an English Version. University of Michigan Studies, Humanistic Series, volume XI, and New York (Macmillan) 1915 vii + 164 p. 4 plates
42. A Rule to Square Numbers Mentally *School Sci. and Math.* 15(1915), 20-21
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47. Arithmetic for the Farm *The Educator Journal* 16(1915), 132-135
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CSHPM/SCHPM

The Canadian Society for History and Philosophy of Mathematics/Société canadienne d'histoire et de philosophie des mathématiques will meet at Université Laval (Quebec City) on 4 June 1976. An invited address will be presented by Prof. Asger Aaboe (Yale) entitled "The scientific foundations of ancient and medieval cosmology," followed by several sessions of contributed papers. There will also be an annual meeting and election of officers.

A directory of members of the Society is being prepared and will be distributed in the near future. There will be an increase in the subscription rate for *HM* to members from $6 to $8, beginning in 1977 (volume 4). There will be no increase in dues ($4). Persons interested in joining the Society should contact the Secretary, Charles V. Jones, Department of Computer Science and Mathematics, Atkinson College, York University, Downsview, Ontario, M3J 2R7.