$$\pi \left| P(x, r) - L \right| \leqq \epsilon \int_0^\delta \varphi_r(\alpha) d\alpha$$

$$+ \varphi_r(\delta) \cdot \left| \int_\delta^{X_r} \left[\frac{f(x + \alpha) + f(x - \alpha)}{2} - L \right] d\alpha \right|,$$

where $\delta \leqq X_r \leqq \pi$,

$$< \epsilon\pi + \varphi_r(\delta)G,^*$$

for $0 < r < 1$,

$$< \epsilon\pi + \frac{(1 - r^2)K}{\sin^2 \frac{1}{2}\delta}$$

where G and K are positive constants,

$$< \epsilon',$$

for r close enough to unity.   Hence $\lim\limits_{r \to 1} P(x, r) = L$.

W. W. KÜSTERMANN.

ANN ARBOR,
    May 2, 1914.

THE NAPIER TERCENTENARY CELEBRATION.

THE Napier Tercentenary Celebration was held at Edinburgh on July 24–28, 1914, with over three hundred visitors present. The ceremonies opened at the University of Edinburgh under the presidency of the Lord Provost of the city, the address of the day being delivered by Lord Moulton and relating to the probable reasons in Napier's mind for deciding upon a table of logarithms of sines and to his probable methods of computing.   Brief addresses were given by four of the official delegates, Professors Andoyer and D'Ocagne of Paris, Smith of New York, and Bauschinger of Strassburg.

On Saturday morning the first session was held under the presidency of Professor Hobson of Cambridge.   The following papers were presented:

DR. J. W. L. GLAISHER, of Cambridge: "The work of Napier."

Dr. Glaisher called attention to the paucity of notations

---

* The argument here is based on the fact that a definite integral is a continuous function of its upper limit and as such has a finite maximum and minimum. Cf. E. H. Moore, *Transactions*, vol. 2, pp. 296 and 459.

and general symbols three hundred years ago to aid in the forming of clear conceptions of the nature of logarithms, and stated that an examination of Napier's work impressed one with his greatness as a genuine mathematical thinker rather than as the discoverer of an isolated detail.

DR. G. VACCA, of Rome: "The first Napierian logarithm before Napier."

In the absence of the author of the paper, Dr. Knott gave a brief summary. Dr. Vacca believes that a certain passage in Pacioli (1494), in relation to the computation of interest, has in it the essence of a logarithm. The rule given by Pacioli is substantially this: Divide 72 by the rate of interest and the quotient is the required number of years that it takes a sum to double itself at compound interest. Dr. Vacca shows that this number 72 is approximately 100 log 2 in Napier's system.

PROFESSOR G. A. GIBSON, of Glasgow: "On the transition from Napier's to Briggs's logarithms."

Professor Gibson showed that the improvement suggested by Briggs in his talk with Napier was not what we commonly look upon as the Briggs logarithms. He asserted that it was Napier himself who first suggested making log 1 equal to zero.

PROFESSOR D. E. SMITH, of New York: "Laws of exponents in the works of the sixteenth century."

In this paper was discussed the gradual rise of the laws of exponents in the sixteenth century, the statements being based upon extracts from the original works of various writers. It was the author's purpose to show that the fundamental laws of logarithms were well known as applied to integral exponents, and that Bürgi was led by them to prepare his Progress Tabulen (1620). The chief purpose, however, was to bring together for the use of students the actual words of the leading sixteenth century writers relating to the subject.

LIEUTENANT SALIH MOURAD, of Constantinople: "On the introduction of logarithms into Turkey."

Lieutenant Mourad showed that Ismail Effendi (Caliph Zade) introduced logarithms into Turkey exactly one hundred years after Napier's first publication of 1614.

PROFESSOR F. CAJORI, of Colorado Springs: "Algebra in Napier's day, and alleged prior inventions of logarithms."

The paper considered the claims presented by certain writers that Regiomontanus, Wright, and Bürgi, or some one of them, had anticipated Napier in the invention of logarithms. Professor Cajori weighed the evidence in a judicial manner and showed that there was nothing to substantiate a claim to priority on the part of any of these writers.

DR. D. M. Y. SOMMERVILLE, of St. Andrews: "On Napier's rules and trigonometrically equivalent polygons, with extension to non-euclidean space."

The second meeting was held on Monday, July 27, under the presidency of Professor D. E. Smith of New York, Dr. J. W. L. Glaisher of Cambridge, and Major P. A. MacMahon of London, who served during three sessions in the order named.   The following papers were read:

PROFESSOR H. ANDOYER, of Paris: "On the history and method of construction of tables."

Professor Andoyer explained the construction of his recent (1911) tables which contain the logarithms of the trigonometric functions to seventeen significant figures for every hundredth of the quadrant, and to fourteen figures for every ten seconds.   He also mentioned a work upon which he is now engaged, the calculation of a table of natural sines to fifteen significant figures, a work which he expects to finish in about two years.

PROFESSOR M. D'OCAGNE: "Communications relating to the history of calculating machines and to the development of nomography."

He stated that the principle of the Millionaire calculating machine was the invention (1893) of a young French mechanician, Léon Bollée, and that the earliest systematic application of nomograms is found in Margett's Longitude Tables of 1791.

MRS. EMMA GIFFORD, of Chard, Somerset: "On a recent table of sines."

Mrs. Gifford described her method of computing and checking her recent table of natural sines, which gives the sine for every second of the quadrant.

DR. J. R. MILNE, of Edinburgh: "On the arrangement of tables."

This paper was illustrated by lantern slides, and the questions of type, workmanship, paper, and general arrangement were discussed.

MR. H. S. GAY, of Shamokin, Pa.: "On a convenient formula for determining the angle, given the sine or cosine."

Mr. Gay presented a formula which easily gives an angle to a sufficiently close degree of approximation for practical purposes, when the cosine or sine is known.

MR. J. C. FERGUSSON, of Birmingham: "On the percentage unit of measuring angles."

The essential feature is the use of the tangent instead of the angle, and of the octant instead of the quadrant.

MR. W. SCHOOLING, of London: "On the calculation of logarithms."

The speaker showed how the logarithms of numbers, the logarithms of their reciprocals, and the gaussian logarithms, can be calculated by pure addition.

DR. A. HUTCHINSON, of Cambridge: "On graphic methods and on the use of the slide rule in crystallography."

DR. W. F. SHEPPARD, of Sutton: "On the constructing of tables."

The speaker described an extension of tables by an improved method of differences.

A few other papers were, in the absence of the authors, read by title.

The social functions were well attended by all who were attracted to Edinburgh by the celebration. On Friday evening a reception was given by the Lord Provost of Edinburgh and Council, followed by a concert. On Saturday afternoon a garden party was held at Merchiston Castle, and visitors were permitted to see the room in which it is said that Napier worked out his system of logarithms. In the evening there was an informal social gathering in the Students' Union at the University. On Monday afternoon the Royal Society of Edinburgh gave a farewell reception at the Society rooms.

On Sunday a special memorial service was held at St. Giles' Cathedral, the sermon being preached by the Rev. Dr. Fisher, of St. Cuthbert's, the church in which Napier worshipped and in the churchyard of which he is buried. Dr. Fisher spoke of Napier as a citizen and as a writer on questions of theology. The service was attended by a large number of those present at the celebration.

Mention should be made of the exhibit of Napieriana and of tables and calculating machines. Early editions of works on logarithms, Napier portraits, Napier rods ("bones"), and the priceless Dantzig copy of Bürgi's Progress Tabulen were displayed in cases. All the leading types of calculating machines, models of solids and surfaces, linkages, tide predicting machinery, and other material relating to computation and to those parts of geometry in which Napier had an interest, attracted much attention.

The celebration was followed by a colloquium held under the auspices of the Edinburgh Mathematical Society. Lectures were given by Professors D'Ocagne and Whittaker, and by Messrs. E. Cunningham and H. W. Richmond.

The papers will appear in a volume under the editorship of Dr. C. G. Knott. A description of the exhibit appeared in dignified book form under the direction of Mr. E. M. Horsburgh, and a copy was presented to each participant in the celebration.

Those who attended the celebration were unanimous in their expression of pleasure at the success of the meetings and at the hospitality shown by the citizens of Edinburgh, the Royal Society, the Mathematical Society, and the University.

<div align="right">DAVID EUGENE SMITH.</div>

AN APPEAL TO PRODUCING MATHEMATICIANS.

BY GEORGE PAASWELL, C.E.

A PERUSAL of modern mathematical treatises and dissertations for degrees makes the lay mathematician (I should say rather the amateur mathematician) despair of ever keeping up with the modern trend of mathematical thought. The tone of modern works is not that of disseminating new ideas, but rather that of clothing ideas already familiar to readers in