Napier Tercentenary Celebration

An announcement of the forthcoming Napier Tercentenary Celebration was made on Friday 5 June 1914. It read as given below.

On July 24th to 27th, 1914, there will be held a celebration, under the auspices of the Royal Society of Edinburgh, of the tercentenary of the publication of *Napier's Mirifici Logarithmorum Canonis Descriptio*, the work which embodies the discovery of logarithms.

The Right Hon. Lord Moulton, LL.D., F.R.S., will deliver the presidential address on July 24th; and many distinguished mathematicians, astronomers, actuaries, and engineers will make communications on July 25th and 27th.

An exhibition of calculating machines, apparatus, and books, and of objects associated with Napier and the history of mathematics, will be held in connection with the celebration.

Immediately following the Napier celebration, a Mathematical colloquium will be held on July 28th to 31st under the auspices of the Edinburgh Mathematical Society.

Communications by distinguished mathematicians, astronomers, actuaries, and engineers were made to the Napier Tercentenary Celebration on two days, the first being Saturday 25 July 1914.
The talks of that day, together with a report on the social programme and the events on Sunday 26 July were reported by *The Scotsman* on Monday 27 July:

NAPIER TERCENTENARY CELEBRATIONS
MATHEMATICAL DISCUSSIONS.

The mathematical discussions in connection with the Napier celebration opened on Saturday, in the History Classroom of the University. Professor Hobson, Cambridge, was called to the chair.

Dr J W L Glaisher, Cambridge, gave an address on the work of Napier. He said that, coming at the time it did, the conception of the logarithm in Napier's mind was little short of marvellous. He had no notations, such as they had now, to guide him; and in mathematical developments a good notation was of primary importance. Napier by dint of hard thinking solved a problem, which they would now express as a differential equation, and solve with ease, by analytical methods. As regards arithmetical notation, it would appear that Napier was the first to use the "point" in expressing the decimal fraction, a notation far superior to that devised by Stevinus, and widely used even after Napier's day. The more they examined the method of Napier, the more were they impressed with his greatness as a mathematical thinker. Referring to Lord Moulton's address of the previous day, Dr Glaisher said that he had been much interested in Lord Moulton's construction of the probable stages through which Napier passed to his final conception of the logarithm. He had himself always assumed that the geometrical form in which the invention was given to the world was the original form; but Lord Moulton's suggestion was well worth a careful examination.

THE FIBST NAPIERIAN LOGARITHM.

A brief note by Dr G Vacca, Rome, on the first Napierian logarithm calculated before Napier was read by the Secretary. In a book on arithmetic published in Venice in 1434, the author, Fra Luca Paciolo, propounds the problem to find in how many years a sum would double itself at a given rate of compound interest. The answer was - Divide 72 by the rate of interest and the quotient is the required number of years. This number 72 was shown by Dr Vacca to be approximately a hundred times the Napierian logarithm of 2.

BRIGGS AND NAPIER.

Professor G A Gibson, Glasgow, discussed the question of the transition from Napier's original logarithms to those to base 10 first calculated by Briggs. By reference to the written statements of Briggs himself it was shown clearly that the system suggested by Briggs to Napier as an improvement on the original tables was not what they now called the common, or Briggsian logarithm; but that it was Napier himself who suggested to Briggs to construct the tables of common logarithms as they had been since Briggs carried out the calculations. The familiar theorem that the sum of the logarithms of two numbers was the logarithm of their product was not accurately true for Napier's original logarithms; nor would it have been true for Briggs's suggested improvement. The evidence was clear that it was Napier himself who first suggested making the logarithm of unity zero.

THE LAW OF EXPONENTS.

Professor David Eugene Smith, New York, read a paper on the "Law of Exponents in the Works of the Sixteenth Century." The nature of the geometrical progression and its correspondence with a parallel arithmetical progression were traced from the works of Chuquet (1484) and Boethius (1499) through the writings of Rudolff (1525) and Stifel (1544) to those of later date. It was this line of development which influenced Bürgi, whose Progress Tabulen (1520) contained what was an anti-logarithmic table. The importance of these arithmetical relationships, clearly conceived by the Teutonic School, was not recognised by Tartaglia and Cardan, the writers of the algebras and higher arithmetics of the sixteenth century. These relationships approach so closely the idea of the logarithm that it was cause for wonder that the works of Napier and Briggs were not anticipated.

Lieutenant Salik Mourad, of the Turkish Navy, in a paper on the introduction of logarithms into Turkey, gave an account of the life of Ismail (Caliph Zade), who lived in Stamboul in the 18th century. In order to make the translation of Cassini's Astronomical Tables complete, Ismail Effendi added tables of logarithms and of trigonometrical functions.

ALGEBRA IN NAPIER'S DAY.

Professor Cajori, Colorado Springs, read a paper on "Algebra in Napier's Day, and Alleged Prior Inventions of Logarithms." Claims had been made in this connection in favour of Regiomontanus, of Wright, and of Bürgi. Wright was the first to translate Napier's Descriptio into English, and never himself made any claim to the original invention of logarithms. Bürgi was an independent discoverer of the logarithmic method, but was six years later than Napier in publication, and probably a corresponding interval later in beginning his calculations. Napier's method was theoretically, the more profound.

These various papers, which all dealt with the history of Napier's discovery, were discussed by the Chairman and by Dr Glaisher, Professor Gibson, and Dr Conrad Müller, of Hannover. Professor Cajori and Dr Glaisher were specially emphatic on the untrustworthiness of secondary sources. The historian must go back to first sources: and an error once started died hard. A paper by Dr Somerville, of St Andrews, on Napier's rules and trigonometrically equivalent polygons with extension to non-Euclidean space touched on the other side of Napier's mathematical activity.

The sederunt lasted from 9.30 a.m. to 1 p.m., with a break of half an hour at eleven o'clock, and was fully attended by the members.

POPULARITY OF THE EXHIBITION.

The exhibition continues to attract much attention. It has been decided to keep it open on Tuesday, and visitors who are not members of either the Napier Celebration or the Mathematical Colloquium will be admitted on that day at a special admission charge.

GARDEN PARTY AT MERCHISTON CASTLE.

Members of the Conference were the guests on Saturday afternoon of the directors and masters of Merchiston Castle School at a garden party held in the grounds there. The Castle is a building of much historic interest, and of all its residents the most famous was John Napier. Evidence of the notable association is conveyed by the inscription above the front gate which reads:- "In this house lived John Napier of Merchiston, Inventor of Logarithms. Born 1550. Died 1617." It is believed that the old tower dates from the early half of the fifteenth century, and architectural evidence is not inconsistent with that date. It is recorded that James I. of Scotland raised a loan of money from Alexander Napier, who was the Provost of Edinburgh in 1437, and had pledged the lands of Merchiston, originally part of the Crown demesne, in mortgage for the repayment of the loan. Owing to the non-payment of the loan the estate of Merchiston passed into the hands of the Napiers some time before 1453. The Castle about 1750 passed out of the hands of the Lewis family, who succeeded the Napiers in possession in 1665, and somewhere about the beginning of last century the addition on the south side of the tower, which now forms the front of it, was built. Sometime after 1833, when the school was established, other buildings were added. Unfortunately the weather auspices on Saturday were not of the most congenial character for a garden party, a strong and cold wind blowing throughout the afternoon. There was a large attendance of ladies and gentlemen. Lord Napier, owing to indisposition,

was unable to be present, but Colonel Napier and Sir Alexander Napier were both in the company, which included, among others, Professor H Andoyer, Paris; Professor D Arany, Budapest; Professor Bauschinger, Strassburg; Mr G T Bennett, Cambridge; Sir William and Lady Bilsland, Glasgow; Professor and Mrs Cajori, Colorado; Professor James Geikie, Dr Glaister, Cambridge; Professor and Mm. Hekloff, St Petersburg; Professor Hobson, Cambridge; Mrs Isaac-Roberts; Professor Melikoff, St Petersburg; Professor Dr Conrad Muller; Professor and Mrs Normand, Bombay; Dr Ogilvie, London: Sheriff R L Orr, K.C.; Sir David Paulin; Professor Putnam, University of California; the Right Hon. Mr J Parker Smith and Mrs Parker Smith; Professor D'Arcy Thomson, Dundee; Professor Thomas, Charleston, U.S.A.; Professor S Tscherny, Warsaw: Professor Westergaard, Edinburgh; and Professor Whittaker, Edinburgh. Tea was served on the lawn, and the company were photographed in the west garden. A programme of music was discoursed by H Dambmann's orchestra, and selections were given by pipers attached to the School Cadet Corps. The guests also visited the Napier room and the battlements of the Castle

Dr Knott took occasion publicly to offer the congratulations of the company to Mr Smith, the headmaster of the school, on his appointment to the charge of Dulwich College, London.

SOCIAL GATHERING IN UNIVERSITY UNION.

In the evening about 200 of those attending the celebrations, along with friends and hosts, were present at an informal social gathering in the University Union. They were received by Dr and Mrs Knott, and Mr and Mrs A G Burgess, in the hall of the Union, which was arranged as a drawing-room. During the evening light refreshments were served in the east reading room and dining hall, and an excellent musical programme, which was arranged by Miss Fry, was given in the hall, those taking part including Dr Drinkwater, Mr Fred Falconer, and Miss Dunn.

SERVICE IN ST GILES.

A service was held in St Giles' Cathedral yesterday afternoon, in connection with the Napier Tercentenary celebrations, when the sermon was preached by the Rev. Dr Fisher, of St Cuthbert's. There was a large congregation, which included the pupils from Merchiston Castle School. The lessons were read by Dr Cargill Knott. The Rev. Dr Fisher, preaching from the 90th Psalm, 12th verse, "So teach us to number our days that we may apply our hearts unto wisdom," recalled a speech in 1825 by Thomas Chalmers, when he reproached himself for having during a period of his life occupied himself merely with mathematical interests, and had neglected the realities of time and eternity. The illustrious John Napier, he went on, whom the whole scientific world was honouring in these days, did not forget these two magnitudes, and was a reverent and pious man. It was fitting the remembrance of him should be made not only in the schools where his supreme and commanding genius for mathematics was recognised, but also in the house of God. There also they reverenced science and gave thanks for all its victories. The followers of Him who said, "I am the truth," could never believe that it was in the interests of truth that any one truth should be refused a welcome, or should be neglected or denied. Proceeding, Dr Fisher said Napier brought to his examination of theology rare qualities of mind and character. An examination of Napier's theological book, which he called "A plain discovery of the whole Revelation of St John," disclosed gifts as uncommon and as indicative of greatness as even his mathematical inventions.

The talks of Monday 27 July, together with a report on the social programme and the forthcoming Colloquium organised by the Edinburgh Mathematical Society were reported by *The Scotsman* on Tuesday 28 July 1914.

NAPIER TERCENTENARY CELEBRATION
CLOSING MEETINGS IN EDINBURGH.

The members of the Napier Tercentenary Congress met again in Edinburgh University yesterday forenoon. Professor David Eugene Smith of New York, was voted to the chair. Professor Bauschinger, of Strassburg, made the first communication, being an account of certain formulae and schemes of calculation for the development of a function of two variables in terms of spherical harmonics.

Professor Andoyer, of Paris, gave the history and method of construction of his recently published trigonometrical and logarithmic tables (1911.) These tables contain the logarithms of the trigonometrical functions to 17 significant figures for every hundredth of the quadrant, and to 14 figures for every 10 seconds. M Andoyer also inferred to his present calculations of natural sines to 15 significant figures, a task which he hopes to complete in about two years.

Professor d'Ocagne communicated two short historic notes, the first being to the effect that the principle of the millionaire calculating machine was invented in 1893 by a young French mechanician, Léon Bollée by name, who constructed a machine to help his father, a bell founder, in the necessary calculations. The other more had reference to the development of the modem method of nomography from the older tabulation of numbers in a table of double entry. The earliest systematic application of nomograms he had lately traced to Margett's Longitude Tables of 1791. Till then he had believed that the first user of the method was Pouchet in his Arithmetique linéaire, which was published in 1795.

Mrs Gilford presented her book of natural sines calculated to eight figures for every second of arc. The method of checking the results and averaging the differences were described.

THE CONSTRUCTION OF TABULAR MATTER.

After an adjournment of half an hour the members met again, Dr Glaisher being chairman for the earlier part of the meeting, and Major MacMahon for the later part. Dr J R Milne discussed various methods of constructing tables, and by means of lantern slides, made instructive, comparisons of the methods used by different authors for facilitating work. He hoped by such comparisons to lead to a satisfactory solution of tile problem how best to arrange tabular matter, on what colour of paper, and with what kind of type. Mr Hudson, of the Nautical Almanac, pointed out in this connection some devices for facilitating the work of interpolations, and the Chairman remarked that the questions raised by Dr Milne were of real practical importance, and were well worth consideration.

Mr H S Gay gave some simple and for practical purposes sufficiently accurate formula for determining the trigonometrical functions when the angle is given and conversely, without the use of elaborate tables. Mr J G Fergusson described his percentage unit system of measuring angles, and demonstrated how simply certain practical problems were solved. The method consisted essentially in using the tangent instead of the angle, and laying off the angle so measured from the cardinal points up to 45 degs. Mr W Schooling showed how by use of a certain number and its logarithm, logarithms, reciprocals, and Gaussian logarithms could be calculated by a purely additive process.

Papers by Dr Hutchinson on graphic methods and on the use of the slide rule in crystallography, and by Dr Sheppard on the extension of the accuracy of mathematical tables by improvement of differences and on certain unpublished tables which he had constructed in connection with probabilities, were of a more technical character than those just named. In the absence of the authors, a few other papers which had been prepared for the Congress were held as read.

RECEPTION BY THE ROYAL SOCIETY OF EDINBURGH.

A farewell reception was given to the members of the Napier Tercentenary Congress by the President and Council of the Royal Society of Edinburgh in the rooms of the Society, George Street, yesterday afternoon, and was largely attended by the ladies and gentlemen who have taken part in the celebration. The guests were received by Professor Geikie, the president, and Mrs Geikie, and members of the Council, in the Society's hall, and an adjournment was afterwards made to the library, where light refreshments were served. Music was discoursed by Mr Dambmann's orchestra. Among others present were the Right Hon. J Parker Smith, Sir David Paulin, Sir James Russell, Emeritus Professor Crum Brown, Professor James Mackinnon. Professor Whittaker, Professor Westergaard, Professor F G Baily, Dr W B Blaikie, Dr J C Dunlop, Dr Sprague, Dr Home, Dr F Grant Ogilvie, Dr E M Wedderburn, Dr Pinkerton, Glasgow High School; Dr Sommerville, St Andrews; Dr J R Milne, Dr Cargill Knott and Mrs Knott. Dr Drinkwater, Mr Andrew Watt, Mr A Hewat. Mr A G Burgess, Mr E M Horsburgh, Mr and Mrs T J Millar, Mr G C Chisholm, Mr J J Waugh, W.S.; the Rev. J Lamond. In the course of the proceedings congratulatory addresses were presented by representatives of the University of Strasburg, the Royal Danish Academy of Science, and the Observatory of the University of Varsovie.

EDINBURGH MATHEMATICAL COLLOQUIUM.

The success attending the Colloquium held under the auspices of the Edinburgh Mathematical Society last year encouraged the Society to hold a similar meeting this year. By the courtesy of the Edinburgh University Court, the meetings will be held in the Mathematical Department of the University, and will last from today till Friday. The Committee have been fortunate in securing four distinguished lecturers to discuss file more recent developments of mathematical and physical science. Professor M d'Ocagne, École Polytechnique, Paris, will deliver two lectures on Nomography. It is now generally recognised that for most purposes the nomographic methods are superior to the older, graphical methods of calculation, and a large number of mathematicians are taking advantage of this opportunity of hearing one who is the authority on the subject. Mr R Cunningham, M.A., Fellow of St John's College Cambridge, will deliver four lectures on "Critical Studies of Modern Electric Theories of the Constitution of Matter, Gravitation, Spectroscope, etc." Mr H W Richmond, M.A., F.R.S., Fellow of King's College, Cambridge, will give four lectures on "Infinity in Geometry," and Professor Whittaker will supplement the lectures of Professor d'Ocagne by demonstrating the arithmetical methods of solving certain classes of equations in the mathematical laboratory.

From the list of members which has been issued it appears that nearly one hundred have enrolled, which is an increase of twenty on last year's number. It includes members from various parts of the British Isles, as well as from several European countries, America, South Africa, and India. Over thirty of these are professors or lecturers in Universities, but the majority are engaged in teaching in secondary schools and colleges. Astronomy engineering, actuarial and statistical sciences, also send representatives.

An account of the colloquium in the Scottish press is given at THIS LINK.

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