MATHEMATICAL BIOGRAPHY: A MACTUTOR CELEBRATION

16-17 September 2016

ABSTRACTS

Philip Beeley: *'The learned shall reap the benefit of your spare hours'. An essay on the life and work of the mathematical intelligencer John Collins*

The second half of the seventeenth century witnessed a remarkable growth in the mathematical sciences in England, culminating in the publication of Newton's Principia in 1687. This progress was reflected not only in the newly-established Royal Society, but also in an increasingly sophisticated level of of practical mathematics in accountancy, commerce, navigation, and instrument making. New mathematical learning permeated workshops. warehouses, dockyards, coffee houses, and taverns, and was disseminated by printed books, journals, and letters. The most prominent facilitator of mathematical exchanges in Restoration England was undoubtedly John Collins (1625-83), whose primary goal became 'the promotion of mathematick learning'.

The talk will present some of the results of the AHRC project 'Mathematical Culture in Restoration England: Life and Letters of John Collins', whose outputs include an intellectual biography of Collins and a complete edition of his correspondence. It will be a first attempt (or 'essay') at presenting an account of Collins's life and will outline and discuss the various challenges which this biographical task entails.

John Bibby: *Zigzagging round Karl Pearson's Yorkshire roots: an idiot's tour using familiography, local history, biography and science history*

This paper will recount an amateur's investigations into the family history of Karl Pearson, and how it led into local histories and beyond. Serendipities abound, especially when one gets into grey literature and the web. How can one engage the contemporary waves of enthusiasm for family histories, local history and centenaries? How important or unimportant are scientific ideas in mathematical biographies? Why would a biographer-eugenicist like Karl Pearson be so disinterested in his own family history?

A.E.L. Davis: *A survey of sources for biographies of female mathematicians*

This talk will survey sources available to biographers of female mathematicians. It will draw on Dr Davis' work in compiling the Davis Archive, a dataset which lists the names of all women honours graduates in mathematics - approximately 2500 women in total - from the 21 colleges and universities that existed or were founded in the British Isles during the period 1878-1940. At the same time more than 200 books were accumulated, written by or about female mathematicians prior to 1940. Some of these are academic texts, others are school text books, discourses on science, and biographies. This collection has been donated to the London Mathematical Society and is now named the 'Philippa Fawcett Collection'.

Jacqueline Dewar: *Women and mathematics: A course and a scholarly investigation*

This talk will summarize the content and outcomes of an interdisciplinary course on women and mathematics. The course, grounded in the biographies of ten women mathematicians (Hypatia to Emmy Noether), engages students in mathematical topics related to the work of these women and addresses gender equity issues that occur in mathematics education from kindergarten to the doctoral level and in mathematics-related careers in the United States. As the students discover from their study of the biographies, the themes that emerge from examining the lives and work of these women mathematicians from the past are still relevant today. The course encourages students, some of whom are future K-12 teachers, to adopt a more expert view of mathematics as a study of patterns rather than a study of numbers.

A follow-up study of four former students, now teachers, employed ethnographic methods in a classroom observation and semi-structured interview to investigate whether, and how, their resolve for equity persisted and influenced their classroom teaching. The results showed the course did have a long-term impact. The study also revealed a number of possible implications for practice in undergraduate teaching and in teacher preparation programs, some of which will be mentioned.

Kris Grint: *Crowdsourcing, discovery, and public engagement with Jeremy Bentham*

This talk will reflect on the successes of *Transcribe Bentham*, an online crowdsourcing initiative based at UCL that invites members of the public to transcribe the manuscripts of Jeremy Bentham (1748–1832), the legal philosopher and jurist. Bentham's life and works have been a subject of study at UCL at least since the founding of the Bentham Project in 1959. I will argue that recent research at the Project, in conjunction with the launch of TB in 2010, has transformed Bentham scholarship in a myriad of ways that have made an eccentric, reclusive thinker more interesting, more accessible, and more relevant to both academics and the wider community than ever before. Whilst Bentham himself (or at least his preserved mortal remains or '*Auto-Icon*') remains seated and on public display in a dusty box in Bloomsbury, he now figuratively stands at the forefront of several disciplines, from digital humanities and intellectual biography, to computer science and linguistics. How this has been achieved — and how the process might be repeated — are questions that will also be addressed.

Christopher Hollings: *Reading between the lines: Soviet mathematical biography*

Like any nation, the USSR sought to celebrate its scientific figures, with mathematicians receiving a great deal of attention: obituaries and celebrations of prominent mathematicians featured frequently in leading mathematical journals. However, these biographies are of a very particular style: they are quite impersonal, and could almost have been written as a series of bullet points. Moreover, they are rather selective in the details that they present (true of any biography?): features of the subject's life that did not sit well with the official Soviet line were omitted, whilst other more acceptable points (that would later be quietly dropped from post-Soviet biographies of the same subject) were given a prominent place. In this talk, I will note the perils and pitfalls of working with such biographies, and discuss what we can learn from what they don't tell us.

Eva Kaufholz: *"…the first handsome mathematical lady I have ever seen!" — On the role of beauty in the portrayals of Sofja Kowalewskaja*

Physical appearance is described in portrayals of scientists of all periods and both sexes. But it is rarely considered as important an aspect as in the case of the mathematician, author and journalist Sofja Kowalewskaja (1850-1891). For more than a century, depictions of her looks

have covered a wide range of appraisement, describing her both as rather ugly, a ravishing beauty, and everything in between. Moreover, her beauty (or lack thereof) is often considered a pivotal issue in her vita and for her scientific career in particular. The theory of the "bombshell mathematician" also gave rise to a number of rumors, which proved to be as persistent as they are wrong.

The discrepancies concerning the assessment of her appearance, as well as the significance attributed to it, are due to various factors; among them changing contemporary assumptions about women in science or the more or less implicit intentions behind each portrayal itself.

This talk aims to present the scope of descriptions of Kowalewskaja's looks from the very first biographical accounts to her portrayal in modern literature, by highlighting some of the most influential examples in their historical context. I will also comment on the changing views of the mathematician and how she was instrumentalized for various agendas in her reception over the years.

Jan Kotůlek: *Prosopography of mathematicians connected to disappearing German-speaking community in Prague (1938-1945)*

In 19th century, Prague gradually had grown to a multicultural crossroad of mathematical research, with a specific milieu formed by mixing and competing of Czech, German and Jewish influences. German-speaking mathematical community, raised by G.A. Pick, flourishing after stays of A. Einstein and W. Blaschke, served in 1930s as refuge for several eminent mathematicians (e.g., L. Berwald, R. Carnap, E. Finlay Freundlich, P. Frank or K. Löwner) whose renown attracted young talented scientists.

As the community was largely Jewish, it suffered first heavy blow by expanding Nazi policies. After the Munich Accord, Nazi influence accelerated introduction of anti-Semitic measures in Czechoslovakia. Resulting decimation of Prague mathematical circles due to emigration (R. Carnap, E. Finlay Freundlich, P. Frank, K. Löwner L. Pollak and A. Winternitz) was followed later by holocaust (G. Pick, L. Berwald and W. Fröhlich were killed in ghettos, P. Funk and H. Löwig survived).

Consequently, teaching at the two Prague universities must have been reconstructed nearly from scratch. The vacancies were filled by mathematicians with varied attitudes to the Nazi regime (T. Vahlen, G. Gentzen, G. Kowalewski, E. Mohr). After World War II, in the waves of revenge, Prague professors were imprisoned (G. Genzten, J. Fuhrich and T. Vahlen died in prison) or expelled from Czechoslovakia. Even survivors of Nazi camps were forced to leave the country. It brought Prague back to the rank of provincial city.

History of German-speaking scientific community in Prague belonged for a long time to taboos. It was erased from the historical memory of their Czechoslovak colleagues. Only recently, an interest for the topic raised. Arising biographical studies are faced with many difficulties. First, there are heuristic problems: due to the war, many sources didn't survive and most of the scarce sources is of official provenance. Moreover, important sources are fragmented through many countries. Consequently, there is only limited possibility to achieve plausible interpretations of deeds, motives or political attitudes. In order to overcome these difficulties, prosopograhical research has been conducted. Shared historical experience of the respective mathematicians enabled us to determine the key features of their careers, contextualize and also explain actions they took.

Ursula Martin: *Writing the mathematical biography of Ada Lovelace*

Ada, Countess of Lovelace (1815-1852) is famous for a paper published in 1843, which presented Charles Babbage's unbuilt general-purpose computer, the 'Analytical Engine'. A detailed description of the machine was accompanied by a table, displaying how it might compute the Bernoulli numbers, often called "the first computer programme". Lovelace has been celebrated in a number of biographies which focus more on her famous father (the poet Lord Byron), her relationship with her mother, and her tragically short life, than her mathematical and scientific contribution.

Yet the Lovelace archives include accounts of her early mathematical education, and a remarkable mathematical correspondence course undertaken with Augustus De Morgan when she was in her mid-20s, in which she studies essentially the same material as his undergraduate students, and discusses research frontiers of the day, such as quaternions and divergent series. They allow us to reassess the mathematical knowledge that enabled Lovelace to write so articulately about Babbage's engines, and to undo the misapprehensions of biographers who have variously dismissed Lovelace's mathematics as "hieroglyphics", misunderstood the nineteenth century context of mathematics or of women's education, or dismissed Lovelace's aspirations as "delusional". It also raises broader question about how we misremember and misreport the achievements of female mathematicians.

Dagmar Mrozik: *The Jesuit Science Network. A digital prosopography project on Jesuit scholars in early modern science*

The Jesuit Science Network, core of my dissertation project, is a digital prosopography of Jesuit scholars in the early modern sciences. Since its foundation in 1540, the Society of Jesus has been inextricably linked with the teaching, consolidation, and creation of knowledge, among it also the early modern precursors to today's mathematics and natural sciences.

However, there has been no comprehensive overview over the involved Jesuits so far - a situation which I aim to remedy. The Jesuit Science Network is conceived as a biographical database along with a corresponding project website that allows access to and display of the collected data. This data includes information on the general biography, education, career, and interpersonal relationships. The attached website offers a summary fact sheet for each of the over 1000 entries as well as extensive search functionalities and graphical visualizations such as personal networks.

These digital methods are used to realize a prosopography spanning more than three centuries of Jesuit scientific activity and thus facilitate new, comprehensive research questions such as: What were the centers of Jesuit geometry in the 17th century? Which mathematical topics were studied on the grounds of the modern-day Czech Republic? And who were the Jesuits working as astronomers?

In my talk, I want to demonstrate the use and usefulness of the Jesuit Science Network by showing how to find the answers to these questions with it, but also speak of the challenges that I encountered while setting up such an extensive digital biographical collection.

Laura Rodriguez: *Frigyes Riesz between the two Wold Wars*

Frigyes Riesz, was a Hungarian mathematician today best known for his work on functional analysis. He was born on the 22nd of January in 1880 in Györ and died the 28th of February 1956 in Budapest. Some aspects of his live have always been mentioned in his biography. For instance: his studies in Zurich, Goettingen and Paris, his first university position in 1912 in Cluj-

Napoca, and his moving to Szeged after the First World War, where he founded, together with some colleagues, a mathematical institute and a mathematical journal.

Nevertheless his biography is rather thin. There exist only a few documents of him in archives in Germany, France and Hungary. His scientific correspondence before 1919 is missing and most of his later correspondence is in private hands. Assisted by his family I was able to find more testimonies and add some details to his biography. In my paper I will focus on three moments of his life during a highly politicised time.

At the end of the First World War, geographical changes due to the outcome of the war had forced him to leave Cluj-Napoca, now Rumanian, for Szeged, a citiy within the new defined Hungarian boundaries. In a letter Riesz describes the tense situation in Cluj-Napoca before the exile of the whole university. Once in Szeged, he took advantage of his international contacts to enforce the establishment of a new founded mathematical journal. Some letters give proof of his effort to gain distinguished authors for this journal. Furthermore, documents from his native Györ give testimony of his ancestry, of how this affected him and his family during the Second World War, and of how much his colleagues abroad were worried about him.

Because of the loyalty he showed to Hungary when he left Cluj-Napoca and his efforts in Szeged, he has been represented, specially by Hungarians, as a mathematician that greatly contributed to rebuilt the Hungarian mathematical culture after the war. On the other side, in the aftermath of the Second World War there were issues that should not be addressed because they were tabu. These issues have been clearly obliterated in his biography.

Michalis Sialaros: *Revisiting Euclid's biography: a critical examination of the anecdotes about his life*

Euclid's work is phenomenally famous. No mathematical treatise has ever been read, edited, praised, or even criticised more than his magnum opus, the *Elements*. Unfortunately, however, very little is known about Euclid's life. The time of his action can roughly be estimated from a series of speculations, most of which are based on two anecdotes. The one has come down to us by the philosopher Proclus '(T)hey say that once Ptolemy asked him (Euclid) if there is in geometry some way shorter than that of the Elements. And he replied: "there is no royal road to geometry"', and the other by the anthologist Joannes Stobaeus 'Someone who had begun to learn geometry with Euclid, when he learned the first theorem, asked Euclid "what shall I earn by having learnt these?" And Euclid called the servant and said: "Give him three obols because he must gain out of whatever he learns".'

In this paper, I seek to explore the second anecdote in an attempt to shed some light on the matter of its origin. Within this framework, I critically examine a hitherto largely ignored proverb attributed to the Pythagoreans, which, I argue, can offer valuable insight into the conceptual background of the anecdote in question.

Richard Simpson: *Travels with the MacTutor*

It may not be generally appreciated that the MacTutor can be used as a stimulating guide for exploring foreign parts – in fact, it's right up there with Baedeker and Lonely Planet. This light-hearted talk will take us to places other guides cannot reach. We'll explore death in Venice, female prodigies in Bologna, the curse of the notice "Chiuso per Restauro", curves in Perga, the disappearance of Archimedes from Syracuse, a curious sundial at Aphrodisias, Brunelleschi's Florence, and we'll finally experience the mathematical perfumes of Miletus and Cyrene. No one going abroad should fail to consult MacTutor before they go!

Steven Skiena: *Who's Bigger? A Quantitative Analysis of Historical Fame*

A discipline of computational social science is emerging, applying large-scale text/data analysis to central problems in the humanities and social sciences. Here we study the problem of algorithmically-constructing quantitative measures of historical reputation. Who is more historically significant: Gauss or Hilbert? Newton or Einstein? Beethoven or Elvis?

By exploiting large-scale data from several sources, we have developed a factor analysis-based ranking method which measures the relative significance of over 800,000 people described in Wikipedia, in a rigorous way. We have validated our measure through polls and analysis of published rankings of historical figures, demonstrating that our rankings are generally better than those of human experts.

Our measure gives us the power to rigorously investigate several previously difficult-to-formalize questions, including:
- Are the right people in the history books?
- How well do Halls of Fame perform in identifying the most significant individuals?
- Are men and women treated equally in Wikipedia?

Historical rankings is the subject of my recent book: *Who's Bigger? Where Historical Figures Really Rank* Cambridge University Press, co-authored with Charles B. Ward. Our rankings are available for inspection at http://www.whoisbigger.com.

Henrik Kragh Sørensen: *"Abel der Glückliche": Appropriations in the biographies of Niels Henrik Abel*

Dead before he turned 27, melancholy and deeply worried about his future, and not recognized for his greatest contributions during his lifetime, the Norwegian mathematician Niels Henrik Abel (1802-1829) does not lend himself easily to the predicate "Glücklich". Yet, that was how another great mathematician, K. T. W. Weierstrass described him. This apparent discrepancy points to a general feature about biographies: They often say as much about the biographer as about the biographee.

Obviously, biographies are written cumulatively - already established facts and interpretations play into subsequent biographies. Yet, each biography is an appropriation by a biographer for specific contexts, audiences, and cultural values.

In the case of Abel, biography and legacy are intimately connected, as most biographies of Abel written during the 19th century were written by and for mathematicians who somehow stood to gain from the biographical enterprise. These acts of self-fashioning are thus sources to historical analyses of the image of mathematics, not least in the Norwegian context. Central interpretations about Abel's personal affairs and the role of the Norwegian state in securing a future for its brightest son were addressed already in the obituaries and reports written by people closely acquainted with Abel. Other tropes such as his fierce competition with C. G. J. Jacobi over the study of elliptic functions were established in the chronological mapping in the first book-length biography produced by C. A. Bjerknes in the 1880s. Simultaneously, Abel's collected works were also republished and reached a greater audience. And in connection with the centennial in 1902 during a period of great Norwegian national self-awareness, Abel's extant letters were published giving rise to a new wave of interpretations and appropriations.

In this talk, I report on a longitudinal, meta-biographical project analyzing biographies of Abel from the obituaries to the contemporary ones such as the biography in the MacTutor archive, but focused on the 19th century. In particular, I sketch the process by which Abel's biography was canonized and discuss how key events and tropes have been open to interpretation.