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Hansen, Vagn Lundsgaard; Toft, Bjarne

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The Danish Mathematical Society Turns 140

Vagn Lundsgaard Hansen (Technical University of Denmark, Kgs. Lyngby, Denmark) and Bjarne Toft (The University of Southern Denmark, Odense, DK)

On the evening of 8 October 1873, a group of 65 people attended a meeting in Copenhagen, called with the purpose of founding a society whose members could meet regularly for conversation, lectures, discussions and occasional social gatherings, to encourage a lively interaction for the benefit of the mathematical sciences and their practical applications. The new society was named *Matematisk Forening*. The name was changed to *Dansk Matematisk Forening* in 1952.

The idea to found the society was conceived by the actuarial scientist, mathematician and astronomer *Thorvald Nicolai Thiele* (1838–1910), who is now famous as a pioneer of statistics. There were nine founding members who called for the meeting, including the famous Danish mathematicians *Julius Petersen* (1839–1910), known for graph theory, the Petersen graph and a famous book on geometrical constructions, and *Hieronymus Georg Zeuthen* (1839–1920), known for his work in enumerative geometry and the history of mathematics. Among the founding members was also a young military officer *V. H. O. Madsen* (1844–1917), who taught mathematics at the Military Academy and later rose to the rank of general. In addition to the military and mathematics, Madsen had a political career and was secretary of defence in an important government 1901–1905, marking a shift in the political system in Denmark. He also served as president of the society 1903–1910.

The history of the Danish Mathematical Society is well documented in written material after 1905, while the history of the early years are based mostly on remembrances from members of the society collected around 1923 by *Christian Crone* (1851–1930), who was a board member of the society in the period 1880–1882. In the early years, the society held regular meetings in a restaurant in Copenhagen and archives of the society were apparently stored in a box in the cellar of the restaurant. For unknown reasons the box disappeared sometime in the 1890s.

Crone writes that Thiele was much appreciated by his students, although he was less easy in his interactions with other people than Zeuthen and Petersen. For a number of years, Thiele kept his house open for mathematicians on fixed evenings and it was here that the idea of creating a mathematical society was conceived. It is evident that Crone had a deep respect for Zeuthen and his ability for strong concentration within his research field of enumerative geometry, where he is one of the pioneers, and in his groundbreaking studies of Greek mathematics. Zeuthen was greatly appreciated by his many students due to his noble and gracious character. Petersen also

made an impression on the young Crone, who summarises his view of Petersen with these somewhat ambiguous words: “Concerning Julius Petersen one can maybe say, that his strength was more the fertility of his endowment rather than his ability for strong concentration.” But, nevertheless, Petersen gave brilliant lectures with clear expositions and many elegant details, to the undivided enjoyment of the participants. Petersen and Zeuthen were very different in their behaviour and attitudes, but mathematics in Denmark has never seen a better pair of colleagues – probably due to their common interest in mathematics, starting when they were boys of 10 living four houses apart in the town of Sorø.

In the years 1895–1903, the number of members of the society was about 40–50, showing a decline in the number of members in the period 1873–95 from the original 65 members signing up in 1873. In the years after 1903, the membership grew again and reached 95 in 1923. In 1951, the number of members was 119 and by the time of the 100 year anniversary in 1973 it had doubled to more than 200. This growth was stimulated by the new mathematical department that had opened at Aarhus University in 1954. The growth in membership was further enhanced by the mathematical departments that opened in Aalborg, Odense and Roskilde around 1970, so that today the Danish Mathematical Society has about 300 members of which around 70 are also members of the European Mathematical Society.

It is not possible to name the presidents of the society before 1892, partly due to the more informal organisation of the society in the early years and in particular due to the lost archives of the society from that period. Internationally known presidents of the society up to 1951 include: J.L.W.V. Jensen (1859–1925), president 1892–1903, known for the famous *Jensen inequality*; and Harald Bohr (1887–1951), president 1926–29 and 1936–51, known for his theory of *almost periodic functions*. After the death of Harald Bohr, the society was restructured and fixed terms for presidents and other members of the board were introduced so that presidents could serve for only four years at a time. As mentioned earlier, the society also changed its name to *Dansk Matematisk Forening* in 1952. Of the presidents serving under the new terms let us mention: Børge Jessen (1907–93), president 1954–58, known for his contributions to *integration theory* and *subdivision of polyhedra*; and Werner Fenchel (1905–88), president 1958–62, known for his deep work in *differential geometry* and *convexity theory*.

Up to around 2000, the main activities of the society were regular evening meetings with an invited lecture

followed by a gathering, where the participants and the lecturer would meet and share light refreshments with open sandwiches. Here you could discuss the lecture and what was going on in the various mathematical circles in Denmark. In this period of the life of the society, this functioned very well and was crucial, since it was the place where Danish mathematicians, mostly in the Copenhagen area, could meet each other on a regular basis. From the end of the 1980s it became more and more clear that evening meetings were no longer so popular, with many young parents among the members, a growing number of colloquia and mathematical seminars at all the major mathematical departments in Denmark and fast-growing specialisation in mathematics. It became difficult to attract people to the meetings.

Bodil Branner, president 1998–2002, made a substantial effort to transform the society into a mathematical society for all Danish mathematicians. To this end, she initiated a Danish newsletter *Matilde*, modelled on the EMS Newsletter, to provide a common reference point for the whole membership. She also tried to spread the activities of the society throughout Denmark, for example by having annual meetings at the various Danish universities in turn. In the beginning, all of this worked very well. But we have come to realise that it is difficult and expensive for a small country to run a nice, polished magazine. Lately, we have had difficulties in managing the editorial process of the production of *Matilde*. We hope, however, that we can succeed in getting our magazine running again in good shape. In the meantime, we enjoy the brilliant work done in both the editorial phase and in the production phase of the magnificent EMS Newsletter.

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Vagn Lundsgaard Hansen [vlha@dtu.dk] is a professor emeritus at the Technical University of Denmark. He was the first Chairman of the EMS RPA Committee, 2000–2006. In 2012 he was named a Fellow of the American Mathematical Society (inaugural class). He served as President of the Danish Mathematical Society for the period 2008–2012.



Bjarne Toft [btoft@imada.sdu.dk] is an associate professor at the University of Southern Denmark in Odense, Denmark. He studied at Aarhus University and the University of London, obtaining a PhD in 1970. With T. R. Jensen he is the author of a much cited book [Graph Coloring Problems, Wiley 1995], which contains a description of more than 200 open problems. Bjarne Toft was elected President of the Danish Mathematical Society in 2012.

ICMI Column

Mariolina Bartolini Bussi (Università di Modena e Reggio Emilia, Italy)

The Volume of the 19th ICMI study

At the end of 2012, the Volume of the 19th ICMI study on “Proof and Proving in Mathematics Education” was published. This volume, edited by Gila Hanna and Michael de Villiers, was the outcome of the long process of realising the study: the official launch in 2007 with the appointment of the two co-chairs; the invitation of eight additional experts in the field of proof in mathematics education to serve on an International Program Committee (IPC); the organisation of two IPC meetings (in Essen and in Sèvres) to prepare the discussion document and to select the invited participants in the study; the organisation, in Taiwan, of the study conference, with additional invited scholars (Giuseppe Longo, Jonathan Borwein, Judit Grabiner and Frank Quinn) to deliver plenary talks on topics related to proof in mathematics; and the public presentation of the volume at ICME 12 in Seoul (South Korea). From this, it is evident that the

intention was to take into account different cultural traditions. A panel was also organised at the study conference, with eminent experts (Karin Chemla, Wann-Sheng Horng and Men Keung Siu) to discuss proof as perceived in ancient Chinese mathematics writing.

The outcome is a very rich volume, accompanied by the proceedings of the study conference, freely available online from the ICMI website (<http://www.mathunion.org/icmi/digital-library/icmi-study-conferences/>). It is worthwhile mentioning that during the long process of the study, the publication of the proceedings of an additional conference on “Explanation and Proof” (Essen, 2006) took place, with most of the participants who took part in the ICMI study. Hence, in a few years, a number of relevant volumes about the teaching and learning of proof have been published. This coincidence is not trivial and bears witness the importance of proof in mathematics education.