View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Elsevier - Publisher Connector

Available online at www.sciencedirect.com

SCIENCE DIRECT®

ELSEVIER

Linear Algebra and its Applications 411 (2005) 1–2

LINEAR ALGEBRA AND ITS APPLICATIONS

www.elsevier.com/locate/laa

Preface

Sir Thomas Muir had a remarkable career. He was born in Stonebyres, Lanarkshire, Scotland, in 1844, studied in Glasgow, and held a tutor position in St. Andrews. Later, he served as Superintendant General of Education in the Cape Colony of Capetown (under British rule) until his retirement, where he finally passed away in 1934. He was a universally educated man, with interests ranging from mathematics and physics to languages and music. According to witnesses, above all he was an outstanding scholar and teacher.

Most of his work in mathematics was dedicated to the development of the *Theory of Determinants*. A list of his work is reproduced in the article by Pieter Maritz in this volume, which also describes in detail his life as an educator, organiser, and mathematician.

To find the proper place for the "Theory of Determinants" in the mathematics of the 1900s, we should not look at the 2000 Mathematics Subject Classification, where we find "Determinants, permanents, other special matrix functions" as a sub-field of "Linear and Multilinear Algebra" (rightly so, from today's point of view). We get a more appropriate idea if we look at the list of subjects under which books are classified in the famous library of the Institut Mittag-Leffler, Djursholm, Sweden, now owned by the Swedish Academy of Sciences. The institute was originally conceived by Muir's contemporary Göstan Mittag-Leffler for his own villa, where the library and institute are still located: there one finds "Determinants" on equal par with "Analysis", "Algebra", and "Number Theory", with "Determinants" occupying a prominent section on the balcony of the library.

While Sir Thomas Muir made important contributions to the Theory of Determinants, most notably to determinantal identities (some of which are described in some detail in the article by Pieter Maritz), his most outstanding achievement is certainly his five volume treatise "The Theory of Determinants in the Historical Order of Development", Parts I–IV, and "Contributions to the History of Determinants 1900–1920". This is outstanding in many ways. These five volumes survey (essentially) all the writings on determinants, from works by Leibniz in 1693 to works written only

0024-3795/$ - see front matter © 2005 Elsevier Inc. All rights reserved.
doi:10.1016/j.laa.2005.07.011

ten years before the publication year of the last volume. Muir does not content himself by just setting up a list of the works. For each one, he describes briefly the contents, puts them in relation to other works of the time, and finally classifies them according to a scheme that he invented. Everyone who has searched for something particular in these volumes will be able to testify how effective Muir's scheme is, how quickly one finds what one needs, and how informative Muir's synopsis is. Needless to say, we find Muir's volumes in the balcony section of the Mittag-Leffler library.

Undertaking the writing of such a survey is unparalleled in mathematical history. In fact, we wish that there were more compendiums "Theory of … in the Historical Order of Development", but we are at the same time (sadly) aware that this wish will not materialize.

Seventy-five years after the appearance of the last volume, "Contributions to the History of Determinants 1900–1920", it seemed only appropriate to dedicate a special volume of *Linear Algebra and its Applications* to Sir Thomas Muir, with determinants being the central subject. Certainly, the mathematical environment has drastically changed during these 75 years. Nevertheless, we believe that this volume testifies that determinants are still a lively and attractive subject with applications in many fields, including Algebra, Combinatorics, Geometry, Number Theory, and Physics.

Wayne Barrett
Samad Hedayat
Christian Krattenthaler
Raphael Loewy

Available online 12 September 2005