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Matérn, Bertil

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Keywords:	Spatial statistics, Forestry, Cluster point process
Abstract:	Bertil Matérn (1917-2007) was a Swedish forester and mathematical statistician. His most important contribution was his dissertation *Spatial Variation* which contains much of the mathematical foundation of spatial statistics.

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Bertil Matérn 1917-2007

Born: May 18, 1917 in Gothenburg, Sweden

Died: November 13, 2007 in Danderyd, Sweden

Contributed to: Spatial statistics, forestry statistics, point processes

(Ernst) Bertil (Erik) Matérn was the son of pharmacist Ernst Matérn (1879-1954). In 1941 he started studying mathematical statistics with Harald Cramér at Stockholm University, where he became assistant lecturer. In 1945, the new Director Markus Näslund of the Swedish Forest Research Institute, who had a longstanding connection with Cramér, requested a trained statistician for the new statistical section of the Institute to help with the National Forest Inventory. Cramér suggested Matérn, who ended up writing a licentiate thesis on estimating the accuracy of line and area surveys (Matérn, 1947). This is a very early example of using spatial stochastic processes to

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compute standard errors for spatial surveys.

In 1949 Matérn was appointed Director of the statistical section of the Institute. In 1952, the Institute was folded into the Royal College of Forestry, where he 1963 became the first professor of Mathematical Forestry Statistics. In 1975 the Royal College of Forestry became part of the Swedish University of Agricultural Sciences.

Professor Matérn's PhD dissertation, his undoubtedly most influential work, was published in 1960, although most of the work had been done much earlier. His PhD adviser was Cramér, and the topic was Spatial Variation (Matérn, 1960), extending the work in his licentiate thesis. The work has been reprinted by Springer in the *Lecture Notes in Statistics* series (Matérn, 1986) with minor changes and a new introduction. Although the subtitle is "Stochastic Models and their Applications to Some Problems in Forest Surveys and Other Sampling Investigations," the first half of the book is largely theoretical. It is the standard reference for characterising isotropic spatial covariances, defines the different Matérn classes of cluster point processes, introduces random set processes and much more.

Other major work by Matérn include a book (Matérn, 1956) about how to analyze tree sections that are not well approximated by a circle, and an early discussion with Tore Dalenius on unifying the theory of random experiments (Dalenius and Matérn, 1964). A trip to China after his retirement in 1982 resulted in a set of lecture notes (Matérn, 1984) summarising his scientific work (Bondesson, 2017), with sections on statistical methods in

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forest research, geometrical probability and forest mensuration, mathematical models in forestry and the development of sampling methods in forestry.

He had a somewhat surprising influence on many scientists. For example, Peter Whittle (Ranneby, 1982, p. 299) taught himself Swedish in order to be able to read Matérn (1947), and Peter Diggle (Gregoire and Diggle, 2017) became interested in forestry applications after spending a sabbatical with Matérn in 1978 (resulting i.a. in Diggle and Matérn (1980)).

Matérn married Carin Berglund in 1947. They had two daughters, Barbro and Gunhild.

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