**ANNOTATED LIST OF PUBLICATIONS**

**BOOKS AND DISSERTATIONS**

**2015**

**Summary**
The book is a scientific biography of Mario Tchou, a founding father of Italian computer science. It is also an account of the rise and fall of the R&D initiative in electronics that he directed during the 1950s and 1960s on behalf of the Italian company Olivetti, a brand famous worldwide for its mechanical calculators and typewriters. By considering the issues of industrial R&D the monograph contributes to investigate critical aspects of technology transfer in Italy. Mario Tchou (1924-1961) was the son of a Chinese diplomat in Italy and began to study engineering in Rome during WWII. In the aftermath of the conflict Tchou moved to the United States where he completed his scientific training and became assistant professor in electrical engineering at Columbia University, New York. At the mid of the 1950s Tchou returned to Italy to lead the Olivetti Electronic Research Laboratory, an initiative promoted by Adriano Olivetti, the visionary president of the Olivetti company, to develop the project of an Italian mainframe. Tchou and his co-workers designed and built from scratch a commercial mainframe called ELEA 9003 and several electronic devices for improving the quality of the mechanical calculators traditionally sold by Olivetti. Despite the successful completion of the computer project, the initiative of R&D was structurally weak, because it did not have public support outside the company nor it was appreciated by the traditional managerial establishment of Olivetti. The untimely deaths of Adriano Olivetti (1960) and Mario Tchou (1961) marked the collapse of the Olivetti’s Laboratory and in 1964 the U.S. company General Electric took over the bulk of the Italian R&D experience in computer science. The account of Mario Tchou’s life and his work as leader of the Olivetti’s Laboratory is here enriched by oral histories collected with Mario Tchou’s relatives and with former staff members of his Laboratory and by interviews with the sociologists Franco Ferrarotti and Luciano Gallino who worked for Olivetti in the period examined.

**2013**
“Making Sense of Figures”: Statistics, Computing and Information Technologies in Agriculture and Biology in Britain, 1920s-1960s [in English].

**Summary**
Throughout the twentieth century statistical methods have increasingly become part of experimental research. In particular, statistics has made quantification processes meaningful in the soft sciences, which had traditionally relied on activities such as collecting and describing diversity rather than timing variation. The thesis explores this change in relation to agriculture and biology, focusing on analysis of variance and experimental design, the statistical methods developed by the mathematician and geneticist Ronald Aylmer Fisher during the 1920s. The role that Fisher's methods acquired as tools of scientific research, side by side with the laboratory equipment and the field practices adopted by research workers, is here investigated bottom-up, beginning with the computing instruments and the information technologies that were the tools of the trade for statisticians. Four case studies show under several perspectives the interaction of statistics, computing and information technologies, giving on the one hand an overview of the main tools – mechanical calculators, statistical tables, punched and index cards, standardised forms, digital computers – adopted in the period, and on the other pointing out how these tools complemented each other and were instrumental for the development and dissemination of analysis of variance and experimental design. The period considered is the half-century from the early 1920s to the late 1960s, the institutions...
investigated are Rothamsted Experimental Station and the Galton Laboratory, and the statisticians examined are Ronald Fisher and Frank Yates.

**CONTRIBUTIONS TO CONFERENCE PROCEEDINGS AND EDITED COLLECTIONS**


Abstract
Over two hundred women worked as computing assistants in the Rothamsted statistics department during the twentieth century. They were employed in the analysis of field and laboratory experiments and in the examination of the returns of agricultural surveys. Before World War II they did calculations with pen, paper, slide rules and electromechanical calculating machines, but during the 1950s, when the department underwent an early process of computerization, their tasks shifted to data processing. Only sparse records exist on the work of these women, and their contribution to the activity of the Rothamsted statistics department has never been assessed consigning them to invisibility. Combining the literature currently available on laboratory technicians with the one on human computers and data processors the paper will provide a *longue durée* perspective (1920s-1990) on the work of the female assistants in the Rothamsted statistics department, addressing two distinct aspects. On the one hand it will examine how the tasks of these women evolved with the computing technologies available in the department. On the other hand the paper will reflect on the invisibility of these assistants, who are never explicitly accounted as contributors to the scientific activity of the Rothamsted statistics department, despite being a conspicuous component of its staff.


Abstract
Inferential statistics is one of the mathematical tools that have transformed twentieth century agricultural research to increase the profitability of farming. Since the 1920s statistical methods systematically redefined the techniques for the design and analysis of field and laboratory experiments in agricultural science and helped to unravel the complex factors involved in agricultural meteorology. The paper traces the impact of inferential statistics on agricultural practices in Britain during the 1920s and 1930s considering the activity promoted by the agricultural station of Rothamsted in Hertfordshire. In particular, it investigates the experiments set up by the Rothamsted staff on the fields of private farms and the involvement of the statistics department of the station in the Crop-Weather Scheme promoted by the British Ministry of Agriculture and Fisheries since the 1920s. The case study presented offers the opportunity to re-discuss the boundary between the technical expertise of the statisticians and the practical knowledge available to farmers, it investigates the status of inferential statistics
– science or technology? – when evaluated for its impact on cultivation practices, it addresses the networks that promoted the encounter of scientific and practical knowledge in British farming during the first half of the twentieth century. In conclusion, the issues raised by the case study are used to draw general remarks on the making of useful knowledge.


**Abstract**

About fifty years ago, Elea 9003, the first Italian mainframe fully transistorized, was built in the Olivetti Electronic Research Laboratory. The mainframe was realized with a drain of international expertise and training on-the- job of scientific staff. The head of the Laboratory, Mario Tchou, had a valuable experience in electronics in the U.S. and his collaborators, at first mainly Italian, were chosen for previous experience in pulse modulation methods. Elea 9003 was built with germanium diodes and transistors. They successfully sold the mainframe on the national market, but Olivetti electronic enterprise did not last. After the unexpected deaths of Adriano Olivetti (1960) and Mario Tchou (1961) there were inner contrasts in the management. Moreover, the national market was very limited and the Italian government did not help in any way the company. Therefore, in 1964 due to financial problems and shortsighted business strategies, Olivetti dismissed its main electronic assets and sold the Electronic Department to General Electric. However, the seeds of the work done by Olivetti Laboratory sprouted later on in computer science thanks to Programma 101, the first desktop computer.

**ASSIGNMENTS AS EDITOR**

2015 Parolini, Giuditta (September 2015) Guest editor of the special issue on experimentation in 20th century agricultural science for the journal *History and Philosophy of the Life Sciences*.

Tasks: Writing the introduction of the special issue and organising the peer-review process of the papers.


Tasks: Writing the introduction to the volume of proceedings, check the uniformity of the referencing system adopted by the authors.
Journal Articles

2015  Parolini, Giuditta (September 2015) In pursuit of a science of agriculture: the role of statistics in field experiments. Contribution for the special issue on experimentation in 20th century agricultural science to be submitted to the journal History and Philosophy of the Life Sciences.

Abstract
Since the beginning of the twentieth century statistics has reshaped the experimental cultures of agricultural research taking part in the subtle dialectic between the epistemic and the material that is proper of experimental systems. This transformation has become especially relevant in field trials and the paper will examine the British agricultural institution, Rothamsted Experimental Station, where the statistical methods nowadays popular in the planning and analysis of field experiments were developed during the 1920s. At Rothamsted statistics promoted randomisation over systematic arrangements, factorization over one-question trials, and emphasized the relevance of the experimental error in assessing field trials. These changes in methodology transformed as well the material culture of agricultural science and a new body, the Field Plots Committee, was created to manage the field research of the agricultural institution. Although successful, the vision of field experimentation proposed by the Rothamsted statisticians was not unproblematic. Experimental scientists closely linked to the farming community questioned it in favour of a field research more easily understandable by farmers. The clash between the two agendas reveals how the role attributed to statistics in field experimentation defined different pursuits of agricultural research, alternatively conceived as a scientists' science or a farmers' science.


Abstract
During the twentieth century statistical methods have transformed research in the experimental and social sciences. Qualitative evidence has largely been replaced by quantitative results and the tools of statistical inference have helped foster a new ideal of objectivity in scientific knowledge. The paper will investigate this transformation by considering the genesis of analysis of variance and experimental design, statistical methods nowadays taught in every elementary course of statistics for the experimental and social sciences. These methods were developed by the mathematician and geneticist R. A. Fisher during the 1920s, while he was working at Rothamsted Experimental Station, where agricultural research was in turn reshaped by Fisher's methods. Analysis of variance and experimental design required new practices and instruments in field and laboratory research, and imposed a redistribution of expertise among statisticians, experimental scientists and the farm staff. On the other hand the use of statistical methods in agricultural science called for a systematization of information management and made computing an activity integral to the experimental research done at Rothamsted, permanently integrating the statisticians' tools and expertise into the station research programme. Fisher's statistical methods did not remain confined within agricultural research and by the end of the 1950s they had come to stay in psychology, sociology, education, chemistry, medicine, engineering, economics, quality control, just to mention a few of the disciplines which adopted them.
BOOK REVIEWS

