

Chapter 9

Dynamics of Indian Forensic Science Research

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ABSTRACT

Science and technology are continuously changing as new discoveries and inventions are made. Research funding agencies, project directors, and individual researches need to keep a tab on these dynamics. This chapter tracks the research directions of forensic science for a period of thirty-eight years starting from 1975. Data for the analysis was obtained from SCOPUS bibliographic and citation database. Over the study period there was an exponential growth of forensic science literature and documentation. The United States of America contributed about one fourth of the research papers published while the most prolific author was Bruce Budowle (University of Texas). The majority of the contributors were from the non-governmental sector. The Journal of Forensic Sciences was the most productive journal during the study period in terms of number of published papers. It was also found that internationally collaborated papers attracted more citations.

INTRODUCTION

The dynamics of the academic world of science and technology keeps on changing the landscape characterized by the continuous emergence and development of new research directions, funding initiatives, scientific publications, and communication and collaboration networks (Etzkowitz & Lydesdorff, 2000). Science maps aid to represent and analyze the dynamic and changing scientific landscape. Science maps are multi-dimensional domain visualizations that represent specific characteristics like authorship, collaborations, citations, etc. related to a particular scientific domain. Maps representing collaborative networks such as, authorship collaboration, institutional collaboration, and international collaboration, scientometric analysis of scientific publications, research funding, and the evolution of scientific domains and its likely future course are some examples of science maps. Scientific and research publications provide a relevant point of entry to study the nature, trajectory, and structure of scientific fields (Noyons & van Raan, 1998).

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Science maps are generally constructed using bibliometric data consisting of a wide array of bibliographic information viz., authors, title, year of publication, source journal, page numbers, keywords, citations, publication type etc. These entities are used to generate unique maps representing different aspects of the relationships between and within scientific disciplines and research communities. Science map based on publication types (differentiating between types of journals for example) helps showcase the dominant disciplinary and research fields while a map based on co-occurrence of authors (two or more authors co-authoring a publication) represents the formulation and evolution of collaborative networks between disciplines and research communities (Bettencourta & Kaur, 2011). Science maps, thus, are useful tools to understand the state-of-the-art and disciplinary structure within an academic field as well as to analyze the emergence of research networks and collaborations. The focus of these maps is to offer insights into the specific subspecialties and the ways in which collaborative research networks can be sustained and developed further.

Scientometrics is one of the measuring and evaluating techniques used by the Library and Information Science professionals. Scientometricians use various mathematical and statistical techniques for the evaluation of scientific research. Scientometrics is a quantitative and qualitative measuring technique for evaluation and interpretation of science and its different activities such as productivity, progress, organization and management. Scientometric study is a statistical method of counting to evaluate and quantify the growth of a subject. The research trend during the said time span would be clearly understood from this study and a predictive projection may be made for anticipatable future.

EVOLUTION OF FORENSIC SCIENCE

The evolution of the practice of Forensic Science dates back to prehistoric period. Fingerprint patterns were used as the first means of establishing personal identity. The complex patterns inherent in fingerprints were noticed even by primitive man, as evidenced by their incorporation in prehistoric paintings and rock carvings (Ashbaugh, 2000). The use of fingerprints for identification by the Babylonians and later by the Chinese seems clear from the archaeological relics of clay tablets and other legal documents bearing the prints of interested parties (Morland, 1950). Indians studied various patterns of the papillary lines, thousands of years ago. It is presumed that they knew about the persistency and individuality of fingerprints, which they used as signatures (Nanda & Tewari, 2001). In the ancient *Sangam Age* Tamil literature '*Chilapathigaram*', Kannagi, wife of the wrongly convicted Kovalan confronts the Pandya King with an anklet as physical evidence and proved his innocence. In *The Holy Bible*, Solomon, the king of Israel, used the principles of psychology to adjudicate when two women claimed to be the mother of the same child.

However, Forensic Sciences in the present form have evolved during the end of 18th century, which marked the beginnings of modern chemistry. This opened the way for the birth of toxicology. The most illustrious figure in the history of toxicology was probably M.J.B.Orfila (1787-1853). One of the first systems of personal identification was based upon a series of body measurements. Its major proponent, Alphonse Bertillon (1853-1914) developed this system of anthropometry in order to establish an identification file suitable for use in criminal investigations. This system is also called Bertillonage. Employment of fingerprints as a device for personal identification grew out of the early efforts of William Herschel, a British civil servant in India in the 1870s, and of Henry Faulds, a Scottish physician who was working in Japan at around the same time (De Forest, Gaensslen & Lee, 1983).

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