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The origins of the concept of 'foresight' in science and technology: An insider's perspective

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ABSTRACT

This article explores how the term 'foresight' originally came to be used in connection with science and technology by the author and SPRU colleagues in 1983. It analyses how the rationale for its use evolved over time, first providing a 'catchy' title for a study ('Project Foresight'), and then a convenient shorthand for the focus of that study, before eventually coming to formally signify a new approach to looking systematically into the future of science and technology, an inclusive and wide-ranging process that differed appreciably from that of traditional 'technology forecasting'. The paper reflects on the importance of concepts and terminology in the field of science policy research, providing examples of how an inappropriate term or phrase can damn the prospects of the research having an impact on policy, while a more politically astute use of terminology can greatly enhance the probability of making a significant impact. The paper also examines other early uses of the concept of 'foresight' in the United States and Canada at about the same time. In addition, it highlights the conceptual similarities between foresight and *la prospective*, a novel approach developed in France not just for looking into the future but also for shaping or even 'constructing' the future of our choice, an ambitious aspiration that it shares with foresight. This case-study on the origins and early evolution of 'technology foresight' illustrates the essential importance of terminology in differentiating key concepts in social sciences (where it sometimes gives rise to unfortunate priority disputes), and particularly in the case of policy research.

1. Introduction

'Technology foresight' is a term now widely used by academic researchers, policy-makers, industrialists, consultants and others round the world, although less so perhaps in the United States. According to Google Scholar, there have been over 5000 academic articles employing this term, while Google itself registers over 90,000 'hits'.[1] When was the term 'foresight' first used in connection with science and technology to denote something different from traditional 'technology forecasting'? Ian Miles [1] has carried out a thorough review of the origins and early use of the concept of 'foresight', initially more generally with respect to futures work and later more specifically with regard to technology. This article should be read in conjunction with his review, offering the reflections of one who was centrally involved in the early work to develop the concept of 'foresight' and to differentiate it from 'forecasting' as well as in efforts to introduce it to the world of policy.

Terminology is vitally important in the social sciences. The emergence of a new term often heralds the identification of some new phenomenon, or at least the recognition of an existing phenomenon that, until now, has lain undetected by social scientists.

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[1] In both cases, these databases were accessed on 16 April 2010.

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Alternatively, it may relate to the development of a new concept, model or theory that provides a significantly improved understanding of an already acknowledged phenomenon in the social world. A new term may not infrequently be the subject of a priority dispute as to who identified the phenomenon, concept or whatever first. In addition, as this story reveals, terminology is especially important in the world of policy research, where a particular choice of phrasing may either greatly enhance the prospect of the work making a significant impact on policy or management practice, or alternatively may, for political or other reasons, ruin the chances of that research having any appreciable impact.

The original objective of this paper was to respond to the request of the editors of this special issue to set on record how and why the SPRU team of which I was part first came to adopt the terminology of 'foresight' in the Spring of 1983, and to analyse the evolving rationale for the use of this particular term as distinct from 'forecasting'. However, the paper also reflects more generally on the importance of concepts and terminology in the field of science policy research, providing specific examples of how this can substantially influence the impact on policy. In addition, I discuss my changing perceptions on the tangled issue of priority regarding the concept of 'foresight' with respect to other early users of the term in the United States and Canada, and in the light of the substantial conceptual and philosophical similarities with *la prospective*, the approach pioneered in France. This case-study of the origins and early evolution of technology foresight illustrates the essential importance of terminology in identifying key concepts in social sciences, and particularly in the case of policy research, as well as the often intractable problems of establishing intellectual priority.

The structure of this paper is as follows. Section 2 describes the background to the first SPRU study, 'Project Foresight', explaining why this particular terminology was adopted in 1983 in deference to the earlier 'Project Hindsight' and reflecting the fact that this new project essentially involved the 'mirror image' of what Project Hindsight had been trying do. Subsequently, however, SPRU adopted 'foresight' as a convenient form of shorthand for "the techniques, mechanisms and procedures for attempting to identify areas of basic research beginning to exhibit strategic potential" (Irvine and Martin [2], p.7), as I describe in Section 3. Later still, as we will see in section 4, the use of the term 'foresight' received another, much more substantial rationale, namely to differentiate certain recent anticipatory activities from those more traditional ones that went under the rubric of 'technology forecasting'. Section 5 considers the output from the original SPRU foresight study and why, with the particular terminology chosen for the subtitle of the resulting book, we were virtually guaranteed to have no impact on Mrs Thatcher's Conservative Government in the 1980s. Section 6 reviews other early uses of the 'foresight' terminology with regard to science and technology, while Section 7 examines the second SPRU report to the UK Government and explains how, having learnt from previous experiences, SPRU this time made sure that the terminology was more appropriate, enabling that report to have a major impact on subsequent UK policy. Finally, Section 8 discusses the main conclusions to be drawn from this case-study on the role of new concepts and terminology in social sciences and in policy research in particular.

2. Project Foresight

Early in 1983, the Advisory Council for Applied Research and Development (ACARD, an advisory body reporting to the UK Cabinet Office) set up a study group "to survey current scientific developments and advise the Council on work which showed commercial and economic promise for the medium to long term" (ACARD [3], p.7). As part of this, the Cabinet Office invited SPRU to bid for a study to survey the approaches adopted in other countries for looking into the longer-term future of science and technology in order to identify exploitable areas of research, and to identify what lessons the UK might draw from these. The decision to approach SPRU almost certainly reflected its prominent involvement in 'futures' research during the 1970s, in particular its critique of the influential book, *The Limits to Growth* [4].[2] John Irvine and I, who had previously been working on the issue of how to identify priorities in the area of 'big science' (and specifically high-energy physics [9]), and who were at that stage looking for funds, decided to prepare a proposal. In doing this, we received substantial help from colleagues who had been involved in the earlier SPRU 'futures' work, including Marie Jahoda, Ian Miles, Keith Pavitt and Tom Whiston.

The resulting proposal set out the specific objectives of the study:

a) to analyse attempts made in France, Germany, Japan, and the United States over the last 20 years to identify emerging areas of strategic research that at the time showed long-term promise of leading to significant commercial benefits;
b) to examine the role, if any, that these forecasts played in promoting such developments;
c) to evaluate retrospective studies tracing back the scientific origins of significant technological innovations in order to determine whether one could have predicted the subsequent economic impact of the preceding research. [10]

From the results thus obtained, "SPRU would then offer suggestions as to the approach that ACARD might adopt in their survey of promising scientific areas". [10] However, before it could be submitted, the proposal obviously had to be given a title. Even at this stage, it was clear that the study would give considerable attention to "retrospective studies tracing back the scientific origins of significant technological innovations". [10] Moreover, from our previous graduate studies (John Irvine at the University of Sussex and myself at the University of Manchester), we were aware that two of the most important retrospective studies were Projects Hindsight [11] and TRACES [12]. One of the iconic contributions of these two studies consists of various figures tracing back the scientific and technological origins of key innovations (in the military and civil sectors, respectively). It was apparent that what the ACARD study required was essentially the 'mirror image' of these figures – i.e. instead of taking a specific innovation and

[2] See, for example, the critiques by Cole et al. [5], Encel et al. [6], Clark and Cole [7] and Miles [8].