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Francis Crick, cross-worlds influencer: A narrative model to historicize big bioscience

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ABSTRACT

The essay is an empirical case study of famed British scientist Francis Crick. Viewing him as a 'cross-worlds influencer' who was moreover dedicated to a cause, I have tried to understand how these two characteristics influenced the trajectory of his long career and how they shaped his contributions to the diverse research fields in which he was active, and concluded that these characteristics reconfigure Crick's career into a coherent whole. First, I identify a major thread running through Crick's career: helping organise 'un-disciplined' new research fields, and show that his successive choices were not serendipitous but motivated by what he construed as a crusade against 'vitalism': anti-vitalism was a defining driver of his career. I then examine how Crick put his skills as a crossworlds influencer to the service of his cause, by helping organise his chosen fields of intervention. I argue that his activities as a cross-worlds influencer were an integral part of his way of 'doing science' and that his contributions to science, neuroscience in particular, should be re-evaluated in this light. This leads me to advance a possible strategy for historians to investigate big bioscience fields. Following Abir-Am, I propose to trace their genealogies back to the fluctuating semi-institutional gatherings and the institutional structures that sustained them. My research on Crick supports the view that such studies can bring insights into the question of why the contours of contemporary big bioscience endeavours have come to be shaped the way they are. Further, the essay provides a heuristic device for approaching these enquiries: 'follow the cross-worlds influencers' who worked to build and organise these semi-institutional gatherings and institutional structures.

1. Introduction

The unprecedented rise of large-scale, collaborative, multi-disciplinary 'Big Science' projects, in the wake of World War II, poses new challenges for archivists and historians of science. How to document them and write their history is much debated. One prominent difficulty is the large number and diversity of the participants involved, and the huge mass of data they produce. In our knowledge economies, humanities are encouraged to follow the growing trend towards 'Big Data' and develop tools and methods to exploit the vast volumes of data that 'Big Science' and information society generate. In history of science as in many other domains, data-driven research appears as a promising response to the challenges of the 'data deluge' caused by the overabundance of sources.[1] However, this approach does not go unchallenged (Scheinfeldt, 2012). Indeed, one overarching aim of the collection to which this essay belongs, is to propose other possible strategies to find a way into, and make sense of, the data-crowded labyrinths of the contemporary biosciences.

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[1] In the UK, Big Data is a cross-cutting 'vital part' of RCUK strategy: http://www.rcuk.ac.uk/research/infrastructure/big-data/. For the Arts and Humanities Research Council (AHRC), the Big Data research programme is at the core of 'Digital Transformations', one of the four AHRC strategic themes for 2013–2018: http://www.ahrc.ac.uk/Funding-Opportunities/Research-funding/Themes/Digital-Transformations/Pages/Big-Data.aspx. Links were last consulted 12/03/2015.

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In his contribution, Miguel García-Sancho argues that the main issue is not so much the proliferation of sources, as a lack of suitable narrative models (García-Sancho, 2016). This view is consistent with that of skeptics in other research fields who view the increasingly popular strategy of developing tools and methods for data-driven research as a substitute for theory-driven research, or, as the most radical would have it, as a substitute for thinking (Carandini, 2015; de Chadarevian, 2009; Fisher, 2015). Based on his experience researching the history of genomics, García-Sancho proposes to use the administrative archives of big science projects as alternatives to individual scientists' papers and to follow "the synthetic voice of the invisible administrator." He justifies this approach on the grounds that "[t]he brokering expertise of big science administrators, navigating among the many actors involved in the projects and harmonising their conflicting views, constitutes a privileged point of entrance into the rhizome of genomics." (García-Sancho, 2016).

This argument calls for two observations. First, García-Sancho's emphasis on the brokering expertise of big science administrators implies that the value of administrators as entry points into big science projects depends not so much on their administrative management skills as on their aptitude at 'managing by influence' across different social worlds. Influence has been the object of much attention in the business and management literature, especially in relation to leadership. Although much of this work has been published in the grey literature aimed at managers and top executives, political communicators, social marketers and the like,[2] it has also found its way into more scholarly publications.[3] Here, influence is commonly defined as the capacity to affect others' ideas, opinions and actions by intangible or indirect means, instead of through direct authority. Influence, it is commonly argued, is particularly important for roles of leadership in environments where the focus in on strategy and where the best way to accomplish objectives is through collaboration and persuasion, rather than directive, bureaucratic management. Major factors in influence include commitment to a vision, consistency in message, and other people's respect for and liking of the influencer. Of paramount importance is the ability to build and nurture interpersonal trust relationships, as a platform for influence (Cialdini, 2007; Kaufman, 2011).

In his argument, García-Sancho does not disentangle the distinct roles of the two forms of management, administration and influence, in the organisation of interdisciplinary, collaborative science. This is characteristic of much history and sociology of science. There have been few attempts to examine how the capacity to exert influence across different contexts, what I will term 'cross-worlds influencing,' contributes to the makeup of science, to the directions in which science develops, its organisation and practices. Still, there are noteworthy exceptions. The overarching goal of the collective volume *The Brokered World. Go-Betweens and Global Intelligence, 1770–1820* has been to bring to light "the largely ignored role of go-betweens in the very construction of [the] modern world, notably in the domain of knowledge and sciences." (Schaffer, Roberts, Raj, & Delbourgo, 2009) More relevant to our concern with contemporary big science, Shapin's study of the post-World War II scientist as institution builder and entrepreneur has shown that, in large collaborative and interdisciplinary projects, "the personal, the familiar, and even the charismatic" are ever more important to research management; that vision, inspiration, stimulation, encouragement, capacity to relate to various individualities and diverse research interests—all qualities that map onto the key components of influential leadership highlighted above—were far more importance for the flourishing of such research projects than well-oiled bureaucratic task management (Shapin, 2008, chapter 6 especially).

The sociology of science has paid some attention to skills relevant to cross-worlds influencing in relation to multidisciplinary big science. I have particularly in mind Harry Collins and Robert Evans' elaboration of the concept of 'interactional expertise' in their Studies of Experience and Expertise programme.[4] 'Interactional expertise' was initially conceived in the context of ethnographies of science and it was defined as "enough expertise to interact interestingly with participants and carry out a sociological analysis" as opposed to 'no expertise' ("insufficient to conduct a sociological analysis or do quasi-participatory fieldwork") and 'contributory expertise' ("enough expertise to contribute to the science of the field being analysed") (Collins & Evans, 2002, p. 254). The concept was subsequently generalized as "the product of a successful linguistic socialization. Although expressed as language alone, it cannot be too heavily stressed, interactional expertise is tacit knowledge-laden and context specific." (Collins, Evans, & Gorman, 2007, p. 661). In the Studies of Expertise and Experience programme, Collins has qualified his conception of language as 'practice language,' whose defining feature is "its substantive (often tacit) content," and has gone on to reconfigure 'contributory experts' as a subset of the class of 'interactional experts', further blurring the roles of language and practice in the definition of interactional expertise (Collins, 2011, pp. 274–276). In its extended version, 'interactional expertise' has been recognized as essential to the coordination of activities in a complex division of labour (Collins, 2011, p. 284) and it has been presented as a linchpin of 'fractionated trading zones', characterized as interdisciplinary partnership that "involves fractions of cultures as the medium of interchange … which are mediated by language largely in the absence of the material" (Collins et al., 2007, p. 660). Multidisciplinary and collaborative 'big science' fields are typical instances of such partnerships.[5] Coming back to my concern with cross-worlds influencing, interactional expertise—mastery of the tacit knowledge pertaining to a domain of expertise—is a major asset when engaging with the corresponding specialist community. In the case of big science projects, an individual who is able to develop interactional expertise in several of the research fields involved is in a position to play a privileged role brokering and building trust between distinct research groups, thus influencing the shape and direction of the collaboration. Coming from the sociology of social networks tradition, Ronald Burt reaches similar conclusions, arguing that 'between-group brokers' who exploit the 'structural holes' in a social network (i.e. brokers lying on weaker connections between densely clustered groups within the network) play a special role in generating social capital (Burt, 2001, 2002, 2004). On these premises, I will propose that beside project administrators, a wider and more diverse array of 'cross-worlds influencers' are worth pursuing as privileged 'entry points' into big science.

[2] See for instance: Cialdini (2007), Grenny, Patterson, Maxfield, McMillan, & Switzler (2013). http://www.forbes.com/2011/01/03/influence-persuasion-cooperation-leadership-managing-ccl.html; https://hbr.org/2008/02/exerting-influence-without-aut.html; http://carlsonschool.umn.edu/executive-education/programs/power-and-influence. All links last consulted 13/03/2015.

[3] See for instance Manning & Robertson (2003), Johnson-Cartee & Copeland (2004), Hoy & Smith (2007), Manning, Pogson, & Morrison (2008a, 2008b, 2008c), Kaufman (2011).

[4] See in particular, Collins & Evans (2002), Collins et al. (2007), Collins (2011).

[5] Even though Collins et al. (2007) point at gravitational waves research as a typical example, understandably considering the number of years that Collins has been involved with this field, the authors point that "… when examined closely, what appear to be integrated networks of scientists are really conglomerations of small groups bound together by rich interactional expertises." (Collins et al., 2007, p. 661) The domain of life sciences has proven an excellent candidate for the development of such 'big science' projects, due to complexity of the subject matter.