Introduction

Science policy, in common with most other aspects of public choice, is the result of a multistage and interactive exchange between the processes of determining purposes and setting goals, defining programmes and implementing them, and reforming rules and evaluating outcomes. Each of these processes is, in the first instance, influenced by the localized politics of institutions and actors that are directly concerned with the organization and conduct of scientific research.

Throughout much of its history, the localized politics of scientific institutions and actors have been separated from the wider society. In the early history of science, this separation was maintained by societal disinterest or hostility towards scientific enterprise. In more recent times, the separation has been maintained by a series of social contracts in which scientists preserved a degree of independence and received a growing share of social resources in exchange for services rendered to the education, defence and health of their fellow citizens and to industry.

In discussing science as a social institution it is also natural to recall that the institution of ‘patronage’ played an important early role. Patronage continues to appeal to many scientists’ desire for self-determination within a ‘republic of science’ whose institutions only partly overlap with those of the electoral democracies that have become the new patrons of science. Creating patronage for science, like other cultural institutions such as art and religion, involves appeals to aesthetic and ideological motivations. By adding claims of instrumental value, the republic of science has been able to expand well beyond the boundaries of charity.

Science’s claims to instrumental value are the quid pro quo for the social contracts that have allowed it to expand. The first major expansion began in the nineteenth century with the creation of the Humboldt model. This model recognized the capacity of science to contribute to national prosperity and regional development when it was practised in a university setting that allowed the young to benefit from the scientific explorations of their elders and, to varying degrees, participate in these investigations. The second major expansion occurred following the Second World War, involving not only the dramatic increase in university enrolment, but also the commissioning of research in both universities and ‘public’ laboratories. This second expansion was foreshadowed by experiments in establishing
public research institutions and in assigning specific research missions to universities, as early as the nineteenth century.

The history of the social contracts between science and government is the central theme of Ben Martin’s (Chapter 1) examination, which focuses on the Humboldt model and the changing role of the university as the principal public research institution. Martin argues that the second expansion may be subject to retrenchment as the democratic institutions of society rebalance priorities between public investments. Moreover, he notes that the Humboldt model has not been, and need not be, the universal model for the public funding of universities. Instead, he argues that, from their earliest history, different species of universities have existed and that universities may find ways to adapt to a retrenchment of the second expansion of universities and even a gradual change away from the dominance of the Humboldt model. In doing so, a greater variety of university species is likely to emerge patterned on the liberal arts colleges of the US and the grandes écoles of France.

The Commentaries of Keith Pavitt and David Wolfe contest Martin’s conclusions regarding a significant retrenchment from the second wave of university expansion. Both highlight the scale of the research enterprise that has been constructed in most of the Organisation for Economic Cooperation and Development (OECD) countries and the growing reliance on university research. Pavitt further questions whether the opinions that might lead to such a retrenchment are widely shared, attributing them instead to ‘simplistic’ views of public accountancy by government finance ministries. Pavitt and Wolfe both argue that universities have already achieved a central position in the knowledge-based economy as indicated both by the share of applied research that they conduct and by the continued enthusiasm of the larger companies for traditional models of university research. A substantial middle ground, in which major changes in the governance and funding of universities is possible, exists between the views of Martin and of Pavitt and Wolfe.

Michel Callon in Chapter 2 examines another facet of the republic of science, the question of who may qualify as a citizen of this republic. Callon contrasts the ‘confined researcher’ who has full citizenship rights and, more significantly, obligations with the ‘researcher in the wild’ who cannot endanger a citizenship that has never been granted. In a series of provocative examples, Callon reveals that researchers with full citizenship act not only to deny the scientific validity of non-citizen views, but also to deny them a voice in scientific debates.

These examples serve to highlight the potential for crisis in the governance of science. The legitimacy of science relies upon the perception that it has not been captured and confined by special interests. Public opinion
surveys reveal that society retains a high level of trust in scientists relative to other professions. In part, this is the consequence of the perceived autonomy of scientists. If this autonomy is being employed to deny the values of open inquiry that scientists espouse as a tenet of their profession, this trust is likely to evaporate.

A common fear of opening scientific discourse to more voices is that these voices will mislead or distort understandings that require a systematic grounding in the methods and findings of science. As many historians of science have demonstrated, however, the construction of scientific consensus involves the suppression of contesting views. The uncomfortable conclusion of Callon’s argument is that this process of suppression may also serve to de-legitimize and marginalize needed sources of variety in the discourse. The misleading conclusions and the distorted understandings thereby become the outcomes of the scientific discourse rather than what science dispels.

The third chapter in this part, by Patrick Llerena and Frieder Meyer-Krahmer, examines the changing geography of the republic of science. According to their argument the republic of science was once populated by disciplinary city-states whose walls provided safe havens for the production and circulation of knowledge. In recent years, however, the fields lying between these walls have proved to be more productive than the shops within the walls. One might then expect a migration outwards from disciplinary boundaries into the new interdisciplinary fields where opportunities await exploitation. In observations that recollect Callon’s evocation of the ‘confined’ researcher, however, this migration is impeded by the existing systems for evaluating researcher’s contributions and organizing research efforts.

Llerena and Meyer-Krahmer’s chapter offers persuasive evidence for the proposition that interdisciplinary fields have become a major source of scientific discovery. Exploiting their potential, however, involves more than the individual researcher seeking to tap it. It is necessary to assemble researchers with distinct competencies and to establish a new discourse between them. This can only be done, they argue, through institutional reforms that allow more flexible organization of research. In their case study of University Louis Pasteur (ULP) in Strasbourg, one of the most important institutional reforms is restructuring the linkage between teaching and research. This is accomplished at ULP by offering new courses of study at the postgraduate level and by systematically introducing students to the values and processes of interdisciplinary research in their postgraduate training.

The reforms that Llerena and Meyer-Krahmer describe have important implications for the organization and governance of research. They highlight
the importance of changing the criteria by which researcher performance is evaluated if disciplinary boundaries are to be overcome. They also indicate that interdisciplinary research involves the construction of new institutions that may need to be above a threshold size to achieve success. Assuming these conclusions are accurate, they have far-reaching consequences for the structure of funding of university research efforts.

The chapters in Part I share a common theme in considering the constraints that govern scientific enterprise. For Martin, these constraints arise from changes in the funding priorities of the state accompanied by growing demands to expand the delivery of teaching. These changes compel universities to evolve by making strategic choices within the constraints under which they must operate. For Callon, the constraints of central interest are those that the scientific establishment creates for itself by regulating the legitimacy of competing voices. Failing to mitigate these constraints may undermine the authority and trust that science holds in public opinion. For Llerena and Meyer-Krahmer, the constraints are the disciplinary rigidities that were erected to encourage rigour and to support the evaluation of researcher performance. In each of the chapters, however, it is also possible to see opportunities for responding to these constraints and this is their greatest contribution.