
6. CONCLUSION INSTITUTIONS, TECHNOLOGIES AND THE CHOICE OF EVOLUTIONARY METAPHORS

Yes, institutions do 'evolve' in a manner that shares important attributes with biological processes of evolution. But, affirming this to be true makes it all the more apposite for economists to grasp the implications of the view that biological mechanisms of selection are very much bounded by the material that they find already on hand. In the modern view, even the biological novelties for the most part are already 'on hand'; the gene pool already is carrying a large inventory of mutations—most of them for dysfunctional traits that, fortunately, remain recessive in the population—so that the generation of phenotypic innovations resembles nothing like a 'just-in-time' system of production. Rather than continuing in the Spencerian tradition of emphasizing evolutionary 'fitness' as the product of Darwinian competitions and conflating the latter with the metaphor of an 'invisible hand' that guides the development of organizations and institutions in the direction of ever-greater economic efficiency, students of the economics of institutions would be better served to keep in mind the image of the Panda's thumb. The latter—not anatomically a finger at all, much less an opposable, manipulating digit, but actually a complex structure formed by the marked enlargement of a bone that otherwise would be part of the animal's wrist—has been tellingly described by Gould (1980, Chapter 1) as a 'contraption, not a lovely contrivance'. In place of the invisible appendage celebrated by Adam Smith, the Panda's thumb metaphor offers institutional economics the paradigm of a serviceable but inelegant resultant of a path-dependent process of evolutionary improvisation, a structure whose obvious functional limitations stem from its remote accidental origins.¹¹

To sum up, my suggestion is that the many specific instances of path dependence involving institutional changes and their influence in economic history are understandable in terms that rather closely parallel the fundamental microeconomic conditions which I have identified elsewhere (see David, 1985, 1988, 1993b) as underlying the positive feedback dynamics typical of path-dependent processes involving technological evolution. When we probe beneath the facile view that institutions are self-evidently 'historical', it appears that history really matters

¹¹ For further development and application of this argument to the evolution of intellectual property institutions, see David (1993a).

where certain conditions obtain: (1) the durability of learned modes of communications and role types, (2) the multiplicity of solutions that may be found to yield coordination benefits and (3) the complementarities that are created when organizations ~~add~~ mutually adapted procedures, and institutions incrementally evolve precedent-based rule structures to maintain time consistency in expectations and minimize the obsolescence of organizational capital.

The parallels thus drawn, between the microeconomic conditions that cause institutions and organizations to be 'carriers of history' and the conditions that are found to underlie the phenomenon of path dependence in technological change, however, should not be projected all the way to the conclusion that 'institutions, after all, are just like technologies'. For some purposes, of course, it is helpful to emphasize structural properties between the two that are analogous: techniques of production, like organizations, can be conceptualized as rule structures that render the interactions of their constituent elements functional. Further, the problems that the rule structures solve may be seen in some instances to be closely similar, which justifies our speaking of the resemblance between human organizations and 'machine organizations', the latter being a descriptor applied usually to complex, distributed technical systems (e.g. parallel data-processing systems) that must solve coordination problems not unlike those encountered in social systems. But, one may logically recognize the shared quality of historicity in institutional and technological change without obfuscating the differences between the two that remain in other respects.

So, it will perhaps be best to bring this discussion to close by recalling that institutions and organizations, being required to coordinate the actions of volitional creatures for their functioning, are obliged to channel and direct the thinking of the human beings who are assigned to fulfil institutionalized roles, whereas purely technological systems (machine organizations) are not composed of sensate, volitional actors. Furthermore, organizational codes and information channels, filtering screens and like apparatus differ from the fixed capital goods that embody technologies, in that the former tend to work more smoothly (and with less attention to maintenance) the more intensively they are used, whereas machines and buildings eventually wear out with use and age. Institutions typically establish procedures for replacing their membership with new individuals who are selected to fit pre-defined roles, whereas purely technological (excluding the biotechnological) systems are not self-perpetuating and require human direction in order to reproduce themselves.

For these and still other reasons, institutions generally turn out to be considerably less 'plastic' than is technology and the range of diversity in innovations achieved by recombinations of existing elements is observed to be much broader in the case of the latter. Thus, institutional structures, being more rigid and less adept at passively adapting to the pressures of changing environments, create incentives for their members and directors to undertake to alter the external environment. Since there are many circumstances in which the external environment proves intractable, organizations and institutions are subject (in ways that properly designed technologies are not) to pressures and stresses that may cause them to abruptly collapse and dissolve or to be captured, dismembered and ingested by other competing organizations.

Finally, it may be remarked that because the extent of tacit knowledge required for the efficient functioning of a complex social organization is far greater—in relation to the extent of knowledge that exists in the form of explicit, codified information—than is the case for technological systems, institutional knowledge and the problem-solving techniques subsumed therein are more at risk of being lost when organizations collapse or are taken over and 'reformed' by rivals. Thus, we find the paradoxical state of affairs which contrasts with the more linear, cumulative progress of technological development: while some surviving institutions represent legacies of great antiquity, at the same time much human ingenuity and effort is continually being poured into reinvention and rediscovery of organizational techniques and institutional arrangements that have been lost and found several times over.

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