

unintended impact. Carroll and Gaston (1981:960), for instance, point out that although 'in practice, most occupational licensing laws attempt to increase the quality of inputs (qualifications of entrants into the profession or trade) in the belief that this will alter the quality of services actually received by consumers ... it is not at all clear that even a successful upgrading of inputs leads to a necessary increase in the quality of **service actually received by the consumer**' (original emphasis). Second, even if restrictions on entry do raise the quality of professional services, they provide an element of monopoly power to current practitioners in a particular occupational group. Thus, Milton Friedman (1962:148) argues that entry restrictions 'almost inevitably become a tool in the hands of special producer groups to obtain a monopoly position at the expense of the rest of the public'.

Alternatives to State Regulation

Such entry restrictions may be imposed in two ways. First, there is state-regulated licensure whereby the government imposes and enforces restrictions through the legal system. Second, under self-regulation, the state may confer monopoly power over the granting of occupational licences to representatives of an organised occupational group.

Whilst clearly recognising that 'Where standards and entry requirements for certification are set by a professional group, a privilege is conferred upon the group' (p.29), the authors of *Promoting Competition in Australia* nevertheless appear to favour self-regulation, provided 'that the self-regulatory, standard-setting processes of the professions be exposed to greater public scrutiny' (p.30).

Although at first glance this view seems more favourable to impersonal market forces than to government intervention, further reflection suggests otherwise. First, questions of quality aside, standard economic theory readily demonstrates that it is not possible to distinguish between state regulation and self-regulation by reference to the social costs attendant upon these alternative methods of occupational licensure (Dollery and Wallis, 1989). Consequently, the issue of self-regulation must be dealt with on a case-by-case basis. Second, an ostensible choice between state regulation and self-regulation conceals the fact that licensure itself it but one means among many of delivering professional services. The EPAC authors themselves refer (albeit in passing) to registration and certification as alternative institutional mechanisms (registration requires simply that the details of persons engaged in a given occupation be officially recorded, while certification provides evidence to potential consumers that prescribed training requirements have been obtained).

Given the existence of alternatives to licensure, and the possibilities of using licensure, certification, and registration in tandem in order to maximise consumer choice, it is a pity that these options were not explored more fully in the EPAC paper. One hopes that

the debate over professional services will invest rather more attention to the various intriguing possibilities of this kind.

References

- Arrow, K. (1963), 'Uncertainty and the Welfare Economics of Medical Care', *American Economic Review* 53: 941-73.
- Carroll, S. & R. Gaston (1981), 'Occupational Restrictions and the Quality of Service Received: Some Evidence', *Southern Economic Journal* 47: 959-76.
- Dollery, B. & J. Wallis (1989), 'Regulation and Occupational Licensure in Australia', *Economic Papers* 8: 36-46.
- Friedman, M. (1962), *Capitalism and Freedom*, University of Chicago Press.
- Merilees, W. & B. Quarrie (1988), 'Review of the Competitiveness of Professional Market', Economic Planning Advisory Council, Document No.02935.

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The effects of professional regulation are examined in Robert Albon & Greg Lindsay (eds), Occupational Regulation and the Public Interest: Competition or Monopoly?, CIS, 1984, and by John Logan et al., 'Competition in Regulated Markets', in Michael James (ed.), Regulating for Competition? Trade Practices Policy in a Changing Economy, CIS, 1989.

The Bureaucratic Function Algebraically Expressed: A Report on Loevinger's Finding

Warren Pengilly

CRITICISM of the bureaucracy may well have no real impact until it is put on a scientific basis. Most such criticism suffers from being purely pragmatic. But academia demands a theory before a debate can become serious. This may be a tragedy for debate, but if a theory is necessary one must be provided.

Over many years I have attempted to find a scientific expression that will convey all we know about the bureaucratic function. However, despite my efforts I

have been unable to improve on a breakthrough in 1968 by an American researcher, Lee Loevinger ('The Sociology of Bureaucracy', *The Business Economist*, November 1968, pp. 7-18). Loevinger is a former Assistant Attorney-General of the Antitrust Division of the US Department of Justice and also a former Commissioner of the US Federal Communications Commission. His bureaucratic credentials are thus immaculate. His equations have been arrived at after many years of observation and experimentation.

The sole purpose of this article is to publicise Loevinger's findings. Ancient as they are, they still constitute the major research in the field.

Loevinger believes that the bureaucracy functions according to three laws of sociodynamics, from which can be derived a formula that expresses the efficiency of the bureaucracy.

The Three Laws of Sociodynamics

The law of the dissipation of energy. This law states that as the number of people engaged in any project increases, the amount of energy dissipated in organisational chores increases and the average amount of work produced by each participant decreases. The net result is that the gross work output of a group increases in direct ratio to the square root of the number of persons engaged. Hence the law of the dissipation of energy can be expressed in the formula

$$W = \sqrt{N_p}$$

where W is the amount of work produced by the group and N_p is the number of persons engaged in the group effort.

The law of the conservation of entropy. In social as in physical phenomena, entropy is a measure of randomness, i.e. of disorder, uncertainty or confusion. The second law of sociodynamics states that the entropy regarding any social problem remains constant regardless of the number of organisations or agencies to which it is referred, while the time required for decision or action concerning the problem increases in geometric proportion to the number of agencies whose concurrence is required. The law can be expressed by the formula

$$T = (N_c)^2$$

where T is the time for decision, and N is the number of organisations or entities whose concurrence is required.

The law of the friction co-efficient of speech. In every organisation there is an interest resistance to institutional change, and the resistance to change in any segment of an organisation arising in response to vectors towards change from another segment constitutes friction. It is also the case that in social as in physical phenomena, to every action there is a reac-

tion. Sociodynamic analysis discloses that the organisational reaction to speeches and policy pronouncements by organisational heads is an increase in resistance to change, i.e. organisational friction. This law is expressed as

$$F \propto S \times 2P$$

where F is organisational friction, S is the number of speeches by the organisational head, and P is the number of policy pronouncements by the organisational head.

The Algebraic Expression

From these sociodynamic laws we can, Loevinger says, derive a formula that will permit us to measure the efficiency of a bureaucracy. The sociodynamic efficiency of an organisation is the work output per unit of time. By derivation from the foregoing laws, the efficiency of any bureaucratic organisation performing work can be measured by the following formula where E is the efficiency and the other symbols have the meanings ascribed to them in the foregoing laws:

$$E = \frac{\sqrt{N_p}}{(N_c)^2 \times (S \times 2P)}$$

Loevinger concludes from this that, since all bureaucratic organisations are basically similar and follow similar laws, regardless of form or objective, reorganisation necessarily changes little in a bureaucracy except the different levels of the people within it. Furthermore, the bigger the bureaucracy, the less gets done; and the more politicians claim they will fix a problem, the less likely it is that a solution will be found.

Loevinger's scientific study thus confirms what we have all experienced, and is therefore a massive contribution to our knowledge of the principles of public administration. Strangely enough, his work does not appear to have been discovered in Law Schools involved in Critical Legal Studies. As Loevinger rightly points out, bureaucracy is treated in Law Schools in time-honoured terms and conventions applicable to courts, legislatures and individual executives. Traditional legal analysis studies 'administrative law' rather than quantitative methods, statistical analyses and principles of group dynamics: all of these being techniques employed by the behavioural sciences.

This article may provoke amendments to, criticism of, or additions to Loevinger's equation. I am already running a number of experiments which I hope will expose some of the no doubt minor inadequacies of Loevinger's analysis.

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