

BEYOND THE PROBLEM OF LEGITIMACY: MILITARY INFLUENCES ON CIVILIAN SOCIETY

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The various relations between the military and technology are best discussed at a level intermediate between the micro-level of the individual and the macro-level of society as a whole. The *mesolevel*, as this intermediate dimension may be called, contains a variety of entities, from rural communities to institutional organizations, and from neighborhoods to cities, in which technologies range from the personal wrist-watch to the urban transit system. But of all these intermediate entities, organizations are of particular importance. This is true not only because when one speaks of "the military" one is actually referring to a complex population of organizations, specialized to fight on land, air, or sea, but more importantly because the influence that these organizations may have on civilian technology is often effected through changes in civilian organizations leading to particular *uses* of technology. In this essay I will concentrate on these organizational influences, and not as much on the technologies themselves. We must therefore start with the *theory of organizations*.

In the early twentieth century Max Weber laid down what would eventually become the foundation of this theory. He did this by exploring the different types of authority relations that coordinate social action in relatively large corporate groups, that is, groups that display an internal differentiation of roles with respect to authority. As is well known, he distinguished three basic types of authority, charismatic, traditional, and rational-legal, in terms of what made the exercise of control within an organization *legitimate*. That is, Weber stressed the fact that when control and coordination of activity involves the issuing of commands, those commands express a claim to legitimacy by those who issue them, and presuppose the acceptance of such claims by those who follow them. Charismatic legitimacy characterizes authority in small organizations (sects, guerrillas) based on the recognition that the person issuing commands has a right to do so because of certain personal characteristics: heroic actions, oratory prowess, triumphs in tests of strength. Traditional

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legitimacy derives from the history (real or mythological) of the organization itself, a history embodied in concrete rules governing the conduct of its members, the status of its leaders, and the rituals and ceremonies that provide a sense of continuity with the past. Finally, the rational-legal form of legitimacy is the form characterizing modern bureaucracies. The term "rational" is used in the sense in which economists use it: the ability to match means to ends. An organization gets this type of legitimacy if it can get things done. Thus, a government organization in charge of emergency relief will gain legitimacy if after a great disaster it can rapidly assist those who have been affected, and it will lose it if its response to the crisis is slow or incompetent. The term "legal" refers to the fact that the rules needed for coordination and control have been formalized and made less concrete than in the traditional type: their definitions are general and logically coherent, their jurisdiction explicitly specified, the cases they cover thought out in advance. In addition, authority becomes less personal than in the traditional and, specially, the charismatic types, with legitimacy attached to the role or office itself, quite independently of the personality or history of the incumbent. In short, this form of legitimacy emerges from the impersonal order itself.¹

In this essay I will be concerned with this last type of authority, which is characteristic not only of government agencies but also of other large hierarchical organizations, such as national and international corporations. I am in complete agreement with Weber as to the sources of the legitimacy in organizations but I would like to add, following the work of Michel Foucault, that the description of a legitimate order worked out in detail by jurists (and other creators of formal legality) needs to be complemented by a description of the other component of authority: *enforcement*. Prior to the eighteenth-century enforcement was a relatively simple activity, involving the use of physical punishment or confinement for specific acts of disobedience. But starting in that century more subtle forms of enforcement were introduced, in which obedience was ensured by the detailed shaping of the very activities needed to be coordinated in a large enterprise, and by the analytical partition of the spaces where such activities took place. These novel forms of enforcement have a quite a different historical origin than the rational-legal form of legitimacy. As Foucault writes:

“Historians of ideas usually attribute the dream of a perfect society to the philosophers and jurists of the eighteenth-century; but there was also a military dream of society; its fundamental reference was not to the state of nature, but to the meticulously subordinated cogs of a machine, not to the primal social contract, but to permanent coercions, not to

¹ MAX WEBER. THE THEORY OF SOCIAL AND ECONOMIC ORGANIZATION, 329-362 (New York: Free Press of Glencoe, 1964).

fundamental rights, but to indefinitely progressive forms of training, not to the general will but to automatic docility.... The Napoleonic regime was not far off and with it the form of state that was to survive it and, we must not forget, the foundations of which were laid not only by jurists, but also by soldiers, not only counselors of state, but also junior officers, not only the men of the courts, but also the men of the camps. The Roman reference that accompanied this formation certainly bears with it this double index: citizens and legionnaires, law and maneuvers. While jurists or philosophers were seeking in the pact a primal model for the construction or reconstruction of the social body, the soldiers and with them the technicians of discipline were elaborating procedures for the individual and collective coercion of bodies.”²

According to Foucault, the new system of enforcement had three components: strict spatial partitioning; ceaseless inspection; and permanent registration. When all three components were in place, the practices through which authority was enforced changed in organizations as different as prisons, hospitals, schools, barracks, and factories, that is, in organizations having the need to control large amounts of bodies confined transitorily or permanently. *Strict spatial partitioning* refers to the fact that every student had to be pinned to his desk, every patient to his bed, every worker to his station, every prisoner to his cell, and every soldier to his room. And the distribution of these fixed positions had to be designed to make identification and monitoring more efficient. *Ceaseless inspection* refers to the practices of monitoring themselves: while the doctor visit already existed prior to this organizational transformation, now it became lengthier and more regular. And similarly for the surveillance practiced by prison guards, drill sergeants, school supervisors, worker overseers. Finally, *permanent registration* refers to the fact that while before the eighteenth-century only the famous had their biographies committed to writing, once the new enforcement techniques were in place everyone had a written record: medical records, school and factory performance records, prison records, as well as the numerous other records that appeared later, such as driving records, insurance records, credit records and so on.³ This use of writing must be distinguished from its use in the formalization of rules and procedures which Weber discusses for the rational-legal form of legitimacy and from the sacred texts used to legitimize traditional authority. The idea of permanent registration refers to a *logistical* use of writing, that is, its use in the keeping track of the minute details of the day to day running of an organization based on imperative coordination of social activity.

² MICHEL FOUCAULT, *DISCIPLINE AND PUNISH: THE BIRTH OF PRISON*, 169 (New York: Vintage Books, 1979).

³ FOUCAULT, *Id.* at 195-196.

To understand the historical connection with the military, let's begin with the question of industrial discipline taken in its broadest sense, that is, to include not only the practices of monitoring the performance of workers on the job, and the punishment for violation of the rules, but also the shaping of their performance via optimized routines. Historians tend to think of Frederick Taylor, the late nineteenth century creator of "scientific management", as the pioneer of labor process analysis: the breaking down of a given factory practice into micro-movements and the streamlining of these movements for greater efficiency and centralized control. But Dutch commander Maurice of Nassau had already applied these methods to the training of his soldiers beginning in the 1560's. Maurice analyzed the activity of loading, aiming, and firing a musket into micro-movements, redesigned them for maximum efficiency, and then imposed them on his soldiers via daily drill.⁴ While the synchronized firing of weapons increased the soldiers' efficiency collectively, each individual soldier lost control of his actions in the battlefield. And a similar point applies to factory workers after Taylorism. Collectively they became more productive, generating the economies of scale so characteristic of twentieth-century big business, while simultaneously losing control of their individual actions. As Foucault puts it: "Discipline increases the forces of the body (in economic terms of utility) and diminishes these forces (in political terms of obedience)."⁵

But how can we argue for a connection between the daily drilling of soldiers and the industrial disciplining of workers when no direct genealogical link exists between the ideas and practices of Maurice of Nassau and those of Frederick Taylor? The answer is that such a link does exist and it was provided by French and American armories and arsenals in the eighteenth and nineteenth-centuries. The story begins in 1765 when a General of the French army, Jean Baptiste de Gribeauval, initiated a series of reforms in the production of French weaponry. The key idea was the creation of military equipment (such as gun carriages) with fully standardized components, such that any part produced in any of the different French arsenals would fit a given piece of equipment. This ideal of uniformity was born from the need to supply a battlefield with spare parts, a need that would remain unfulfilled as long as skilled artisans (who inevitably introduced idiosyncrasies into their products) were involved in the production process. Skills not only militated against uniformity they also endowed workers with a certain amount of control over the process, making the enforcement of obedience harder to achieve. Gribeauval's influence was crucial in pushing the organizational changes needed to create *weapons with interchangeable parts*: a standard model for all workers to

⁴ WILLIAM H. MCNEILL. THE PURSUIT OF POWER. TECHNOLOGY, ARMED FORCE AND SOCIETY SINCE A.D. 1000., 129 (Chicago: University of Chicago Press, 1982).

⁵ FOUCAULT, *supra* note 2 at 138.

copy; rigid inspections of the process; metallic gauges to check compliance with the standard. But as the historian Merrit Roe Smith writes:

“Gribeauval’s influence also manifested itself in another way. As Inspector General of Artillery, he had played an instrumental role in promoting the work of Honore Blanc, a talented armorer who had developed various labor-intensive methods of manufacturing muskets with uniform parts. Favored by Gribeauval’s patronage, Blanc had received approval to undertake experiments with the design and manufacture of small arms at several government installations. By the mid-1780’s he had tooled the Vincennes arsenal with novel die-forging, jig-filling, and hollow-milling techniques....These innovations held particular interest for American visitors. Thomas Jefferson, while serving as ambassador to Versailles, had visited Blanc in 1785 to witness the way in which the lock components of Blanc’s muskets could be randomly interchanged without any fitting or filling. Duly impressed by the demonstration, Jefferson wrote home about the experience and even tried to persuade Blanc to emigrate to the United States. Although the Frenchman declined Jefferson continued to monitor his activities and even shipped six of Blanc’s muskets to Philadelphia in 1789. One person who benefited from this diplomatic exchanges was Eli Whitney. Through correspondence and conversation with Jefferson, Secretary of Treasury Oliver Wolcott, and other government officials, Whitney evidently learned of Blanc’s work and tried to emulate it in filling his musket contracts with the War Department. Although his efforts fell short of success, he nonetheless became a zealous advocate of the uniformity principle, popularized the concept, and persuaded many politicians to support policies aimed at standardizing the manufacture of military arms.”⁶

In the mythology surrounding the history of what came to be known as the *American system of manufacturers*, Eli Whitney plays a central role: the individual entrepreneur pioneering a new labor-saving idea. But the actual history is quite different involving as actors not civilians working individually but a network of military officers and weapon factory superintendents working in the context of institutional organizations like the Ordnance Department and the Springfield and Harpers Ferry armories. The monitoring of armory operations had to achieve both fiscal and quality control. The former involved nothing more than the adoption of more sophisticated bookkeeping methods and the maintenance of detailed inventories of weapons and raw materials. This aspect of the question was understood and discussed by Weber as applying to any large economic enterprise with a rational-legal authority structure and was resolved rather rapidly in

⁶ MERRIT ROE SMITH, *ARMY ORDNANCE AND THE “AMERICAN SYSTEM” OF MANUFACTURING, 1815-1861*, in *MILITARY ENTERPRISE AND TECHNOLOGICAL CHANGE*, ED. BY MERRIT ROE SMITH, 47 (Cambridge: MIT Press, 1987).

the present case. But quality control of the product of armories demanded new ideas for the implementation of ceaseless inspection and permanent registration. As Smith writes:

“In 1816, the inspection of finished firearms varied not only from one armory to another but also within the same branches of the same armory. For the most part the procedure consisted in making qualitative comparisons with a pattern arm and its parts. That is, an inspector discovered work defects mainly by eye rather than instrument.... Other than a caliper to check the exterior dimensions of the gun barrel and two plugs to verify the bore, no gauges were used during the inspection.”⁷

Between 1823 and 1832, on the other hand, novel gauging methods had been introduced at the Springfield and Harpers Ferry armories. Acting as commands frozen in metal, steel gauges replaced the skill of the inspectors in the assessment of the quality of every single part of a weapon during and after the manufacturing process. Inspectors equipped with a master set of gauges could now systematically impose standards and enforce uniformity. The timing of the inspections was made more regular and written reports were produced registering any deficiencies in the process or the product, the conditions of the buildings and machines, the comparative degree of discipline at different establishments, and the performance of supervisory personnel.

These innovations were slowly transferred to civilian factories as contracts for arms production began to be granted to outside firms on the basis of their degree of participation in the uniformity system. In the 1840's the disciplinary innovations found other channels of diffusion. In some cases “former ordnance officers ... assumed managerial posts with various firearms, foundry, and railroad businesses. Far more frequently, however, armory practice was transmitted by workmen who had received their early training at one of the public or private arms factories and subsequently moved to new positions as master machinists and production supervisors at other manufacturing establishments.”⁸By the late 1850's the basic components of the American system could be found in organizations producing everything from sewing machines, pocket watches, and railroad equipment, and later on typewriters, bicycles and many other machined metal products. Although strict interchangeability of parts was not enforced as thoroughly as in armories, ceaseless inspection and permanent registration became an integral part of the means to enforce obedience in all these other places. And similarly for the third component of the new enforcement practices: spatial partitioning. The analytical use of space, in which group concentrations are avoided and individuals are

⁷ SMITH, *Id.* at 61-68.

⁸ SMITH, *Id.* at 77.

assigned their proper places, had an ideal model in the military camp, which as Foucault says, “was to the rather shameful art of surveillance what the dark room was to the great science of optics.”⁹ But as Foucault goes on to argue, not just barracks but hospitals, schools, prisons and factories became, through the very architecture of their buildings, veritable *behavioral microscopes*, making possible the production of certain discourses, from criminology and clinical medicine to pedagogy and the scientific management techniques of Frederick Taylor.¹⁰

Weber had already pointed out that the rational-legal form of imperative coordination involved knowledge as a crucial component. But this referred to the technical competence of those occupying official positions (accountants, engineers, managers) as a source of their claims to legitimacy.¹¹ But Foucault adds to this a second role for knowledge which is not concerned with the legitimacy of those who issue commands but with the behavioral details of those who must follow them. The concentration of knowledge at the top coupled with the routinization of activities at the bottom, worked together to make the authority of officers, doctors, teachers, prison guards, and work floor supervisors, more enforceable. This coupling is particularly evident in Taylor’s studies of labor processes. Even when his optimized procedures did reduce the physical effort needed to carry out a given task, the elimination of flexible skills and their replacement by rigid routines had as a result a net transfer of control of the production process from workers to managers. As Merrit Roe Smith writes: “When labor was mechanized and divided in nineteenth century arms factories, individual work assignments became more simplified while the overall production process became more complex. Coordinating and controlling the flow of work from one manufacturing stage to another therefore became vital and, in the eyes of factory masters, demanded closely regulated on-the-job behavior. Under these conditions the engineering of people assumed an importance equal to the engineering of materials. As conformity supplanted individuality in the workplace, craft skills and other preindustrial traditions became a detriment to production.”¹²

Let's add one final detail to this story of the influence of military organizations on civilian ones: the effects on management practices. Much as skills were replaced by commands in the shop floor, so were prices

⁹ FOUCAULT, *supra* note 2 at 172.

¹⁰ FOUCAULT, *supra* note 2 at 224.

¹¹ WEBER, *supra* note 1 at 335.

¹² SMITH, *supra* note 6 at 79.

replaced by commands at the management level. The first American big business was the railroad industry, an industrial sector that developed the management techniques which many other large enterprises would adopt later on. This much is well known. What is not so well known is that military engineers were deeply involved in the creation of the first railroads in the United States and that they developed many of the features of management which later on came to characterize just about every large commercial and industrial enterprise. In the words of the historian Charles O'Connell:

"As the railroads evolved and expanded, they began to exhibit structural and procedural characteristics that bore a remarkable resemblance to those of the Army. Both organizations erected complicated management hierarchies to coordinate and control a variety of functionally diverse, geographically separated corporate activities. Both created specialized staff bureaus to provide a range of technical and logistical support services. Both divided corporate authority and responsibility between line and staff agencies and officers and then adopted elaborate written regulations that codified the relationship between them. Both established formal guidelines to govern routine activities and instituted standardized reporting and accounting procedures and forms to provide corporate headquarters with detailed financial and operational information which flowed along carefully defined lines of communication."¹³

So far I have argued from a strict genealogical point of view. That is, the strength of the argument has depended on tracing actual historical links between military and civilian organizations. But there may also be regular patterns that reappear in the practices of organizations that are not connected historically. That is, regular patterns that emerge not from direct influences but from *convergences* produced by shared problems and solutions. One aspect of organizations that creates such convergences is *large scale*, in addition to the already mentioned need to control people confined, transitorily or permanently, in a building. Perhaps one reason why military organizations cast such a large historical shadow is that it was in armies that the effects of large scale were first clearly displayed. Armies grew enormously starting in the seventeenth-century, and by the middle of the eighteenth they had to be broken up into separate *divisions*: smaller groups of soldiers with their own infantry, artillery, and cavalry. A similar process occurred in industrial organizations in the twentieth century: to cope with its unmanageable large size, General Motors broke itself up into three separate divisions, each with its own product line and its own managers, accountants, engineers, and designers, becoming in the process the first multi-divisional corporation. Convergences due to large scale may explain some apparent exceptions to the thesis of a strict military origin of the American system of

¹³ CHARLES F. O'CONNELL, JR., THE CORPS OF ENGINEERS AND THE RISE OF MODERN MANAGEMENT, in MILITARY ENTERPRISE AND TECHNOLOGICAL CHANGE, ED. BY MERRIT ROE SMITH, 88 (Cambridge: MIT Press, 1987).

manufacturers. The historian Donald R. Hoke, for example, has argued that, in some cases, the very nature of a product may force the adoption of a disciplinary approach on purely technical grounds: standardization and routinization may be adopted to meet certain challenges posed by the production of complex mechanisms, quite independently of its effects on obedience, as in the case of early wooden clock manufacture, operating on the putting-out system (which antedated concentrated factory production). But his other counterexamples are all large scale enterprises illustrating convergent solutions to shared problems.¹⁴

Given the importance that enforcement practices based on spatial partitioning, ceaseless inspection, and permanent registration have had on the history of both military and civilian organizations, one may wonder why it took so long for us to theorize this aspect of modern authority. The preeminence of the problematic of legitimacy over that of enforcement can only partially account for this neglect. A better explanation was already hinted at above: much of human science is concentrated at either the highest (macro) or the lowest (micro) social levels. Thus, economics began as micro-economics, focusing on individual decision-makers, while sociology began as macro-sociology, studying society as a whole. Later on, an entire country's economy became the central problem of macro-economics, while sociologists turned to phenomenology to give birth to micro-sociology. The intermediate meso-level was not entirely neglected, as witnessed by the work of Max Weber on socio-economics, but it never got the same amount of resources as the other two levels. Things are beginning to change and we must thank historians for this. In particular, the work of Fernand Braudel on economic history has introduced the notion of *society as a set of sets*.¹⁵ What Braudel means by this is that a country must be viewed not as a monolithic entity but as consisting of a set of provinces, each with its own distinct history and culture. The space occupied by every province must be thought, in turn, as structured by a set of urban centers of different size, each of which contains its own set of organizations and communities.¹⁶ This way, the meso-level can be introduced in a principled way, with each of its components having its own historical tempo. As far as economic history is concerned, conceiving society as a set of sets implies a rejection of "the capitalist system". As he writes:

¹⁴ DONALD R. HOKE, *INGENIOUS YANKEES: THE RISE OF THE AMERICAN SYSTEM OF MANUFACTURERS IN THE PRIVATE SECTOR* (New York: Columbia University Press, 1990).

¹⁵ FERNAND BRAUDEL, *THE WHEELS OF COMMERCE*, 458-459 (New York: Harper and Row, 1982).

¹⁶ MANUEL DELANDA, *A NEW PHILOSOPHY OF SOCIETY* (London: Continuum, 2006).

"So we should not be too quick to assume that capitalism embraces the whole of Western society, that it accounts for every stitch in the social fabric."¹⁷

Braudel uses the term "capitalism" to refer exclusively to economic organizations that strictly speaking do not form part of a market economy, either because they rely on commands more than prices, or because they have the ability to manipulate the forces of demand and supply, rather than being governed by them. Both of these characteristics depend on large scale, and in many instances, on having adopted a militarized style of production. Braudel has shown that as far back as the fourteenth and fifteenth centuries, institutions with the capability of exercising economic power (large banks, wholesalers, long-distance trade companies) were already in operation, and fully coexisted with feudal institutions as well as with economic institutions that did not have economic power, such as retailers and producers of humble goods. Braudel did not live to witness the financial crisis that engulfed the world in 2008, but he would have smiled at the phrases that became common to describe it, phrases like "Too big to fail" or "Privatizing profits while socializing losses." Phrases like these should be more than enough reason to make an unequivocal distinction between the market economy and capitalism, given that if a firm can pass its losses to tax payers because its demise would sink a country's economy, it can hardly be said to belong to a market ruled by impersonal forces.

Let me conclude this essay by arguing that the question of the military influence on technology should be framed not in terms of the production of particular technological objects but of the transferring of industrial processes to the civilian sector. Napoleon's support for the canned food industry, for example, may have benefited the civilian as well as the military world, as the same is true of other technological objects of military origin, like the internet. Objects with interchangeable parts are not in themselves problematic, but the industrial discipline needed to create such objects is: it transfers to the civilian world the whole command and control structure characteristic of military organizations. Using the contract system to propagate the American system of manufacturers meant concentrating on capital-intensive processes, centralized decision-making, and close monitoring and supervision procedures, slowly extending these methods from direct weapons suppliers to the entire industry. It is possible that the methods characterizing economies of scale could have emerged through convergence, but the historical record shows plenty of direct influence. Either way, the question of the military influence on technology will remain hard to answer

¹⁷ FERNAND BRAUDEL, *THE PERSPECTIVE OF THE WORLD*, 630 (New York: Harper and Row, 1986).

if we neglect the study of the enforcement of authority in organizations, and continue to believe that the only problematic aspect of authority is the sources of its legitimacy.