

## Making Sense of the Systems of Scientific Management

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Though full of new work, *Le Libellio* has regularly and helpfully brought our attention to long-published books, some long forgotten but worth recalling and others well-remembered but worth revisiting. *Le Libellio*'s own anniversary in 2015 offers the opportunity to acknowledge another anniversary and to look at related publications: this year is the centenary of the death of Frederick Winslow Taylor, who died in 1915 as “Taylorism” and “management science” were establishing their enduring influence over organizational theory and practice<sup>1</sup>.

Taylor's work does not, of course, lie among the “forgotten”. Its supporters today may not be as enthusiastic as Peter Drucker, who claimed Taylor represented “*the most powerful as well as the most lasting contribution America has made to Western thought since the Federalist Papers*” (Drucker, 1954, p. 230). Nonetheless, whatever flavour it comes in—post-Taylorism, neo-Taylorism, or just plain Taylorism—“scientific management”, though it is often unacknowledged, underpins a good deal of current organizational theory and practice. While Ford and Michelin introduced aspects of Taylorism into the production line a century ago, Amazon's current work with robots, drones, and “Mechanical Turk” brings neo-Taylorism to the warehouse, the skies, and even the “digerati”.

At the heart of Taylorism lies the division of labor: between management and “workmen” or employer and “employé”, in Taylor's terms, or between the “head” and the “hands” in the Cartesian categories of Taylor's predecessors. The “head” was expected to think and give instructions while the “hands” mindlessly carried out its commands. Such a view was not new with Taylor. Adam Smith's contemporary Adam Ferguson had argued that

[m]any mechanical arts [...] succeed best under a total suppression of sentiment and reason, and ignorance is the mother of industry. [...] Manufactures [...] prosper most when the mind is least consulted; and where the workshop may [...] be considered as an engine, the parts of which are men. (Ferguson, 1767, 280)

Charles Babbage, the computer pioneer, later argued that “[o]ne great advantage which we may derive from machinery is from the check which it affords against the inattention, the idleness, or the dishonesty of human agents” (Babbage, 1835, p. 54). From such views it is easy to develop the idea that, if you cannot get machines to do the work, then at least you should try to get people to behave mechanically.

In *The Principles of Scientific Management* (1919), Taylor builds on Babbage's underlying distrust of workers with his discussion of “soldiering”, the practice of

1. Andrew Abbott (2009, p. 507) gracefully argues that “Although the past is always ready to teach, anniversaries help us choose which of its classes to attend”.

2. Further quotations from this edition are cited by page number alone.

3. For discussions of workers “soldiering” in opposition to management, see Burawoy (2001) and the works of Donald Roy that he discusses. See also Duguid (2006).

4. Taylor suggests, moreover, that the principles of “scientific management” may in turn spread through society to homes, farms, business, churches, philanthropic institutions, universities, and governmental departments (Taylor, 1919, p. 8).

5. See Hirschman (1977) for a historical account of homeostatic assumptions in economics.

deliberately slowing down the pace of work, which Taylor suggests might be pervasive, noting it is the same as “*‘hanging it out’, as it is called in England, ‘ca canae’, as it is called in Scotland*” (p. 13)<sup>2</sup>. Some have portrayed this pervasive resistance as the result of an inevitable opposition between the interests of management and of workers<sup>3</sup>. But Taylor portrays it as the result of defective systems of management and communication, arguing that if the workplace were made scientifically coherent, then workers would understand that the “*true interests of the two [i.e., workers and management] are one and the same*” (p. 10). Successful scientific management, furthermore, would not limit such enlightenment to the workers alone, but extend it to society at large: “*in the end the people through enlightened public opinion will force the new order of things [i.e., scientific management] upon both employer and employe*” (p. 139). This “*new order of things*” would produce a “*complete revolution in [workers’] mental attitudes and habits*” (p. 137) that would irresistibly result in “*harmony*”, both in the workplace, and in society at large<sup>4</sup>.

Within Taylorism, then, lies the idea that widespread communication of the findings of scientific management would overcome principal-agent problems and create an enlightened social system in which everyone—employers and employees, heads and hands—would know their place and their duty. Workers would have a clear idea of what was expected of them, they would appreciate the fairness of the wage that management would be compelled to pay them, and consequently they would work productively and harmoniously. Here we have one more instance of those grand, homeostatic visions of sociological and economic theory, underpinned by information<sup>5</sup>.

Taylor’s vision is rather blurred, however, producing two conflicting accounts that are never reconciled. In one, as noted, he suggests that management can avoid confrontation by informing the workers and making them see sense. But, elsewhere, following more closely the direction Ferguson had mapped, Taylor seeks to overcome the confrontation by reducing workers to an active but senseless part of the “engine”. Hence Taylor at different times describes his ideal agent as little more than an “ox” or a “gorilla”, a living machine guided in each minute movement by management control. From this perspective, management resolves the principal-agent problem not by reasoning with the agents but by removing their agency. While the first account portrays workers (and society at large) as capable of enlightenment and thus harmony, in the second, management fiat is justified by denying workers intellectual capability or good sense.

The first, generous account of human sense occurs in occasional and underspecified visions of organizational “*[h]armony, not discord*” (p. 140). It is discord, however, that occupies most of the discussion, and Taylor specifies in far greater detail the “*substitution of a science for the individual judgment of the workman*” (p. 114), reducing the workplace to “*rules, laws, and formulae*” (p. 38) and in the process subordinating the individual to the needs of the system: “*In the past, man has been first; in the future the system must be first*” (p. 7).

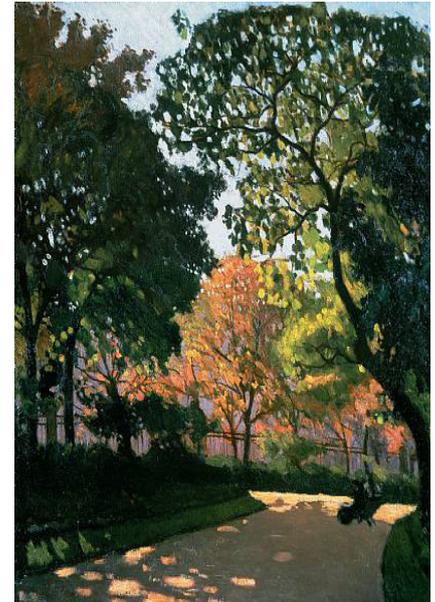
The key words in this succinct summary of Taylor’s arguments are *science* and *system* along with notions of irresistible *laws* and *formulae*. An essay from one of his colleagues, the engineer Frederick Feiker, lays out “*What Scientific Management Is*”: “[j]ust as the scientist in a laboratory tears apart a complex substance, finds its different constituents, [...] so the man who would practice ‘scientific’ management analyzes his work” (Feiker, 1911, p. 10). By rejecting the crude “rules of thumb” used elsewhere and adopting instead this scientific approach, Taylor argues, it is possible to discover

the “*one best method*” (p. 25) by which the “system” should be built and work carried out.

But this scientific view raises the question of how such a method can be introduced into the workplace, a question that leads to Taylor’s problematic division. On some occasions Taylor backs away from the claims for an esoteric “science”, arguing that “[i]n almost all cases [...] laws or rules which are developed are so simple that the average man would hardly dignify them with the name of a science”. This self-deprecating view supports Taylor’s account of communication, shared understanding, and “harmony”. But elsewhere, Taylor claims to the contrary that the “*science which underlies each act of each workman is so great [...] that the workman who is best suited actually to do this work is incapable of fully understanding this science*” (pp. 25-26; see also p. 41). Now we must assume that the “average man” of the earlier quotation would fail not merely to dignify the laws with the name of a science, but also to understand the laws and their significance at all. Indeed, on most occasions, particularly in his Congressional testimony, Taylor (1947) uses the term *science* to insist on the inscrutable authority of the scientist, and to put the scientific findings that he and his colleagues reach as far above questioning as above understanding<sup>6</sup>. If the worker is incapable of understanding, this argument implies, then scientific managers are entitled to resort to methods of technocratic control without explanation or justification.

Taylor thus moves back and forth between ideas of the intelligibility or the inscrutability of scientific management’s findings. At times, he proudly insists on the insights he gained from his own experiences working in factories and claims that what he learned there led him to scientific management. Elsewhere, he suggests that workers do not and cannot learn in work. Equally, while he denigrates workers for blindly following rules of thumb, he has no doubt that they should follow—even blindly follow—his scientific rules. Furthermore, if indeed work is made up of readily specifiable rules and measurable targets, the hierarchical organization, in which Taylor locates these rules and which requires his scientific management, itself comes into question. After all, the firm, in standard economic and management theory, results from the difficulty of specifying work and subjecting it to accurate measurement, and so to contract. Ronald Coase (1937) suggested that if the market is transactionally transparent we will lose the hierarchy, but Taylor expects to have both.

In all, though championing the system and the organization over the individual, Taylor’s “science” has no room for the complexities of social systems. His organizations, like the work and workers they contain, are machines, made up of isolated parts coordinated by rules and laws. Hence, the “*ordinary common sense*” (p. 87) deprecated in scientific management looks very different from the sort of organizational sense making proposed by, for example, Karl Weick (whose *Sensemaking in Organizations* (1995) also celebrates an anniversary this year). Weick tries to show the power of social, context-dependent learning and practice. Yet scientific managers would expect to reduce these to rules. Taylor had no place for claims of his contemporaries such as the tobacco baron James Duke, who recognized that his employees “*knew more about manufacturing tobacco than the man that owned the business*” (Fisk, 2009, p. 127). While in the modern firm Taylor’s approach could not



*Le jardin du Luxembourg,  
Albert Marquet (1903)*

6. On one occasion Taylor (1919, p. 109) gives mathematical equations but does not bother to include definitions of the variables, suggesting that the equations are there to intimidate rather than to enlighten.

countenance the insight from Julian Orr's work (1996) that workers can occasionally save management from its own ignorance by having the sense to break the rules that they are ordered to work by<sup>7</sup>.

7. See Duguid (2007).

Nonetheless, Taylorism is still with us, drawing new power from the replacement of Taylor's tools of watch and slide rule with digital technology. "Big data" and algorithms now contribute to the "*science which underlies each act of each workman*" (p. 25) and encourage renewed belief in "one best" and scientifically managed system. They also contribute to profound divisions between principal and agent that, like Taylorism, propose to leave the latter increasingly agentless in a rule-bound workplace<sup>8</sup>.

8. For account of Amazon warehouses see Head (2014).

For example, in their celebration of these new devices, *The Second Machine Age*, the management theorists Erik Brynjolfsson and Andrew McAfee (2014) argue that where the machines of the first age (the era of Adam Smith) were used to replace muscle, those of the second will replace mental labor. The hope has a long history. Ferguson (1767) suggested that thinking was becoming merely a "peculiar craft" (p. 281); Babbage (building on the insights of the Polytechnicien Gaspar Prony) held that "the division of labor can be applied with equal success to mental as to mechanical operations" (Babbage, 1835, p. 191); while in expanding the scope of scientific management, Taylor himself suggested that scientific rules should control the surgeon in much the same way as they control the ordinary workman (p. 114).



Rue Saint-Honoré,  
Camille Pissaro (1897)

Yet, while they echo these aspects of Taylor's theory, writers like Brynjolfsson and McAfee lack any of Taylor's optimism about the harmony that will result from the scientific management of labor. Implicitly aligning themselves with Taylor's account of workers as incapable of understanding their own best interests, Brynjolfsson & McAfee (2014, p. 146) foresee that the new rules will bring a new "*set of winners and losers*", the latter unprotected by any kind of homeostatic feedback or invisible hand. Similarly, the economist Tyler Cowen in *Average is Over* (2013) argues that the new economic conditions will divide society financially and socially

more profoundly than ever before. Unlike, for example Thomas Piketty (2014), who makes a similar prognosis, Cowen enthusiastically supports such an outcome, and where even Taylor argued that scientific management could save the "losers", Cowen raises the prospect that management-imposed, Tayloristic rules will lead not to harmony, but to a "*hyper-meritocracy*" (Cowen, 2013, p. 25).

Such accounts of the results of a rule-driven future lean heavily to one side of the division that we have seen within Taylor's views of human understanding, away from those moments when he attributes agency to those on the agency side of the principal-agent debate towards the occasions in which he asserts that the agents are incapable of much sense making at all and should thus be denied agency. Modern arguments about science, information technology, and economic behavior need to confront this division. Are we capable of communicating in such a way as to create that economic ideal of information symmetry (a hard concept to grasp, but one on which arguments about the potential efficiency of markets tend to be based)?<sup>9</sup> Or is the science of management unintelligible to those who must obey its rules and enact its laws? Ultimately, is the information of work inherently asymmetrical and will such asymmetry reduce the agency of agents while exponentially increasing the principal of principles?

9. See Akerlof (1970), whose powerful idea of "information asymmetry" inevitably calls on us to contemplate the possibility of symmetry.

In all, those encoding rules, laws, and instructions in management science and its complex algorithms on the assumption that these must be obeyed rather than understood may implicitly invoke not only Taylor, but also another, very different nineteenth-century figure, the English poet Percy Shelley. Shelley (1840, p. 57) referred to poets as the “unacknowledged legislators of the world”. Increasingly, the phrase seems applicable to those writing code for management systems. Similarly, we might think of authors like Brynjolfsson, McAfee, and Cowen, who do not mention Taylor but who recreate much of his technocratic thinking, though less of his social idealism, as unacknowledged Taylorists. In both cases, it is important that we acknowledge the unacknowledged and question the rules of thumb embedded in both their science and their systems—no doubt paradoxically invoking the authority of Taylor as our justification for doing so ■

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