Wichard von Moellendorff, "Efficiency," *Zeitschrift des Vereines Deutscher Ingenieure* 64 (16 October 1920): 853-856.

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In contrast to many words in modern specialist languages "efficiency" means something general, taken for granted, namely the degree of effect [*Wirkungsgrad*], referring to an accompanying cause of similar kind and similar mass. Philologically "efficiency" can be praised for being constructed in good German without violence and yet forming a smooth bridge to the Anglo-Saxon, internationally used *efficiency*, and philosophically it even deserves respect for a quite unusual precision that stands out advantageously from the conceptual confusion of expressions like "labor," "productivity," "value," etc.

Although we find ourselves in a Hegel memorial year, I will reach back to Schopenhauer, whose chief work on *The World as Will and Representation* and whose essays *On the Fourfold Root of the Principle of Sufficient Reason* or *On the Will in Nature* are and will remain not only a kind of treasure trove but absolutely foundations of the scientific sense of order. Just like Schopenhauer was ridiculed by the contemporary popes of learnedness as a dilettante outsider, so will the engineer be dogged by the scorn of long-established guild professors as soon as he ventures out of their preserve to get at the truth.

Let it be about this: Provided it is only truth that we are gathering in this way, the Association initiative that summoned us together here today—counter to earlier tradition—is to be greeted with gratitude, so that we can vault over the sphere of specialist reports to the latest questions of our profession. We engineers, we who justly wanted to be sure to persist in sobriety, we who experience salutary fright at the fact that by means of expert simplemindedness we have wrongly distanced ourselves disturbingly far from belonging to a worldview, we engineers, we, too, are starting to turn around and once again to seek out realms that alienated us, even that of philosophy. We want to know again how *Technik* coheres internally in its parts and externally with the world-as-totality.

Naturally it cannot be my intention to exhaust this theme in the course of this lecture. It is entirely questionable whether one person should ever answer for another in the end. But to prompt the other to his own answer: that he should do, and that is why I have chosen "efficiency" as my guide. With its help I have at least been able to mark out passageways in the maze of slumbering problems; for its escort always leads back directly to the philosophical clearing, and forward to the philosophically uncleared ancient forest of our praxis.

Please do not think ill of me for presuming little and going far afield with broad strokes: According to Schopenhauer there are four kinds of sequences of cause and effect and thereby four kinds of necessities, namely: "1) *Logical necessity*, according to the principle of sufficient reason of knowing, in virtue of which, when once we have admitted the premises, we must absolutely admit the conclusion. 2) *Mathematical necessity*, according to the principle of sufficient reason of being, in virtue of which, every relation which is stated in a true geometrical theorem, is as that theorem affirms it to be, and every correct calculation remains irrefutable. 3) *Physical necessity*, according to the law of causality, in virtue of which, as soon as the cause presents itself, the effect must infallibly follow. 4) *Moral necessity*, in virtue of which, every human being, every animal even, is *compelled*,

as soon as a motive presents itself, to do that which alone is in accordance with the inborn and immutable character of the individual."[1]

This orientation is not to be used as if partitions lay between the disciplines of human research and activity because of it. Logic in turn is much more inseparably bound to every science, especially to every classificatory science. Physics and chemistry, in which causality predominates, nonetheless cannot do without mathematics. Indeed, all fruitful science harbors in itself all four forms of the principle of sufficient reason, in that it strives after philosophy; "Empirical sciences pursued purely for their own sake and without philosophical tendency are like a face without eyes. They are, however, a suitable occupation for men of good capacity [*who yet lack the highest faculties, which would even be a hindrance to minute investigations of such a kind. Such men concentrate their whole power and their whole knowledge upon one limited field, in which, therefore, on condition of remaining in entire ignorance of everything else, they can attain to the most complete knowledge possible; while the philosopher must survey all fields of knowledge, and indeed to a certain extent be at home in them; and thus that complete knowledge which can only be attained by the study of detail is necessarily denied him. Therefore the former may be compared to*] <u>like</u> those Geneva workmen of whom one makes only wheels, another only springs, and a third only chains. The philosopher, on the other hand, is like the watchmaker, who alone produces a whole out of all these [*which has motion and significance*]."[2] Thus Schopenhauer makes fun of his "predominantly empirical and historical age." Let's hope in future he doesn't meet up with us as well!

The four-fold Schopenhauer way nonetheless permits one of the foursome to be granted to every discipline. In their relation to *Technik* we do not need to linger with the first two, the principles of sufficient reason of being and knowing. The principles of sufficient reason of becoming [i.e., the law of causality][3] and acting require all the more careful consideration. For it is principally their relation to *Technik* and its neighbors that we have to visualize anew before we prepare, after a century of all too blind zeal, to step into a century of higher reason, purified and with our eyes open. According to Schopenhauer the center of gravity for disciplines like technology [sic], astronomy, physiology, and therapy falls in the orbit of causality, while by contrast the center of gravity for disciplines like ethics, psychology, politics, and history fall in the orbit of motivations. Why?

In a thousand instances Schopenhauer stresses the uniformity of his metaphysics, which in contrast to Plato, Aristotle, Rousseau, et al. assumes no dualism of an inner drive through will and an external one through causes, but always and everywhere a common "principle of motion." For him the world is divided into "only empirical, only a posteriori" observable wills and the "a priori determinable" sum of perceptions [*Vorstellungen*] (mere phenomena). The will, the "thing in itself," is that "unknown x that is left over in all causal explanation," that "true medium" of events from the lowest inorganic to the highest organic, the human level where it is "intimately and directly known": in us the natural forces are identical to the will. And in the total association of phenomena from above to below the essence of perception, causality, is just as identical, whether it manifests itself in the wake

[1] [Arthur Schopenhauer, *Über die vierfache Wurzel des Satzes vom zureichenden Grunde* [*On the fourfold root of the principle of sufficient reason*] (1813), §49 ("On necessity"). (Moellendorff reverses 2) and 3).)]

[2] Schopenhauer, *The World as Will and Idea*, vol. 2, ch. 13. [*Passages in brackets elided by Moellendorff*.]

[3] [The principle of sufficient reason of becoming "figures as the Law of Causality… By it, all objects presenting themselves within the entire range of our representation are linked together, as far as the appearance and disappearance of their states is concerned, i.e. in the movement of the current of Time, to form the complex of empirical reality." §20]

of "mechanical, chemical, and physical causes, a stimulus, an (only) visual motive (in animals), an abstract virtual motive (in humans) …. The old error asserts: where there is will, there is no causality; and where there is causality, there is no will. But we say: wherever there is causality there is will, and no will acts without causality."

How are we to explain that a philosophy that so boldly like Schopenhauer's integrates the universe from the lever to Homo sapiens according to a single system nonetheless differentiates (to single out two domains that concern us: approximately) politics and *Technik* into two different sides of the principle of sufficient reason? I again quote: "causality [is known] entirely from outside, quite indirectly, quite through the understanding; will entirely from inside, quite directly; and that accordingly the clearer the knowledge of the one in each given instance, the less clear is the knowledge of the other. [Therefore] we recognize the essence of the will least readily, where causality is most intelligible [(thence in the inorganic processes lying completely outside us)]; and, where the will is most unmistakably evident [(thence in ourselves)], causality becomes so obscured, that the vulgar mind could venture to deny its existence altogether…[4] Motives belong to causes (like a push or pull or stimulus)....: but here we stand as it were behind the scenes…: Motivation is causality seen from within."[5]

In earlier essays I have communicated that I see three main branches on the tree of social theory, politics as human-to-human relations, economics as human-to-goods, *Technik* as goods-to-goods. Let me here repeat only the result of lengthy considerations and by gesturing toward Schopenhauer thereby illustrate that I mean by "men" in each case real human "subjects," by "goods" however I mean "objects," as which parts of man can sometimes serve well: it is true that we have gotten used to the sloppy manner of speech that since the abolition of slavery "man is man" and as a genuine subject in society disposes over himself freely and alone. But are workers really mistaken if they occasionally characterize themselves as objects of capitalist exploitation? Or are businessmen really deluding themselves if they fear having to become objects of social control in the state of the future? Is it mistaken to speak of *Physiotechnik*—which I prefer to do rather than *Psychotechnik*—as soon as one switches on a person as object to object, like a finger exercise on the piano? No. But in all stages of his moral history man has borne the burden both of the natural bondage resting in the law of causality as well as the pain of the artificial taming of his will caused by social purposes and he must also bear this fate henceforth. So do the borders run between politics and economics as well as between economics and *Technik*.

But whether or not they are already rigid, they do exist. And if we now effortlessly peel away *Technik* as the domain of social theory and care in which causality officiates between objects and objects of human society, for which the principle of sufficient reason of becoming [i.e. the law of causality] holds purely and rigorously, upon which each effect is objectively paired with a cause, in short which may be called the real "kingdom of efficiency," then at the same time we want to pledge never again as at times in the past to organize impermissible invasions in neighboring lands, and be it also only with incautious vocabularies or fleeting analogical inferences.

The specific quality of the neighboring land, the economy [*Wirtschaft*], consists in the human agent (the subject) being joined to the object, in causality being repressed by its subjective variety (the motivation), and in "values" rather than effects acting as standards. Perhaps a money and credit

[4] [Schopenhauer, *Ueber den Willen in der Natur* (1854), 86-87.]

[5] [Schopenhauer, *Über die vierfache Wurzel*, §43. Moellendorff verges on paraphrase here.]

economy in which "the costs are worth all utilities" should hold, [but] to inoculate [it] with our efficiency concept, that is, to put it mildly, childish; for our "efficiency" amounts to at most one thing, while the economist's "value" amounts to at least one: something like that should be chiseled on all milestones around whose sites "operations" and "businesses" fight. We would rather share the responsibility than scramble irresponsibly after the fame for successes and the blame for failures.

That the incompetent and big-mouthed politicos and economicos who have lured our poor Germany since 1890 into a mammon-like St. Vitus dance are subsequently tempering mechanization [*Technisierung*] as scapegoat, this we want to resist emphatically. Walther Rathenau's "mechanization" [*Mechanisierung*] and Werner Sombart's "capitalization" are synonyms of one and the same development, and they have exposed the core of mechanization sufficiently that we do not have to busy ourselves with the squirrel gnawing around the shell: The population politics of the West was based on a found rational ability [as in "found art"] and it created for itself exactly as much *Technik* as it believed it could reconcile with the equally found romanticism. Too much? At the time the *Technik* serving this was in any case not to blame. Too much "efficiency"? For a philistine shoemaker surely, one who likes a fully serviceable telephone less than a half serviceable one, whom a standardized full automatism pleases less than a sentimental variety of types, whom a useful loading ramp enlightens less than an eclectic gaudy decoration at the train station. On the contrary, not at all for those who can recognize the threatening specter of the final deluge of Europe by America. From Moscow to Washington every child grasps the consistency of progressive mechanization. The raised fingers and ruffled wigs should not frighten us.

[….]

Technik derails first on the black ice of the imprecise terms "labor" and "performance" when it also takes the "laboring and performing" human subject for commensurable with the "laboring and performing" machine, just because the human meter-kilogram is commensurable with the machine one.

[….]

No socialist argument is as feeble as that of the perspiring brow of the proletarian. But likewise no anti-socialist argument of the engineers [*Technikerargument*] is as feeble as that of the gladdening muscle relief [offered by the proper combination of hand and machine]…

Since Taylor – only since Taylor! – we can gaze over the whole. His management [sic] is the first consequential analysis of the interest-wage dispute and the body-spirit dispute in its most important elements, namely in "management" [*Arbeitgeberschaft*, the domain of employers] and "labor" [*Arbeitnehmerschaft*, the domain of employees]. Since then it is dawning on us that we have still not gotten as wonderfully far as liberalism dreamed of: In the colonies there is medieval drudgery despite tolerant legislative passages, at home an accumulation of unworthy duties despite all solemn tones, and that had to end as it did. I prophesied, when Taylor first appeared, that his discovery would force broke capitalists partly toward perfecting automatism, partly toward spinning off new trades, thus cultivating in part the "machine attendants," "fitters," etc. and in part the "expert mechanics," "high-voltage assemblers," etc. and pushing aside the "handymen" and "haulers," etc. Lately America is in fact aiming at this with an uncanny instinctual confidence. We Europeans are perhaps still opportunely lagging behind. Whether we lack direction or get stuck underway for reasons of poverty or prejudice, we will either decide upon depopulation and retreat into pre-capitalism out of revulsion at "Taylorism," which is nothing other than production militarism, or

instead get comfortable with "Taylorism" as an instrument of socialism, and thus for the sake of division of labor we will have to socialize ourselves [i.e. becoming socialist], because man rejects private obedience.

[….]

The objection that, it is not *Technik* but rather some object that has been too immature to be treated in terms of "efficiency," does not hold water. Since when do we engineers hole up under the shelter of exactitude? Is it not justly our pride to toss off a problem using "functional vision"…, sooner than exact meticulousness measures it out in its finest details, sooner than it exposes its last decimal point, sooner than the energetic causes and effects reverberate into the furthest corner from the echo of logical premises and conclusions? Have we become Epigones, that with our drafting and testing [*Versuchen*], calculations and designs, we no longer trust in approximation to causality, but rather expect complete revelations of causality? It is bad enough when we produce no more Taylors in ourselves. But it is worse if we no longer wanted to produce him in us. He was just a typical engineer, because empty spots in the "efficiency chart" disturbed him more than the paucity of his scholarly know-how. The knowledge of "efficiency" spurred him on to invention, and no circumstance could fetter him.

[….]

Ever since I experienced the horror before and after November 1918, I have been doubly and triply endorsing the engineer's demand for public influence. But I strongly emphasize that we can win exactly as much influence as befits us if we reform ourselves in terms of "efficiency," both toward a pure isolation of the concept as well as toward a strict conscientiousness of its application. The banality that everyone's power is as great as his readiness for responsibility is unanswerable over the long run. The same is true for engineers… The prospect of reward has lured all engineers who are obeying their "efficiency-related" sense of duty like the categorical imperative, and they should not wither under the blight of black marketeering. The memory of our great [war] dead, whose "efficiency-related" creations have long been the nuclei of an organic economy internally, and may soon be externally, should not be vilified either by biased gushing or by indiscriminate cries of hatred. Its opponents spread rumors that *Technik* threatens the human soul, subverts the personality, and corrupts the *Genus humanum*. We are of a different mind, that *Technik*, economically and politically indifferent, as well as nonpartisan in the conflict between *Genus humanum* and *Societas humana*, equally friends with both the Chinese and the Russians in its generalist "efficiency," can become One: by virtue of its "efficiency" it is a barometer of the "degree of value," a tip of the scale of "degree of value," the neutral point in the transmission of social motives. This is what we engineers mean when we demand economics and politics as comrades in one faculty, the Organic. But we do not lust after participation in their current dissipated lifestyle.

Translation: KH